Entergy

Entergy Operations, Inc.
Grand Gulf Nuclear Station
P.O. Box 756
Port Gibson, Mississippi 39150

James Nadeau
Regulatory Assurance Manager
Tel: 601-437-2103

GNRO-2014/00036

April 25, 2014

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

SUBJECT: Grand Gulf Nuclear Station 2013 Annual Radiological Environmental Operating Report (AREOR)
Grand Gulf Nuclear Station, Unit 1
Docket No. 50-416
License No. NPF-29

Dear Sir or Madam:

In accordance with the Grand Gulf Nuclear Station (GGNS) Unit 1 Technical Specification 5.6.2, attached is the Annual Radiological Environmental Operating Report (AREOR) for the period January 1, 2013 through December 31, 2013.

There are no commitments contained in this submittal. If you have any questions or need additional information, please contact Richard Sumrall at 601-437-2115.

Sincerely,

JN/cjb

Attachment: Grand Gulf Nuclear Station 2013 Annual Radiological Environmental Operating Report (AREOR)

cc: (See Next Page)

cc: NRC Senior Resident Inspector
Grand Gulf Nuclear Station
Port Gibson, MS 39150

U. S. Nuclear Regulatory Commission
ATTN: Marc L. Dapas (w/2)
Regional Administrator, Region IV
1600 East Lamar Boulevard
Arlington, TX 76011-4511

U. S. Nuclear Regulatory Commission
ATTN: Mr. Alan Wang, NRR/DORL (w/2)
Mail Stop OWFN 8 B1
Washington, DC 20555-0001

Mr. B. J. Smith
Director, Division of Radiological Health
Mississippi State Department of Health
Division of Radiological Health
3150 Lawson Street
Jackson, MS 39213

Dr. Mary Currier, M.D., M.P.H
State Health Officer
Mississippi Department of Health
P.O. Box 1700
Jackson, MS 39215-1700

Attachment to
GNRO-2014/00036

Grand Gulf Nuclear Station 2013 Annual Radiological Environmental Operating Report (AREOR)

ENTERGY OPERATIONS, INC.
GRAND GULF NUCLEAR STATION

ANNUAL
RADIOLOGICAL ENVIRONMENTAL
OPERATING REPORT

January 1, 2013 - December 31, 2013

J M Lassetter, 3.24.14

Prepared By

L. Ashley, 4/3/14

Reviewed By

Todd Stadler, 4-7-14

Approved By

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

LIST OF ATTACHMENTS

Summary

The Annual Radiological Environmental Operating Report presents data obtained through analyses of environmental samples collected for Grand Gulf Nuclear Station's (GGNS) Radiological Environmental Monitoring Program (REMP) for the period January 1, 2013, through December 31, 2013. This report fulfills the requirements of GGNS Technical Specification 5.6.2.

To supplement the REMP, GGNS personnel installed duplicate TLDs and collected duplicate samples during the reporting period.

Radiological Environmental Monitoring Program

GGNS established the REMP in 1978 prior to the station becoming operational (1985) to provide data on background radiation and radioactivity normally present in the area. GGNS has continued to monitor the environment by sampling air, water, sediment, fish and food products, as well as measuring radiation directly. GGNS also samples milk, if commercial milk production occurs within five miles of the plant.

The REMP includes sampling indicator and control locations within an 18-mile radius of the plant. The REMP utilizes indicator locations near the site to show any increases or buildup of radioactivity that might occur due to station operation and control locations farther away from the site to indicate naturally occurring background radioactivity. GGNS personnel compare indicator results with control and preoperational results to assess any impact GGNS operation might have on the surrounding environment.

In 2013, GGNS personnel collected environmental samples for radiological analysis. The monitoring results for indicator locations when compared to control locations and previous studies show that GGNS has no significant effect on the local environment. The review of 2013 monitoring data, in many cases, showed undetectable radiation levels in the environment and near background levels in potential exposure pathways associated with GGNS.

Harmful Effects or Irreversible Damage

The REMP monitoring did not detect any harmful effects or evidence of irreversible damage in the current year.

Reporting Levels

When averaged over any calendar quarter, no environmental samples equaled or exceeded reporting levels for radioactivity as outlined in Offsite Dose Calculation Manual (ODCM) Specifications Table 6.12.1-2; the analytical results did not trigger any Radiological Monitoring Program Special Reports.

Radioactivity Not Attributable to GGNS

Over previous years, the GGNS REMP detected radioactivity attributable to other sources. These sources included the Chinese nuclear test in 1980 and the accident at the Chernobyl Nuclear Power Plant in 1986. In 2011, the GGNS REMP detected radioactivity released from the Fukushima Dai-ichi Nuclear Power Plant following the March 11, 2011, Tohoku earthquake. In 2013, the GGNS REMP detected no radioactivity attributable to other sources.

Comparison to Federal and State Programs

GGNS personnel compare REMP data to federal and state monitoring programs. Historically, the programs used for comparison included the U.S. Nuclear Regulatory Commission (NRC) Thermoluminescent Dosimeter (TLD) Direct Radiation Monitoring Network and the Mississippi State Department of Health (MSDH), Division of Radiological Health monitoring program.

Although the NRC TLD Network Program was discontinued in 1998, these results compared favorably to those from the GGNS REMP.

The MSDH and the GGNS REMP have similar monitoring requirements. These programs include co-located air sampling and sharing sample media such as water, sediment, fish and food products. Both programs have obtained similar results. The 2013 results of the MSDH monitoring program compared favorably with the GGNS REMP results.

Sample Deviations

- **Milk**

  The GGNS ODCM requires collection of milk samples if there is a commercially available source within 5 miles (8 km) of the plant. In 2013, the REMP did not include milk sampling because no commercial milk production occurred within 5 miles of GGNS. GGNS personnel instead collected vegetation samples to monitor the ingestion pathway, as specified in ODCM Specifications Table 6.12.1-1.

- **Required Lower Limit of Detection (LLD) Values**

  Analytical lower limit of detection (LLD) values required by the ODCM specifications were achieved in 2013 were within the limits for all samples with the following exceptions:

Sample Type Location / Analysis Date	Nuclide
Surface Water MS River Downstream / Gamma 12/19/2013	Iodine - 131 Ba-140 La-140
Surface Water MS River Upstream / Gamma 12/19/2013	Iodine - 131 Ba-140 La-140

Cause was attributed to excess decay between sample collection and analysis. All remaining LLDs were achieved and no plant related nuclides were detected in the 4Q13 samples.

MS River samples are collected quarterly at indicator [downstream] and control [upstream] locations. In addition, an annual sample is collected from an indicator location during a liquid radwaste discharge. For all remaining 2013 MS River samples, LLDs were achieved and no plant related nuclides were detected.

- **Thermoluminescent Dosimeters**

TLDs M-94 and M-99 were retrieved wet in the 3rd quarter. Similarly located TLD data were reviewed and found consistent with previous data, with readings near background.

- **Air Samples**

The following air sample locations had reduced run times due to weather-related power outages or mechanical problems. As described in ODCM Specification Table 6.12.1-1, footnote (a), deviations from the required sampling schedule are permitted due to malfunction of sampling equipment and other legitimate reasons.

Table 1.1 Air Sampling Deviations in 2013

Sample Location	Date In	Date Out	Run Time (Hours)	Out-of-Service (Hours)	Comments
AS-1 PG	3/26/2013	4/2/2013	169.24	0.41	Power outage
AS-7 UH	4/9/2013	4/16/2013	167.04	0.98	Power outage
AS-7 UH	4/30/2013	5/7/2013	165.90	0.67	Power outage
AS-1 PG	6/18/2013	6/25/2013	151.55	13.38	Power outage
AS-1 PG	6/25/2013	7/2/2013	103.32	73.17	Power outage
AS-3 61VA	6/25/2013	7/2/2013	161.90	15.53	Power outage
AS-1 PG	7/2/2013	7/9/2013	93.23	66.22	Power outage
AS-7 UH	8/7/2013	8/13/2013	145.84	2.49	Power outage
AS-7 UH	9/24/2013	10/1/2013	165.70	1.33	Power outage
AS-3 61VA	12/10/2013	12/17/2013	166.77	0.97	Power outage
AS-7 UH	12/17/2013	12/23/2013	144.53	3.05	Power outage

Based on the sample collection period reductions, air samples were collected the following percentages of the available time:

AS-1 PG	98.3%
AS-3 61VA	99.8%
AS-7 UH	99.9%

- **Missed Samples**

All required samples were collected in accordance with REMP requirements. There were no missed samples.

- **Unavailable Results**

GGNS received analytical results in adequate time for inclusion in this report.

Program Modifications

No REMP modifications took place during this sampling period.

Attachments

Attachment 1 contains results of TLD, air, water, sediment, fish, food products and special samples collected in the reporting period. TLDs were analyzed by Stanford Dosimetry of Sterling, MA. Other samples were analyzed by GEL Laboratories, LLC of Charleston, SC. Attachment 1 includes results from Stanford Dosimetry's and GEL's participation in interlaboratory comparison programs.

1.0 Introduction

1.1 Radiological Environmental Monitoring Program

GGNS established the REMP to ensure that plant operating controls properly function to minimize any radiation that could endanger human health or the environment. The REMP is designed to:

- Analyze important pathways for anticipated types and quantities of radionuclides released into the environment,
- Consider the possibility of a buildup of long-lived radionuclides in the environment and identify any physical and biological accumulations that may contribute to human exposures,
- Consider the potential radiation exposure to plant and animal life in the environment surrounding GGNS,
- Correlate levels of radiation and radioactivity in the environment with radioactive releases from the operation of GGNS.

1.2 Pathways Monitored

The airborne, direct radiation, waterborne and ingestion pathways, as seen in Figure 1-1 are monitored as required by the GGNS ODCM Table 6.12.1-1. A description of the GGNS REMP utilized to monitor the exposure pathways is provided in Table 1.1 and shown in Figures 1-2 and 1-3. GGNS may supplement this program with additional sampling in order to provide a comprehensive and well-balanced program.

Section 2.0 of this report provides a discussion of sampling results, with Section 3.0 providing a summary of results for the monitored exposure pathways.

1.3 Land Use Census

GGNS personnel conduct a biennial land use census, as required by ODCM Specification 6.12.2. The most recent land use census data are included in Table 2.1. The purpose of this census is to identify land use changes within each of the 16 meteorological sectors and within a 5-mile radius of GGNS that would require modifications to the REMP or the ODCM. The purpose of the census is to identify the nearest:

1) Occupied and unoccupied residences
2) Garden of greater than 50 square meters (m^2) [500 square feet (ft^2)] producing broadleaf vegetation
3) Animal milked for human consumption

GGNS personnel conduct the land use census by:

- Conducting field surveys in each meteorological sector out to five miles in order to confirm:
    - Nearest occupied residence
    - Nearest unoccupied residence
    - Nearest garden and approximate size
    - Nearest milking animal
- Identifying locations on maps and aerial photographs, measuring distances to GGNS and recording results on surveillance data sheets
- Comparing current land use census results to previous results from the 2010 census
- Contacting the Claiborne County Agent for verification of nearest dairy animals

No significant differences were observed between the biennial land use censuses performed in 2010 and 2012.

Table 1.2
Radiological Environmental Sampling Program

Exposure Pathway	Requirement	Sample Point Description, Distance and Direction	Sampling and Collection Frequency	Type and Frequency Of Analyses
Airborne	**Radioiodine and Particulates** 1 sample close to the SITE BOUNDARY having the highest calculated annual average ground level D/Q.	**AS-7 UH (Sector H, Radius 0.5 Miles)** – South-southeast of GGNS at the IBEW Union Hall.	Continuous sampler operation with sample collection per 7 days or as required by dust loading, whichever is more frequent	Radioiodine Canister – I-131; 7 days Particulate Sampler – Gross beta radioactivity following filter change, composite (by location) for gamma isotopic; 92 days
	Radioiodine and Particulates 1 sample from the vicinity of a community having the highest calculated annual average ground level D/Q.	**AS-1 PG (Sector G, Radius 5.5 Miles)** – Southeast of GGNS at the Port Gibson City Barn.		
	Radioiodine and Particulates 1 sample from a control location 15 -30 km (10 - 20 miles) distance.	**AS-3 61VA (Sector B, Radius 18 Miles)** – North-northeast of GGNS on Hwy 61, North of the Vicksburg Airport.		
Direct Radiation	**TLDs** An inner ring of stations in the general areas of the SITE BOUNDARY.	**M-16 (Sector A, Radius 0.9 Miles)** – Meteorological Tower. **M-19 (Sector E, Radius 0.5 Miles)** – Eastern SITE BOUNDARY Property line, North-northeast of HWSA.	92 days	Gamma dose; 92 days

Table 1.1
Radiological Environmental Sampling Program

Exposure Pathway	Requirement	Sample Point Description, Distance and Direction	Sampling and Collection Frequency	Type and Frequency Of Analyses
Direct Radiation	**TLDs** An inner ring of stations in the general areas of the SITE BOUNDARY.	**M-21 (Sector J, Radius 0.4 Miles)** – Near Former Training Center Building on Bald Hill Road. **M-22 (Sector G, Radius 0.5 Miles)** – Former RR Entrance Crossing On Bald Hill Road. **M-23 (Sector Q, Radius 0.5 Miles)** – Gin Lake Road 50 Yards North of Heavy Haul Road on Power Pole. **M-25 (Sector N, Radius 1.6 Miles)** – Radial Well Number 1. **M-28 (Sector L, Radius 0.9 Miles)** – Bald Hill Road. **M-94 (Sector R, Radius 0.8 Miles)** – Sector R Near Meteorological Tower.	92 days	Gamma dose; 92 days

Table 1.1
Radiological Environmental Sampling Program

Exposure Pathway	Requirement	Sample Point Description, Distance and Direction	Sampling and Collection Frequency	Type and Frequency Of Analyses
Direct Radiation	**TLDs** An inner ring of stations in the general areas of the SITE BOUNDARY.	**M-95 (Sector F, Radius 0.5 mi)** – Spoils Area, fence of old storage area, near entrance gate **M-96 (Sector B, Radius 0.7 mi.)** – North Gate Fence **M-97 (Sector D, Radius 0.8 mi.)** – Grand Gulf Road entrance gate to spoils area **M-98 (Sector H, Radius 0.5 mi.)** – Bald Hill Road, across from Union Hall, in curve **M-99 (Sector K, Radius 0.4 mi.)** – North Fence of old Ball Field near utility pole **M-100 (Sector C, Radius 0.6 mi.)** – Grand Gulf Road	92 days	Gamma dose; 92 days
	TLDs An outer ring approximately 3 to 5 miles from the site.	**M-36 (Sector P, Radius 5.0 Miles)** – Curve on HW 608, Point Nearest GGNS at Power Pole. **M-40 (Sector M, Radius 2.3 Miles)** – Headly Drive, Near River Port Entrance.		

Table 1.1
Radiological Environmental Sampling Program

Exposure Pathway	Requirement	Sample Point Description, Distance and Direction	Sampling and Collection Frequency	Type and Frequency Of Analyses
Direct Radiation	**TLDs** An outer ring approximately 3 to 5 miles from the site.	**M-48 (Sector K, Radius 4.8 Miles)** – 0.4 Miles South on Mont Gomer Road on West Side. **M-49 (Sector H, Radius 4.5 Miles)** – Fork in Bessie Weathers Road/Shaifer Road. **M-50 (Sector B, Radius 5.3 Miles)** – Panola Hunting Club Entrance. **M-55 (Sector D, Radius 5.0 Miles)** – Near Ingelside Karnac Ferry Road/Ashland Road Intersection. **M-57 (Sector F, Radius 4.5 Miles)** – Hwy 61, Behind the Welcome to Port Gibson Sign at Glensdale Subdivision.	92 days	Gamma dose; 92 days
	TLDs 8 stations in special interest areas such as population centers, nearby residences, schools, and in 1 or 2 areas to serve as control stations.	**M-01 (Sector E, Radius 3.5 Miles)** – Across the road from Lake Claiborne Entry Gate. (Special Interest) **M-07 (Sector G, Radius 5.5 Miles)** – AS-1 PG, Port Gibson City Barn. (Special Interest) **M-09 (Sector D, Radius 3.5 Miles)** – Warner Tully Y-Camp. (Special Interest) **M-10 (Sector A, Radius 1.5 Miles)** – Grand Gulf Military Park. (Special Interest)		

Table 1.1
Radiological Environmental Sampling Program

Exposure Pathway	Requirement	Sample Point Description, Distance and Direction	Sampling and Collection Frequency	Type and Frequency Of Analyses
Direct Radiation	**TLDs** 8 stations in special interest areas such as population centers, nearby residences, schools, and in 1 or 2 areas to serve as control stations	**M-14 (Sector B, Radius 18.0 Miles)** – AS-3-61VA, Hwy 61, North of Vicksburg Airport. (Control) **M-33 (Sector P, Radius 12.5 Miles)** – Newellton, Louisiana Water Tower. (Special Interest) **M-38 (Sector M, Radius 9.5 Miles)** – Lake Bruin State Park, Entrance Road. (Special Interest) **M-39 (Sector M, Radius 13.0 Miles)** – St. Joseph, Louisiana, Auxiliary Water Tank. (Special Interest)	92 days	Gamma dose; 92 days

Table 1.1
Radiological Environmental Sampling Program

Exposure Pathway	Requirement	Sample Point Description, Distance and Direction	Sampling and Collection Frequency	Type and Frequency Of Analyses
Waterborne	**Surface Water** 1 sample upstream. 1 sample downstream.	**MRUP (Sector R, Radius 1.8 Miles) -** At least 4500 ft upstream of the GGNS discharge point into the Mississippi River to allow adequate mixing of the Mississippi and Big Black Rivers. **MRDOWN (Sector N, Radius 1.6 Miles) -** At least 5000 ft downstream of the GGNS discharge point in the Mississippi River near Radial Well No. 1.	92 days	Gamma isotopic and tritium analyses; 92 days
	1 sample downstream during a Liquid Radwaste Discharge. 1 sample from Outfall 007	**MRDOWN (Sector P, Radius 1.3 Miles)** – Downstream of the GGNS discharge point in the Mississippi River near Radial Well No. 5.	366 days	Gamma isotopic and tritium analyses; 366 days
		OUTFALL 007 (Sector N, Radius 0.2 Miles) – Storm Drain System	31 days	Tritium; 31 days

Table 1.1
Radiological Environmental Sampling Program

Exposure Pathway	Requirement	Sample Point Description, Distance and Direction	Sampling and Collection Frequency	Type and Frequency Of Analyses
Waterborne	**Groundwater** Samples from 2 sources.	**PGWELL (Sector G, Radius 5.0 Miles)** - Port Gibson Wells – Taken from distribution system or one of the five wells. **CONSTWELL (Sector Q, Radius 0.4 Miles)** – GGNS Construction Water Well – Taken from distribution system or the well.	366 days	Gamma isotopic and tritium analyses; 366 days
	Sediment From Shoreline 1 sample from downstream area. 1 sample from upstream area.	**SEDHAM (Sector N, Radius 1.6 Miles)** – Downstream of the GGNS discharge point in the Mississippi River near Hamilton Lake outlet. **SEDCONT (Minimum of 100 yds)** – Upstream of the GGNS discharge point in the Mississippi River.	366 days	Gamma isotopic; 366 days
Ingestion	**Milk** 1 sample from milking animals within 8 km (5 miles) if milk is available commercially. 1 control sample (only if indicator exists) >8 km if milk is available.	Currently, no available milking animals within 8 km of GGNS. **ALCONT (Sector K, Radius 10.5 Miles)** - Located South-southwest of GGNS at Alcorn State University.	92 days when required	Gamma isotopic and I-131; 92 days

Table 1.1
Radiological Environmental Sampling Program

Exposure Pathway	Requirement	Sample Point Description, Distance and Direction	Sampling and Collection Frequency	Type and Frequency Of Analyses
Ingestion	**Fish** 1 sample in vicinity of GGNS discharge point. 1 sample uninfluenced by GGNS discharge.	**FISHDOWN** – Downstream of the GGNS discharge point into the Mississippi River **FISHUP** – Upstream of the GGNS discharge point into the Mississippi River uninfluenced by plant operations.	366 days	Gamma isotopic on edible portion; 366 days
	Food Products 1 sample of broadleaf vegetation grown in one of two different offsite locations with highest anticipated annual average ground level D/Q if milk sampling is not performed. 1 sample of similar vegetation grown 15 – 30 km distant if milk sampling is not performed.	**VEG-J (Sector J, Radius 0.4 Miles)** – South of GGNS near former Training Center on Bald Hill Road. **VEG-CONT (Sector K, Radius 10.5 Miles)** – Alcorn State University south-southwest of GGNS when available, otherwise a location 15-30 km distant.	92 days when available	Gamma isotopic and I-131; 92 days

Figure 1-1

Exposure Pathways

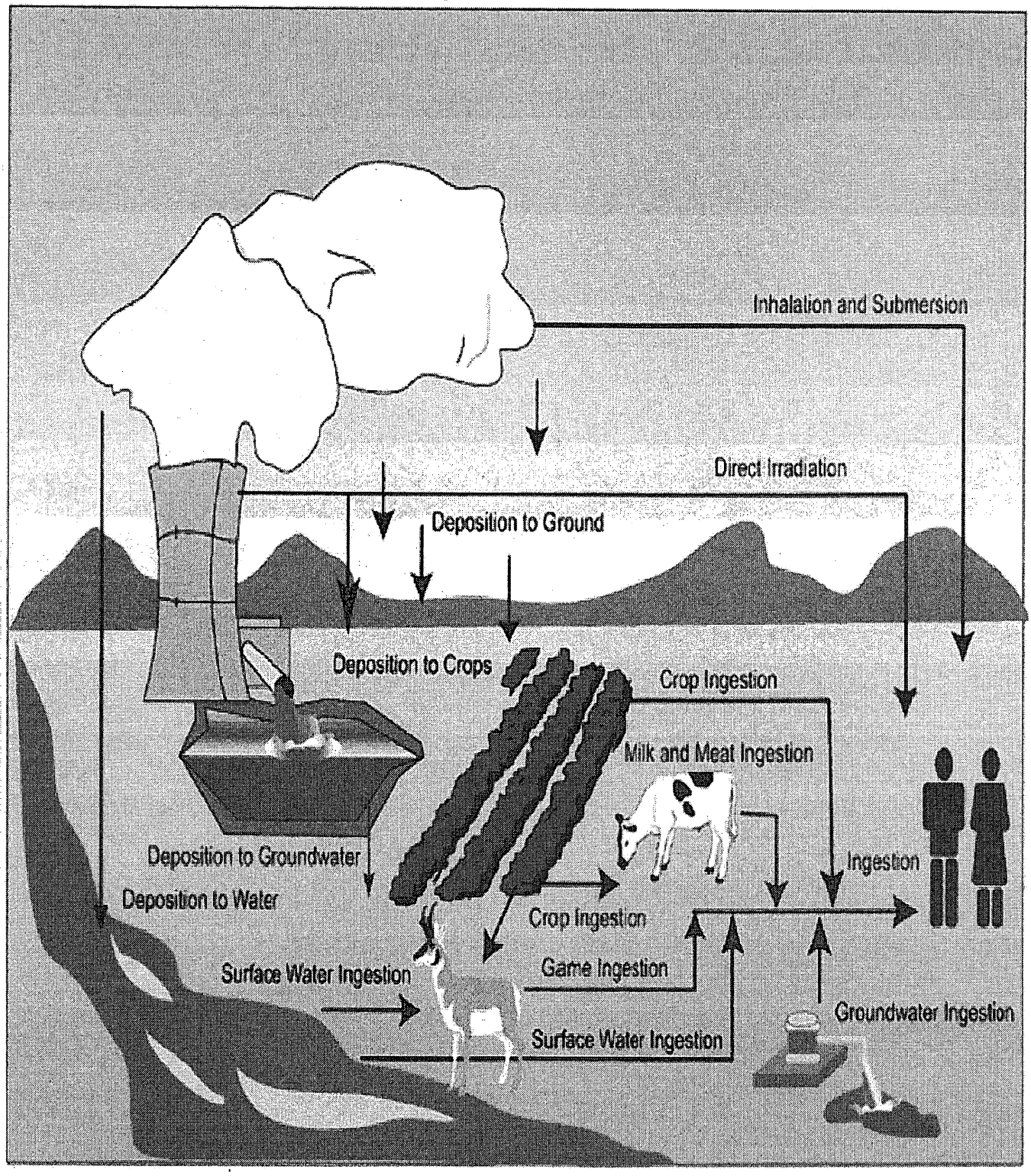


FIGURE 1-2
SAMPLE COLLECTION SITES – NEAR FIELD

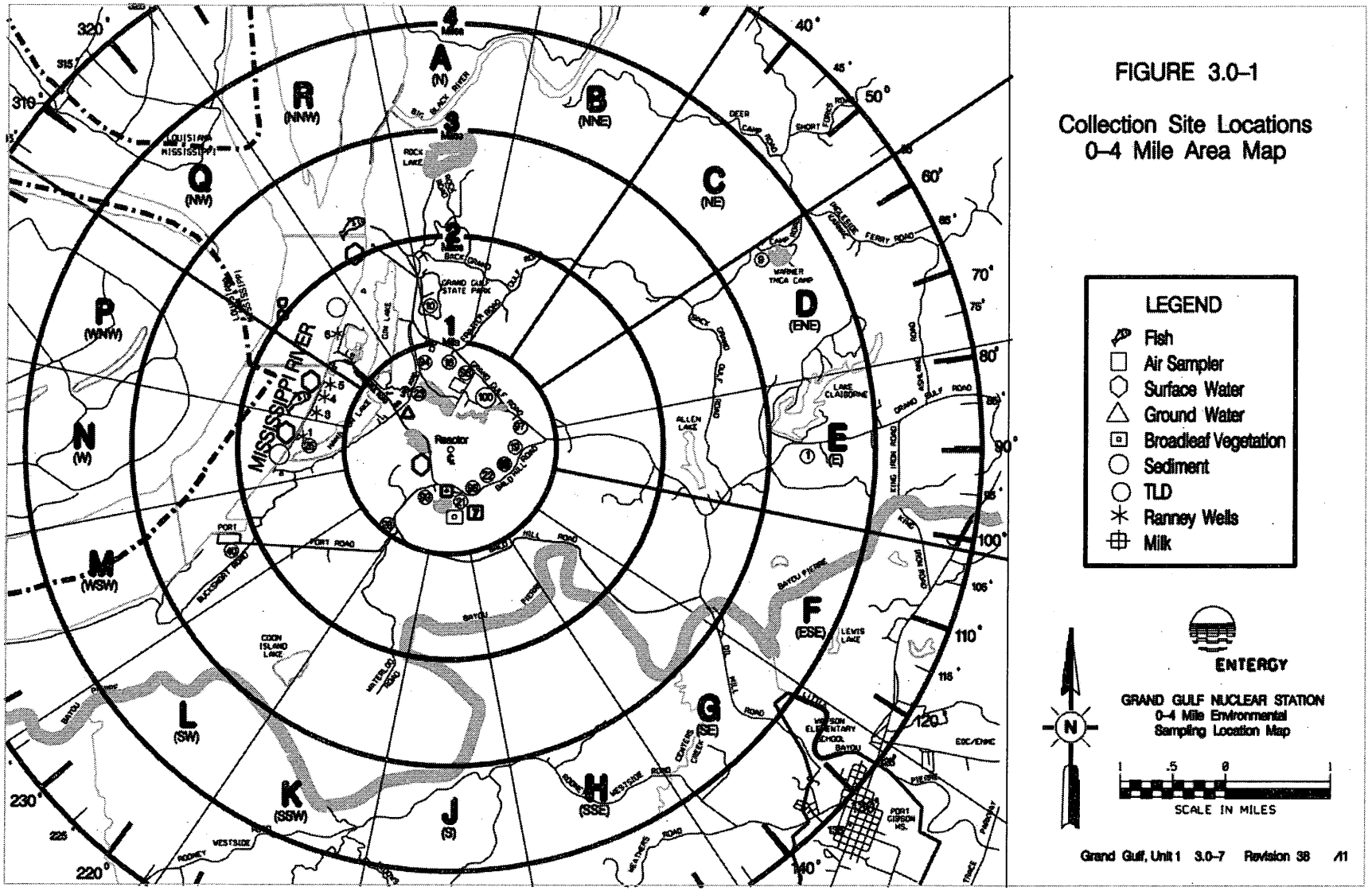
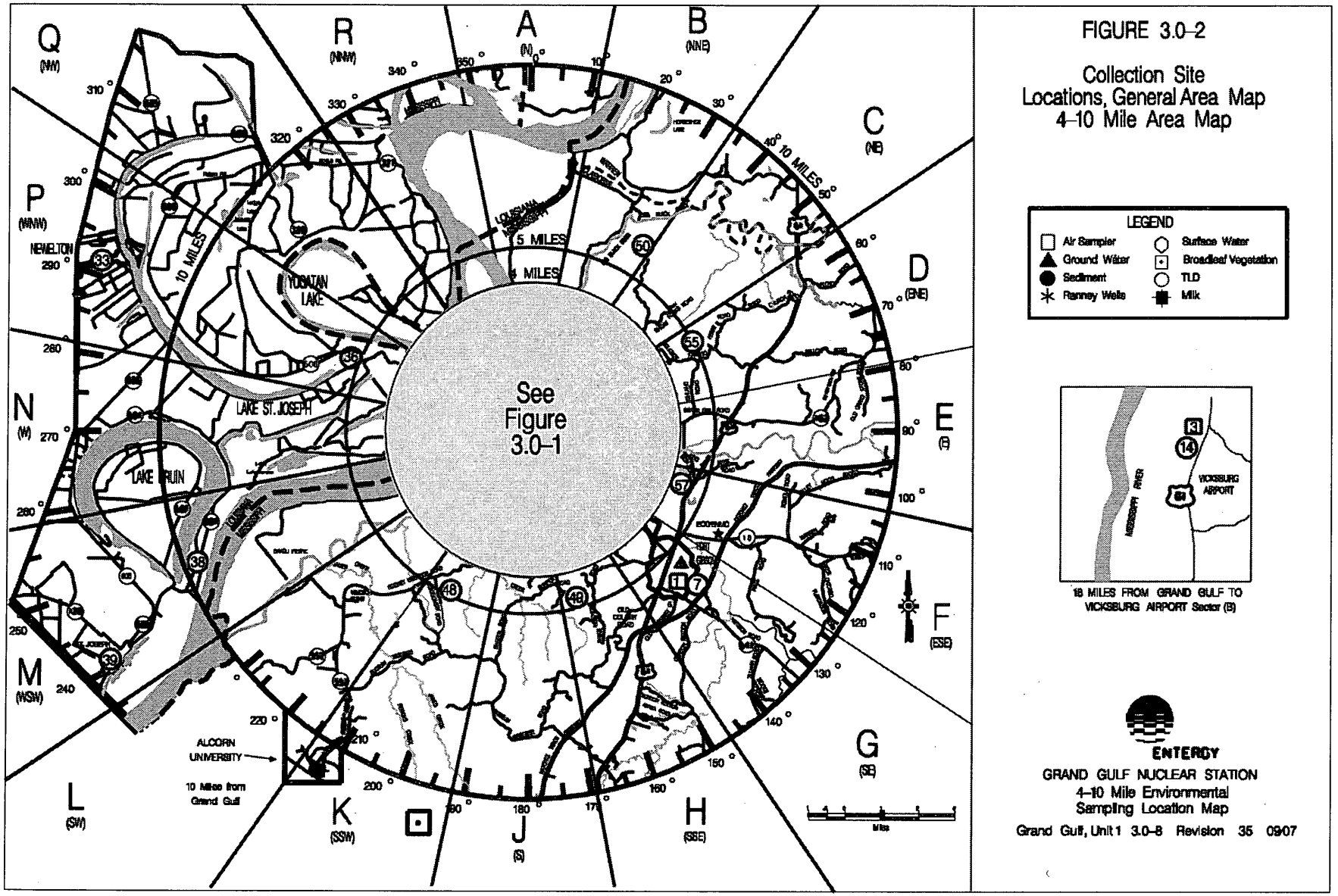


FIGURE 1-3
SAMPLE COLLECTION SITES – FAR FIELD



2.0 Interpretation and Trends of Results

2.1 Air Particulate and Radioiodine Sample Results

GGNS did not detect any plant related gamma emitting radionuclides in the quarterly air particulate composites.

The REMP had previously detected airborne radioactivity attributable to other sources in this pathway. These sources include the Chinese nuclear test in 1980 and the accident at the Chernobyl Nuclear Power Plant in 1986. The GGNS REMP detected radioactivity released from the Fukushima Dai-ichi Nuclear Power Plant following the March 11, 2011, Tohoku earthquake. No radioiodine was detected in 2013.

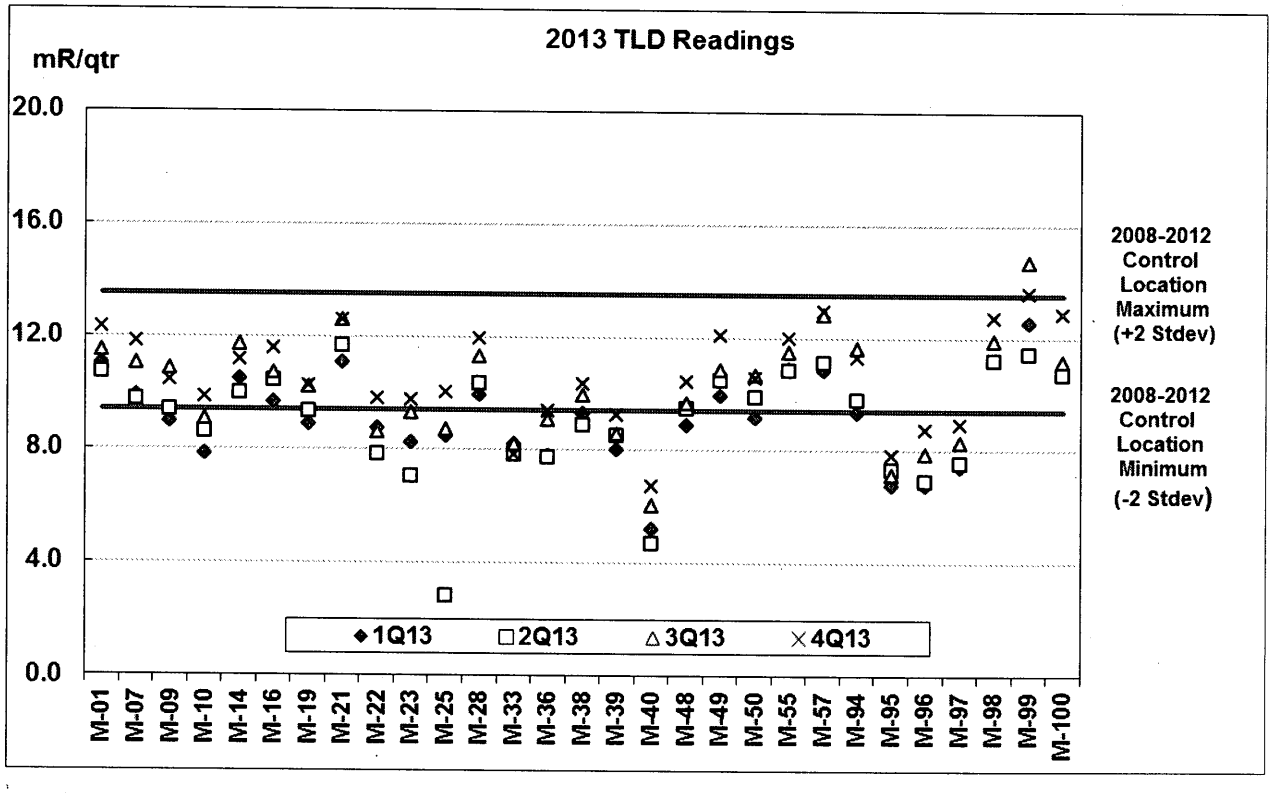
Table 3.1, which also includes gross beta activity, provides a comparison of the indicator and control means and ranges, further emphasizing that the airborne pathway remains at background levels. In the absence of plant-related gamma radionuclides, gross beta activity is attributed to naturally occurring radionuclides. Similar trends are present for control and indicator locations, which support the presence of naturally occurring radioactivity.

2.2 Thermoluminescent Dosimetry Sample Results

GGNS calculates dose by subtracting shield readings from control and indicator location readings and reports measured dose as net exposure, normalized to 92 days. GGNS relies on the comparison of the indicator locations to the control location as an indication of plant impact. Gamma radiation dose in the reporting period is compared to control location readings for previous years as shown in Figure 2-1.

The comparison of the indicator results to the control, and to previous indicator results, as seen in Figure 2-1 and Table 3.1, indicates that plant operation has had no significant impact on ambient radiation levels during the reporting period.

Figure 2-1



2.3 Water Sample Results

Surface water samples were collected from three indicator locations (Outfall 007, MRDOWN, and MRDOWN During Discharge) and one control location (MRUP) and analyzed for gamma emitting radionuclides and tritium. Plant related gamma emitting radionuclides and tritium remained undetectable in the upstream and downstream Mississippi River locations, which is consistent with preoperational and previous operational years. Storm waters contribute to Outfall 007 and can include tritium as a result of washout and entrainment of normal, previously monitored gaseous effluents. As a result, tritium is occasionally observed. In 2013, when detected, tritium was measured at an average concentration of 1817± 444 pCi/L at the Outfall 007 (indicator) location.

In addition to the tritium samples required by the REMP, special surface water samples for gamma emitting radionuclides were collected at the Outfall 007 location (Table A 8.1). Plant related gamma emitting radionuclides remained undetectable in this sample.

Based on review of results and historical data, plant operations had no significant impact on this pathway during the reporting period.

Groundwater samples were collected from two locations (indicator and control) and analyzed for gamma emitting radionuclides and tritium (Tables A 4.2 and A 4.3). In addition to the samples required by the REMP, an extra sample from the indicator location was analyzed for Iodine-131(Table A 4.3). GGNS did not detect any plant related gamma emitting radionuclides or tritium in groundwater samples during the reporting period.

Based on review of results and historical data, plant operations had no significant impact on this pathway during the reporting period.

2.4 Sediment Sample Results

Sediment samples were collected from two locations (indicator and control) and analyzed for gamma emitting radionuclides. In the reporting period, plant related gamma emitting radionuclides were below detectable concentrations in the upstream (control) and downstream (indicator) location.

Based on review of results and historical data, plant operations had no significant impact on this pathway during the reporting period.

2.5 Milk Sample Results

Milk samples were not collected within five miles of the site in the reporting period due to the absence of milking animals. Since there are no dairies within five miles of GGNS, and based on non-detectable radioiodine and gamma radionuclides in air and vegetation samples, plant operations had no impact on this pathway during the reporting period.

2.6 Fish Sample Results

Fish samples were collected from two locations (indicator and control) and analyzed for gamma emitting radionuclides. GGNS did not detect any plant related gamma emitting radionuclides in fish samples (edible portions) during the reporting period, as has been the case in preoperational and previous operational years. These results indicate that this pathway has not been affected by plant operations.

2.7 Food Product (Vegetation) Sample Results

Food product samples were collected from two locations (indicator and control) and analyzed for Iodine-131 and gamma emitting radionuclides. GGNS did not detect any plant related Iodine-131 or gamma emitting radionuclides in vegetation samples during the reporting period. These results indicate that this pathway has not been affected by plant operations.

2.8 Land Use Census Results

Results from the Land Use Census performed in 2012-13 are included in this report. Methods utilized to perform the Land Use Census include: visual surveys, door to door surveys, telephone interviews, Global Positioning System (GPS), Aerial Photography, and consultation with the local county agent concerning dairy production in Claiborne County.

During the survey the following information was obtained:

1) nearest location of occupied and unoccupied residences
2) nearest location of dairy production
3) nearest location of gardens

Changes from the previous Land Use Census were evaluated in accordance with GGNS surveillance "Land Use Census", 06-EN-S000-O-0002. The differences were compared to the locations and assumptions used in calculations for compliance with the ODCM Limiting Condition for Operation 6.11.6. The locations and assumptions currently used in ODCM were determined more conservative than any of the changes. Determinations from the most recent Land Use Census results are:

- Because of downwind location and/or distance from the site, in no case will the occupancy of an existing unoccupied residence cause any existing ODCM critical receptor calculation results to be less conservative.
- No additional sampling locations are required as the onsite vegetation sampling location (Sector J, 0.4 miles) is more conservative than changes identified in the land use census.
- Cattle are raised for human consumption (most notably in Sector H, J, and K). GGNS uses the Grass/Cow/Meat pathway.
- The milk pathway does not need to be activated because no commercial dairy production is occurring within 5 miles, as referenced by ODCM Table 6.12.1-1.
- Sectors M, N, P, and Q are remote areas in which the primary use is hunting. Areas were surveyed by vehicle and aerial photographs.
- Gardens, regardless of size, were included in the census data

Table 2.1
2012 Land Use Census

Parameter		Sector A*	Sector B	Sector C	Sector D*
I. Nearest Occupied Residence	a. Distance (mile) b. Degrees from true north	1.02 355.4	1.51 23.7	0.70 42.3	2.60 60.8
II. Nearest Unoccupied Residence (closer than occupied residence)	a. Distance (mile) b. Degrees from true north	0.94 8.0	0.83 15.1	None	None
III. Nearest Milk Animal	a. Distance	None	None	None	None
IV. Nearest Broadleaf Garden	a. Distance (mile) b. Garden size (ft^2) c. Degrees from true north	None	1.52 ≈ 4050 21.9	0.69[2] ≈ 1250 43.6	3.8 ≈ 800 76.0
V. Census Comparison	a. Is nearest occupied residence in same location as last census? b. Is nearest milk animal in same location as last census? c. Is nearest broadleaf garden in same location as last census?	Yes N/A No	Yes N/A Yes[1]	Yes N/A Yes	Yes N/A No

1- Retained previous garden location. Located no other gardens in Sector B, 2 -Currently not planted. Retained due to potential to plant. Next nearest garden @4.53 mi, 49 degrees ≈200 ft^2, *= Change from last census. See table of Land Use Census Changes

Table 2.1
2012 Land Use Census, continued.

Parameter		Sector E	Sector F*	Sector G*	Sector H
I. Nearest Occupied Residence	a. Distance (miles) b. Degrees from true north	0.86 93.9	2.25 101.3	3.71 131.8	1.10 151.4
II. Nearest Unoccupied Residence (closer than occupied residence)	a. Distance (miles) b. Degrees from true north	None	None	2.10 129.2	1.07 151.0
III. Nearest Milk Animal	a. Distance	None	None	None	None
IV. Nearest Broadleaf Garden	a. Distance (miles) b. Garden size (ft^2) c. Degrees from true north	0.89 ≈1000 86.9	4.81 ≈200 122	3.39 ≈3.2E5[1] 129	4.39 ≈ 200 155
V. Census Comparison	a. Is nearest occupied residence in same location as last census? b. Is nearest milk animal in same location as last census? c. Is nearest broadleaf garden in same location as last census?	Yes N/A Yes	Yes N/A No	No N/A Yes	Yes N/A Yes

1 - Fields plowed, not planted. Next nearest garden 4.93 miles, 128 degrees, ~ 500 ft^2

* - Change from last census. See table of Land Use Census Changes

Table 2.1
2012 Land Use Census, continued.

Parameter		Sector J	Sector K	Sector L	Sector M
I. Nearest Occupied Residence	a. Distance (miles) b. Degrees from true north	3.14 174.2	2.20 197.0	0.89 219.7	None
II. Nearest Unoccupied Residence (closer than occupied residence)	a. Distance (miles) b. Degrees from true north	None	1.70 203.3 (Hunting Lodge-Info Only)	None	None
III. Nearest Milk Animal	a. Distance (miles)	None	None	None	None
IV. Nearest Broadleaf Garden	a. Distance (miles) b. Garden size (ft^2) c. Degrees from true north	3.16 ≈ 500 174.0	2.18 ≈ 2500 196.3	0.89 ≈ 50 219.5	None
V. Census Comparison	a. Is nearest occupied residence in same location as last census? b. Is nearest milk animal in same location as last census? c. Is nearest broadleaf garden in same location as last census?	Yes N/A Yes	Yes N/A Yes	Yes N/A Yes	N/A N/A N/A

Table 2.1
2012 Land Use Census, continued.

Parameter		Sector N	Sector P	Sector Q	Sector R
I. Nearest Occupied Residence	a. Distance (miles) b. Degrees from true north	None	None	None	1.11 346.1
II. Nearest Unoccupied Residence (closer than occupied residence)	a. Distance (miles) b. Degrees from true north	1.58 82.2 (Bucksnort Camp-Info Only)	None	None	None
III. Nearest Milk Animal	a. Distance (miles)	None	None	None	None
IV. Nearest Broadleaf Garden	a. Distance (miles) b. Garden size (ft^2) c. Degrees from true north	None	None	None	None
V. Census Comparison	a. Is nearest occupied residence in same location as last census?	N/A	N/A	N/A	Yes
	b. Is nearest milk animal in same location as last census?	N/A	N/A	N/A	N/A
	c. Is nearest broadleaf garden in same location as last census?	N/A	N/A	N/A	N/A

2012 Land Use Census Changes

SECTOR	PARAMETER	Reason for Change
A	Nearest Broadleaf Garden	No garden at 2010 census location. No other gardens in Sector A.
D	Nearest Broadleaf Garden	No garden at 2010 census location. New garden location identified.
F	Nearest Broadleaf Garden	No garden at 2010 census location. New garden location identified.
G	Nearest Broadleaf Garden	Fields plowed, not planted. Next nearest garden 4.93 miles, 128 degrees, ~ 500 ft^2

2.9 Interlaboratory Comparison Results

Stanford Dosimetry Company analyzed interlaboratory comparison thermoluminescent dosimeters to fulfill the requirements of ODCM Specification 6.12.1. The results are shown in Table A.9.1.

GEL Laboratories analyzed interlaboratory comparison samples to fulfill the requirements of ODCM Specification 6.12.1. The results are shown in Table A.9.2.

3.0 Radiological Environmental Monitoring Program Summary

3.1 Program Results Summary

Table 3.1 summarizes the REMP results. Values reported as less than the lower limit of detection (<LLD) were not used when determining ranges and means for indicator and control locations.

TABLE 3.1

Radiological Environmental Monitoring Program Summary

Name of Facility: Grand Gulf Nuclear Station **Docket No:** 50-416
Location of Facility: Claiborne County, Mississippi **Reporting Period:** January - December 2013

Sample Type (Units)	Type & Number of Analyses [a]	LLD [b]	Indicator Locations Mean (F) [c] [Range]	Location with Highest Annual Mean		Control Locations Mean (F) [c] [Range]	Number of Nonroutine Results [e]
				Location [d]	Mean (F) [c] [Range]		
Air Particulates (pCi/m^3)	GB 159	0.01	0.0383 (106/106) [0.00931 - 0.0858]	AS-1 PG (Sector G, 5.5 mi)	0.0389 (53/53) [0.00931-0.0858]	0.0353 (53/53) [0.0117 - 0.082]	0
	GS 12						
	Cs-134	0.05	<LLD	N/A	N/A	<LLD	0
	Cs-137	0.06	<LLD	N/A	N/A	<LLD	0
Airborne Iodine (pCi/m^3)	I-131 159	0.07	<LLD	N/A	N/A	<LLD	0
Inner Ring TLDs (mR/Qtr)	Gamma 56	f	9.8 (56/56) [2.8 – 14.7]	M-99 (Sector J, 0.4 mi.)	13.1 (4/4) [11.5 – 14.7]	N/A	0
Outer Ring TLDs (mR/Qtr)	Gamma 28	f	9.7 (28/28) [4.7 – 13.0]	M-57 (Sector F, 4.5 mi.)	11.9 (4/4) [10.8 – 13.0]	N/A	0
Special Interest TLDs (mR/Qtr)	Gamma 28	f	9.6 (28/28) [7.8 – 12.3]	M-01 (Sector E, 3.5 mi.)	11.4 (4/4) [10.7 – 12.3]	N/A	0
Control TLDs (mR/Qtr)	Gamma 4	f	N/A	N/A	N/A	10.8 (4/4) [10.0 – 11.7]	0

TABLE 3.1

Radiological Environmental Monitoring Program Summary

Name of Facility: Grand Gulf Nuclear Station **Docket No:** 50-416
Location of Facility: Claiborne County, Mississippi **Reporting Period:** January - December 2013

Sample Type (Units)	Type & Number of Analyses [a]	LLD [b]	Indicator Location Mean (F) [c] [Range]	Location with Highest Annual Mean		Control Locations Mean (F) [c] [Range]	Number of Nonroutine Results [e]
				Location [d]	Mean (F) [c] [Range]		
Surface Water (pCi/l)	H-3 34	3000	1817 (6/27) [508 – 5140]	Outfall 007 (Sector N, Radius 0.2 mi.)	1817 (6/18) [508 – 5140]	<LLD	0
	GS 16						
	I-131	15	<LLD	N/A	N/A	<LLD	0
	Mn-54	15	<LLD	N/A	N/A	<LLD	0
	Fe-59	30	<LLD	N/A	N/A	<LLD	0
	Co-58	15	<LLD	N/A	N/A	<LLD	0
	Co-60	15	<LLD	N/A	N/A	<LLD	0
	Zn-65	30	<LLD	N/A	N/A	<LLD	0
	Zr-95	30	<LLD	N/A	N/A	<LLD	0
	Nb-95	15	<LLD	N/A	N/A	<LLD	0
	Cs-134	15	<LLD	N/A	N/A	<LLD	0
	Cs-137	18	<LLD	N/A	N/A	<LLD	0
	Ba-140	60	<LLD	N/A	N/A	<LLD	0
	La-140	15	<LLD	N/A	N/A	<LLD	0

TABLE 3.1

Radiological Environmental Monitoring Program Summary

Name of Facility: Grand Gulf Nuclear Station **Docket No:** 50-416
Location of Facility: Claiborne County, Mississippi **Reporting Period:** January - December 2013

Sample Type (Units)	Type & Number of Analyses [a]	LLD [b]	Indicator Locations Mean (F) [c] [Range]	Location with Highest Annual Mean		Control Locations Mean (F) [c] [Range]	Number of Nonroutine Results [e]
				Location [d]	Mean (F) [c] [Range]		
Groundwater (pCi/1)	H-3 6	2000	<LLD	N/A	N/A	<LLD	0
	I-131 4	1	<LLD	N/A	N/A	<LLD	0
	GS 3						
	Mn-54	15	<LLD	N/A	N/A	<LLD	0
	Fe-59	30	<LLD	N/A	N/A	<LLD	0
	Co-58	15	<LLD	N/A	N/A	<LLD	0
	Co-60	15	<LLD	N/A	N/A	<LLD	0
	Zn-65	30	<LLD	N/A	N/A	<LLD	0
	Zr-95	30	<LLD	N/A	N/A	<LLD	0
	Nb-95	15	<LLD	N/A	N/A	<LLD	0
	Cs-134	15	<LLD	N/A	N/A	<LLD	0
	Cs-137	18	<LLD	N/A	N/A	<LLD	0
	Ba-140	60	<LLD	N/A	N/A	<LLD	0
	La-140	15	<LLD	N/A	N/A	<LLD	0
Sediment (pCi/kg)	GS 4						
	Cs-134	150	<LLD	N/A	N/A	<LLD	0
	Cs-137	180	<LLD	N/A	N/A	<LLD	0

TABLE 3.1

Radiological Environmental Monitoring Program Summary

Name of Facility: Grand Gulf Nuclear Station **Docket No:** 50-416
Location of Facility: Claiborne County, Mississippi **Reporting Period:** January - December 2013

Sample Type (Units)	Type & Number of Analyses [a]	LLD [b]	Indicator Location Mean (F) [c] [Range]	Location with Highest Annual Mean		Control Locations Mean (F) [c] [Range]	Number of Nonroutine Results [e]
				Location [d]	Mean (F) [c] [Range]		
Fish (pCi/kg)	GS 2						
	Mn-54	130	<LLD	N/A	N/A	<LLD	0
	Fe-59	260	<LLD	N/A	N/A	<LLD	0
	Co-58	130	<LLD	N/A	N/A	<LLD	0
	Co-60	130	<LLD	N/A	N/A	<LLD	0
	Zn-65	260	<LLD	N/A	N/A	<LLD	0
	Cs-134	130	<LLD	N/A	N/A	<LLD	0
	Cs-137	150	<LLD	N/A	N/A	<LLD	0
Food Products/Vegetation (pCi/kg)	I-131 8	60	<LLD	N/A	N/A	<LLD	0
	GS 8						
	Cs-134	60	<LLD	N/A	N/A	<LLD	0
	Cs-137	80	<LLD	N/A	N/A	<LLD	0

TABLE 3.1

Radiological Environmental Monitoring Program Summary

Name of Facility: Grand Gulf Nuclear Station **Docket No:** 50-416
Location of Facility: Claiborne County, Mississippi **Reporting Period:** January - December 2013

Sample Type (Units)	Type & Number of Analyses [a]	LLD [b]	Indicator Location Mean (F) [c] [Range]	Location with Highest Annual Mean		Control Locations Mean (F) [c] [Range]	Number of Nonroutine Results [e]
				Location [d]	Mean (F) [c] [Range]		
Surface Water (Special) (pCi/l)	GS 2						
	I-131	15	<LLD	N/A	N/A	<LLD	0
	Mn-54	15	<LLD	N/A	N/A	<LLD	0
	Fe-59	30	<LLD	N/A	N/A	<LLD	0
	Co-58	15	<LLD	N/A	N/A	<LLD	0
	Co-60	15	<LLD	N/A	N/A	<LLD	0
	Zn-65	30	<LLD	N/A	N/A	<LLD	0
	Zr-95	30	<LLD	N/A	N/A	<LLD	0
	Nb-95	15	<LLD	N/A	N/A	<LLD	0
	Cs-134	15	<LLD	N/A	N/A	<LLD	0
	Cs-137	18	<LLD	N/A	N/A	<LLD	0
	Ba-140	60	<LLD	N/A	N/A	<LLD	0
	La-140	15	<LLD	N/A	N/A	<LLD	0

[a] GB = Gross beta; I-131 = Iodine-131; H-3 = Tritium; GS = Gamma scan.

[b] LLD = Required lower limit of detection based on ODCM Table 6.12.1-3.

[c] Mean and range based upon detectable measurements only. Fraction of detectable measurements at specified locations is indicated in parenthesis (F).

[d] Where applicable, locations are specified by name, distance from reactor site and meteorological sector.

[e] Non-routine results are those which exceed ten times the control station value. If no control station value is available, the result is considered non-routine if it exceeds ten times the preoperational value for the location.

[f] LLD is not defined in ODCM Table 6.12.1-3.

Attachment 1

Radiological Monitoring Report

Summary of Monitoring Results

TABLE OF CONTENTS

Table A1.1

Sample Type: Air Particulate Filter and Radioiodine Cartridge

Analysis: Gross Beta and I-131

Units: pCi/m3

AIR SAMPLE AS-1 PG

LLD (pCi/m3)			0.07	0.01	
LAB ID	START DATE	END DATE	I-131	GROSS BETA	
317430004	12/26/2012	1/1/2013	<0.0153	0.04270	+/-0.00627
318220004	1/1/2013	1/8/2013	< 0.0134	0.06982	+/-0.00742
318693004	1/8/2013	1/15/2013	< 0.0191	0.01534	+/-0.00357
319091004	1/15/2013	1/22/2013	< 0.0202	0.03304	+/-0.00501
319533004	1/22/2013	1/29/2013	< 0.0349	0.05355	+/-0.00649
320026004	1/29/2013	2/5/2013	< 0.0245	0.03471	+/-0.00524
320346004	2/5/2013	2/12/2013	< 0.014	0.02636	+/-0.00451
320840004	2/12/2013	2/19/2013	< 0.0341	0.02963	+/-0.00487
321113004	2/19/2013	2/26/2013	< 0.0344	0.03378	+/-0.00518
321567004	2/26/2013	3/5/2013	< 0.0174	0.04998	+/-0.00623
321999004	3/5/2013	3/12/2013	< 0.0419	0.03904	+/-0.00559
322324004	3/12/2013	3/19/2013	< 0.0143	0.04448	+/-0.00592
322636004	3/19/2013	3/26/2013	< 0.0181	0.03038	+/-0.00494
322943004	3/26/2013	4/2/2013	< 0.00796	0.02571	+/-0.00454
323665004	4/2/2013	4/9/2013	< 0.0526	0.02936	+/-0.00487
324144004	4/9/2013	4/16/2013	< 0.0181	0.02592	+/-0.00456
324469004	4/16/2013	4/23/2013	< 0.0179	0.02047	+/-0.00407
324861004	4/23/2013	4/30/2013	< 0.0318	0.03236	+/-0.00502
325429004	4/30/2013	5/7/2013	< 0.0236	0.01805	+/-0.00387
325878004	5/7/2013	5/14/2013	< 0.0309	0.02938	+/-0.0048
326479004	5/14/2013	5/21/2013	< 0.0182	0.04142	+/-0.00573
326691004	5/21/2013	5/28/2013	< 0.0256	0.02691	+/-0.00469
327221004	5/28/2013	6/4/2013	< 0.0191	0.009312	+/-0.00295
327463004	6/4/2013	6/11/2013	< 0.0182	0.02678	+/-0.00463
327873004	6/11/2013	6/18/2013	< 0.0211	0.04001	+/-0.00558
328379004	6/18/2013	6/25/2013	< 0.0429	0.03116	+/-0.00528
328785004	6/25/2013	7/2/2013	< 0.028	0.05135	+/-0.00818
329309004	7/2/2013	7/9/2013	< 0.0441	0.02698	+/-0.00641
329922004	7/9/2013	7/17/2013	< 0.019	0.02374	+/-0.00408
330259004	7/17/2013	7/23/2013	< 0.0453	0.01888	+/-0.00424
330702004	7/23/2013	7/30/2013	< 0.0392	0.03411	+/-0.00522
331148004	7/30/2013	8/7/2013	< 0.0324	0.07807	+/-0.00732
331513004	8/7/2013	8/13/2013	< 0.0178	0.03988	+/-0.00595
332043004	8/13/2013	8/20/2013	< 0.0236	0.04118	+/-0.0058
332352004	8/20/2013	8/27/2013	< 0.0281	0.0411	+/-0.00569

Table A1.1

Sample Type: Air Particulate Filter and Radioiodine Cartridge

Analysis: Gross Beta and I-131

Units: pCi/m3

AIR SAMPLE AS-1 PG

LLD (pCi/m3)			0.07	0.01	
LAB ID	START DATE	END DATE	I-131	GROSS BETA	
332754004	8/27/2013	9/3/2013	< 0.0195	0.06038	+/-0.0068
333162004	9/3/2013	9/10/2013	< 0.0112	0.06962	+/-0.00742
333707004	9/10/2013	9/17/2013	< 0.0304	0.08584	+/-0.00814
334027004	9/17/2013	9/24/2013	< 0.0147	0.03424	+/-0.00527
334492004	9/24/2013	10/1/2013	< 0.0155	0.0469	+/-0.00606
335178004	10/1/2013	10/8/2013	< 0.0108	0.02479	+/-0.00447
335658004	10/8/2013	10/15/2013	< 0.0239	0.04288	+/-0.00583
336215004	10/15/2013	10/23/2013	< 0.0192	0.08291	+/-0.00761
336629004	10/23/2013	10/29/2013	< 0.0278	0.05765	+/-0.00655
336940004	10/29/2013	11/5/2013	< 0.021	0.03995	+/-0.00527
337429004	11/5/2013	11/12/2013	< 0.0222	0.03774	+/-0.005
337901004	11/12/2013	11/19/2013	< 0.0228	0.02484	+/-0.00413
338351004	11/19/2013	11/26/2013	< 0.0301	0.03267	+/-0.00476
338574004	11/26/2013	12/3/2013	< 0.0179	0.04077	+/-0.00522
339246004	12/3/2013	12/10/2013	< 0.0151	0.02432	+/-0.00406
339504004	12/10/2013	12/17/2013	< 0.0229	0.05727	+/-0.00621
339922004	12/17/2013	12/23/2013	< 0.0195	0.03617	+/-0.00531
340141001	12/23/2013	12/31/2013	< 0.0202	0.04808	+/-0.00532
Average:				0.0389	
Maximum:				0.0858	
Minimum:				0.00931	

Table A1.2
Sample Type: Air Particulate Filter and Radioiodine Cartridge
Analysis: Gross Beta and I-131
Units: pCi/m3
AIR SAMPLE AS-3 61VA

LLD (pCi/m3) LAB ID	START DATE	END DATE	0.07 I-131	0.01 GROSS BETA	
317430005	12/25/2012	1/1/2013	<0.0112	0.04720	+/-0.00610
318220005	1/1/2013	1/8/2013	< 0.0378	0.08197	+/-0.00807
318693005	1/8/2013	1/15/2013	< 0.0218	0.02639	+/-0.00458
319091005	1/15/2013	1/22/2013	< 0.0165	0.04091	+/-0.00555
319533005	1/22/2013	1/29/2013	< 0.0231	0.05567	+/-0.00661
320026005	1/29/2013	2/5/2013	< 0.0268	0.03535	+/-0.00529
320346002	2/5/2013	2/12/2013	< 0.025	0.03414	+/-0.00518
320840005	2/12/2013	2/19/2013	< 0.0214	0.02683	+/-0.00463
321113005	2/19/2013	2/26/2013	< 0.0296	0.03419	+/-0.00523
321567005	2/26/2013	3/5/2013	< 0.0216	0.04546	+/-0.00599
321999005	3/5/2013	3/12/2013	< 0.0207	0.04485	+/-0.00598
322324005	3/12/2013	3/19/2013	< 0.0177	0.03544	+/-0.0053
322636005	3/19/2013	3/26/2013	< 0.0263	0.03362	+/-0.00518
322943005	3/26/2013	4/2/2013	< 0.00882	0.03311	+/-0.00515
323665005	4/2/2013	4/9/2013	< 0.0295	0.03495	+/-0.00526
324144005	4/9/2013	4/16/2013	< 0.0165	0.02572	+/-0.00454
324469005	4/16/2013	4/23/2013	< 0.0202	0.037	+/-0.0054
324861005	4/23/2013	4/30/2013	< 0.0205	0.03447	+/-0.00517
325429005	4/30/2013	5/7/2013	< 0.0321	0.01589	+/-0.00365
325878005	5/7/2013	5/14/2013	< 0.0364	0.02614	+/-0.00454
326479005	5/14/2013	5/21/2013	< 0.0212	0.04895	+/-0.00627
326691005	5/21/2013	5/28/2013	< 0.0195	0.02709	+/-0.00456
327221005	5/28/2013	6/4/2013	< 0.018	0.01172	+/-0.00325
327463005	6/4/2013	6/11/2013	< 0.025	0.02144	+/-0.00417
327873005	6/11/2013	6/18/2013	< 0.0179	0.02819	+/-0.0047
328379005	6/18/2013	6/25/2013	< 0.0267	0.02505	+/-0.00457
328785005	6/25/2013	7/2/2013	< 0.0237	0.02683	+/-0.00474
329309005	7/2/2013	7/9/2013	< 0.0246	0.01892	+/-0.00408
329922005	7/9/2013	7/16/2013	< 0.0277	0.02435	+/-0.00428
330259005	7/16/2013	7/23/2013	< 0.0282	0.01792	+/-0.00395
330702005	7/23/2013	7/30/2013	< 0.0236	0.02527	+/-0.00453
331148005	7/30/2013	8/7/2013	< 0.0238	0.05505	+/-0.00613
331513005	8/7/2013	8/13/2013	< 0.0201	0.02216	+/-0.00448
332043005	8/13/2013	8/20/2013	< 0.0167	0.0314	+/-0.00508
332352005	8/20/2013	8/27/2013	< 0.0287	0.02768	+/-0.0047

Table A1.2
Sample Type: Air Particulate Filter and Radioiodine Cartridge
Analysis: Gross Beta and I-131
Units: pCi/m3
AIR SAMPLE AS-3 61VA

LLD (pCi/m3)			0.07	0.01	
LAB ID	START DATE	END DATE	I-131	GROSS BETA	
332754005	8/27/2013	9/3/2013	< 0.0246	0.05089	+/-0.00632
333162005	9/3/2013	9/10/2013	< 0.0186	0.05877	+/-0.00684
333707005	9/10/2013	9/17/2013	< 0.0259	0.06597	+/-0.00701
334027005	9/17/2013	9/24/2013	< 0.0126	0.03106	+/-0.00507
334492005	9/24/2013	10/1/2013	< 0.0108	0.04255	+/-0.00585
335178005	10/1/2013	10/8/2013	< 0.0108	0.01959	+/-0.00401
335658005	10/8/2013	10/15/2013	< 0.0226	0.03802	+/-0.00546
336215005	10/15/2013	10/22/2013	< 0.0168	0.03855	+/-0.00555
336629005	10/22/2013	10/29/2013	< 0.0197	0.03752	+/-0.0049
336940005	10/29/2013	11/5/2013	< 0.0263	0.03991	+/-0.00527
337429005	11/5/2013	11/12/2013	< 0.0112	0.03691	+/-0.00497
337901005	11/12/2013	11/19/2013	< 0.0312	0.02327	+/-0.00398
338351005	11/19/2013	11/26/2013	< 0.0245	0.03474	+/-0.00491
338574005	11/26/2013	12/3/2013	< 0.0281	0.0355	+/-0.00487
339246005	12/3/2013	12/10/2013	< 0.0176	0.02436	+/-0.00407
339504005	12/10/2013	12/17/2013	< 0.00971	0.05143	+/-0.00591
339922005	12/17/2013	12/23/2013	< 0.0261	0.03729	+/-0.00537
340141005	12/23/2013	12/31/2013	< 0.0171	0.04411	+/-0.00512
Average:				0.0353	
Maximum:				0.082	
Minimum:				0.0117	

Table A1.3

Sample Type: Air Particulate Filter and Radioiodine Cartridge

Analysis: Gross Beta and I-131

Units: pCi/m3

AIR SAMPLE AS-7 UH

LLD (pCi/m3) LAB ID	START DATE	END DATE	0.07 I-131	0.01 GROSS BETA	
317430006	12/25/2012	1/1/2013	<0.0155	0.04710	+/-0.00609
318220006	1/1/2013	1/8/2013	< 0.0147	0.07105	+/-0.00748
318693006	1/8/2013	1/15/2013	< 0.0227	0.02232	+/-0.00426
319091006	1/15/2013	1/22/2013	< 0.0176	0.04115	+/-0.00557
319533006	1/22/2013	1/29/2013	< 0.0282	0.05841	+/-0.00678
320026006	1/29/2013	2/5/2013	< 0.0158	0.04472	+/-0.00593
320346006	2/5/2013	2/12/2013	< 0.0257	0.02855	+/-0.00473
320840006	2/12/2013	2/19/2013	< 0.0355	0.02877	+/-0.00483
321113006	2/19/2013	2/26/2013	< 0.0351	0.03011	+/-0.0049
321567006	2/26/2013	3/5/2013	< 0.0202	0.03799	+/-0.00549
321999006	3/5/2013	3/12/2013	< 0.0175	0.03918	+/-0.0056
322324006	3/12/2013	3/19/2013	< 0.0275	0.0379	+/-0.00547
322636006	3/19/2013	3/26/2013	< 0.0198	0.04151	+/-0.00574
322943006	3/26/2013	4/2/2013	< 0.00913	0.03085	+/-0.00498
323665006	4/2/2013	4/9/2013	< 0.0251	0.03625	+/-0.00535
324144006	4/9/2013	4/16/2013	< 0.0191	0.02567	+/-0.00455
324469006	4/16/2013	4/23/2013	< 0.0231	0.03104	+/-0.00496
324861006	4/23/2013	4/30/2013	< 0.0309	0.0385	+/-0.00548
325429006	4/30/2013	5/7/2013	< 0.0275	0.01914	+/-0.00397
325878006	5/7/2013	5/14/2013	< 0.0291	0.03941	+/-0.00553
326479006	5/14/2013	5/21/2013	< 0.0124	0.04657	+/-0.00594
326691006	5/21/2013	5/28/2013	< 0.0204	0.03007	+/-0.00494
327221006	5/28/2013	6/4/2013	< 0.0188	0.01234	+/-0.00332
327463006	6/4/2013	6/11/2013	< 0.0176	0.02891	+/-0.0048
327873006	6/11/2013	6/18/2013	< 0.0248	0.04112	+/-0.00566
328379006	6/18/2013	6/25/2013	< 0.0159	0.03477	+/-0.00531
328785006	6/25/2013	7/2/2013	< 0.0102	0.0362	+/-0.00524
329309006	7/2/2013	7/9/2013	< 0.028	0.02985	+/-0.00502
329922006	7/9/2013	7/16/2013	< 0.0205	0.02417	+/-0.00428
330259006	7/16/2013	7/23/2013	< 0.0373	0.01534	+/-0.00366
330702006	7/23/2013	7/30/2013	< 0.0282	0.03678	+/-0.00541
331148006	7/30/2013	8/7/2013	< 0.0319	0.06724	+/-0.00678
331513006	8/7/2013	8/13/2013	< 0.0276	0.02228	+/-0.00456
332043006	8/13/2013	8/20/2013	< 0.0112	0.03703	+/-0.00551
332352006	8/20/2013	8/27/2013	< 0.024	0.03269	+/-0.00509

Table A1.3

Table A1.3
Sample Type: Air Particulate Filter and Radioiodine Cartridge
Analysis: Gross Beta and I-131
Units: pCi/m3
AIR SAMPLE AS-7 UH

LLD (pCi/m3)			0.07	0.01	
LAB ID	START DATE	END DATE	I-131	GROSS BETA	
332754006	8/27/2013	9/3/2013	< 0.0292	0.06167	+/-0.00688
333162006	9/3/2013	9/10/2013	< 0.0113	0.06254	+/-0.00703
333707006	9/10/2013	9/17/2013	< 0.0317	0.07415	+/-0.00754
334027006	9/17/2013	9/24/2013	< 0.0171	0.03538	+/-0.0054
334492006	9/24/2013	10/1/2013	< 0.0124	0.05276	+/-0.0065
335178006	10/1/2013	10/8/2013	< 0.0125	0.01902	+/-0.00396
335658006	10/8/2013	10/15/2013	< 0.0206	0.0352	+/-0.0053
336215006	10/15/2013	10/22/2013	< 0.0192	0.04648	+/-0.0059
336629006	10/22/2013	10/29/2013	< 0.0314	0.04111	+/-0.00528
336940006	10/29/2013	11/5/2013	< 0.025	0.04372	+/-0.00551
337429006	11/5/2013	11/12/2013	< 0.0115	0.03331	+/-0.0047
337901006	11/12/2013	11/19/2013	< 0.0197	0.02307	+/-0.00396
338351006	11/19/2013	11/26/2013	< 0.0262	0.03251	+/-0.00473
338574006	11/26/2013	12/3/2013	< 0.0377	0.03748	+/-0.005
339246006	12/3/2013	12/10/2013	< 0.0124	0.02414	+/-0.00405
339504006	12/10/2013	12/17/2013	< 0.0193	0.04832	+/-0.00572
339922006	12/17/2013	12/23/2013	< 0.0285	0.03805	+/-0.00548
340141006	12/23/2013	12/31/2013	< 0.0323	0.04377	+/-0.0051
Average:				0.0377	
Maximum:				0.0742	
Minumum:				0.0123	

Table A1.4
Sample Type: Air Particulate Filter
Analysis: Gamma Isotopic
Units: pCi/m3
AIR PARTICULATE FILTER SAMPLES
(GAMMA)

LLD (pCi/m3) LAB ID	LOCATION	DATE	0.05 CS-134	0.06 CS-137
323849002	AS-3 61VA	2/8/2013	< 0.000567	< 0.000565
323849003	AS-7 UH	2/8/2013	< 0.000379	< 0.000315
323849001	AS-1 PG	2/9/2013	< 0.00116	< 0.000866
329803002	AS-3 61VA	5/10/2013	< 0.00036	< 0.000466
329803001	AS-1 PG	5/10/2013	< 0.000418	< 0.000344
329803003	AS-7 UH	5/10/2013	< 0.000579	< 0.000464
335789002	AS-3 61VA	8/9/2013	< 0.0005	< 0.000579
335789003	AS-7 UH	8/9/2013	< 0.000514	< 0.000399
335789001	AS-1 PG	8/9/2013	< 0.00129	< 0.000883
340912002	AS-3 61VA	11/12/2013	< 0.00115	< 0.00123
340912003	AS-7 UH	11/12/2013	< 0.000534	< 0.000553
340912001	AS-1 PG	11/12/2013	< 0.000775	< 0.000527

Table A 2.1
Sample Type: **Thermoluminescent Dosimeters**
Analysis: Gamma Dose
Units: mrem/Qtr

Inner Ring - Within General Area of Site Boundary					
Station	**1st Qtr**	**2nd Qtr**	**3rd Qtr**	**4th Qtr**	**Annual Mean**
M-16	9.7	10.5	10.7	11.6	10.6
M-19	8.9	9.3	10.2	10.3	9.7
M-21	11.1	11.7	12.6	12.6	12.0
M-22	8.7	7.8	8.6	9.8	8.8
M-23	8.2	7.0	9.3	9.7	8.6
M-25	8.5	2.8	8.7	10.0	7.5
M-28	9.9	10.3	11.3	11.9	10.9
M-94	9.3	9.8	11.6	11.3	10.5
M-95	6.8	7.3	7.1	7.8	7.3
M-96	6.8	6.9	7.9	8.8	7.6
M-97	7.4	7.6	8.3	8.9	8.0
M-98	11.2	11.2	11.9	12.7	11.8
M-99 *	12.5	11.5	14.7	13.6	13.1
M-100	11.0	10.7	11.2	12.9	11.4

*Location with highest annual mean

Outer Ring – Approximately Three (3) to Five (5) Miles from the Site					
Station	**1st Qtr**	**2nd Qtr**	**3rd Qtr**	**4th Qtr**	**Annual Mean**
M-36	7.8	7.7	9.1	9.4	8.5
M-40	5.2	4.7	6.0	6.7	5.7
M-48	8.9	9.5	9.6	10.4	9.6
M-49	9.9	10.5	10.9	12.1	10.8
M-50	9.1	9.9	10.7	10.6	10.1
M-55	10.9	10.8	11.5	12.0	11.3
M-57 *	10.8	11.1	12.8	13.0	11.9

*Location with highest annual mean

Table A 2.2
Sample Type: **Thermoluminescent Dosimeters**
Analysis: Gamma Dose
Units: mrem/Qtr

Special Interest Areas – Population Centers & Schools					
Station	**1st Qtr**	**2nd Qtr**	**3rd Qtr**	**4th Qtr**	**Annual Mean**
M-01 *	11.0	10.7	11.5	12.3	11.4
M-07	9.9	9.8	11.0	11.8	10.6
M-09	9.0	9.4	10.9	10.4	9.9
M-10	7.8	8.6	9.1	9.8	8.8
M-33	8.2	7.8	8.2	7.8	8.0
M-38	9.3	8.9	9.9	10.3	9.6
M-39	8.0	8.5	8.6	9.2	8.6

*Location with highest annual mean

Table A 2.3
Sample Type: **Thermoluminescent Dosimeters**
Analysis: Gamma Dose
Units: mrem/Qtr

Special Interest Areas – Control					
Station	**1st Qtr**	**2nd Qtr**	**3rd Qtr**	**4th Qtr**	**Annual Mean**
M-14	10.5	10.0	11.7	11.2	10.8

Table A3.1

Sample Type: Surface Water

Analysis: Gamma Isotopic

Units: pCi/L

SURFACE WATER SAMPLES (GAMMA)

LLD (pCi/L)			15	15	30	15	30	15	30	15	15	18	60	15
LAB ID	LOCATION	DATE	MN-54	CO-58	FE-59	CO-60	ZN-65	NB-95	ZR-95	I-131	CS-134	CS-137	BA-140	LA-140
321995002	MRUP	3/12/2013	< 3.37	< 3.29	< 6.66	< 3.71	< 7.44	< 3.54	< 5.68	< 5.64	< 3.69	< 3.53	< 5.54	< 5.54
321995001	MRDOWN	3/12/2013	< 2.74	< 2.57	< 5.31	< 3.24	< 6.52	< 3.10	< 5.39	< 4.66	< 3.06	< 3.38	< 4.81	< 4.81
327674003	MRUP	6/12/2013	< 2.58	< 2.92	< 5.77	< 2.97	< 5.63	< 3.15	< 5.64	< 7.86	< 3.21	< 2.83	< 6.45	< 6.45
327674004	MRUP DUP	6/12/2013	< 2.67	< 2.76	< 5.72	< 3.06	< 5.78	< 2.89	< 4.59	< 7.04	< 2.76	< 2.77	< 5.59	< 5.59
327674001	MRDOWN	6/12/2013	< 3.16	< 3.13	< 6.88	< 3.23	< 6.77	< 3.55	< 5.98	< 8.49	< 3.66	< 3.18	< 6.45	< 6.45
327674002	MRDOWN DUP	6/12/2013	< 2.48	< 2.78	< 5.61	< 3.02	< 5.82	< 2.90	< 4.77	< 7.02	< 2.68	< 2.63	< 5.60	< 5.60
334489003	MRUP	10/1/2013	< 2.90	< 2.95	< 5.73	< 2.90	< 5.94	< 2.94	< 4.96	< 6.68	< 2.91	< 3.68	< 5.24	< 5.24
334489004	MRUP DUP	10/1/2013	< 2.68	< 2.49	< 5.60	< 2.74	< 5.60	< 2.93	< 4.68	< 6.37	< 2.78	< 2.80	< 5.61	< 5.61
334489001	MRDOWN	10/1/2013	< 2.81	< 2.42	< 5.73	< 2.54	< 5.60	< 2.64	< 5.03	< 6.14	< 2.85	< 2.67	< 5.79	< 5.79
334489002	MRDOWN DUP	10/1/2013	< 2.72	< 2.70	< 5.76	< 2.81	< 5.70	< 2.86	< 4.9	< 6.27	< 2.95	< 2.80	< 5.22	< 5.22
344056003	MRUP	12/19/2013	< 1.61	< 2.75	< 8.50	< 1.41	< 3.32	< 3.06	< 5.46	<1200	< 1.62	<1.89	< 115	< 115
344056004	MRUP DUP	12/19/2013	< 3.01	< 5.22	< 14.6	< 2.56	< 6.89	< 5.57	< 9.93	<2090	< 3.11	< 2.77	< 204	< 204
344056001	MRDOWN	12/19/2013	< 1.57	< 2.62	< 7.32	< 1.58	< 3.46	< 2.95	< 5.05	<1150	< 1.55	< 1.50	< 108	< 108
344056002	MRDOWN DUP	12/19/2013	< 2.84	< 4.68	< 15.3	< 2.82	< 6.63	< 5.6	< 9.45	<2130	< 3.07	< 2.58	< 191	< 191
339967001	MRDOWN *	12/24/2013	< 6.56	< 6.61	< 10.7	< 7.23	< 14.9	< 6.88	< 11.1	< 9.62	< 6.66	< 7.90	< 11.9	< 11.9
339967002	MRDOWN DUP *	12/24/2013	< 5.94	< 5.62	< 12.3	< 6.09	< 13.8	< 5.94	< 12.0	< 9.93	< 5.12	< 4.97	< 8.62	< 8.62

"DUP" – indicates duplicate sample

* Annual Sample collected during liquid discharge

Table A3.2
Sample Type: Surface Water
Analysis: Tritium
Units: pCi/L
SURFACE WATER SAMPLES (TRITIUM)

LLD (pCi/L) LAB ID	LOCATION	DATE	3000 H-3	
318451001	Outfall 007	1/7/2013	< 397	
320567001	Outfall 007	2/11/2013	5140	+/-1146
321995003	Outfall 007	3/6/2013	< 554	
321995002	MRUP	3/12/2013	< 543	
321995001	MRDOWN	3/12/2013	< 545	
323423001	Outfall 007	4/3/2013	2190	+/-383
325089001	Outfall 007	5/1/2013	< 509	
326825001	Outfall 007	5/31/2013	< 503	
327674003	MRUP	6/12/2013	< 437	
327674004	MRUP DUP	6/12/2013	< 443	
327674001	MRDOWN	6/12/2013	< 432	
327674002	MRDOWN DUP	6/12/2013	< 430	
328377001	Outfall 007	6/26/2013	507.8	+/-275
328377002	Outfall 007	6/26/2013	579.9	+/-280
330803002	Outfall 007	7/30/2013	< 479	
330803001	Outfall 007	7/30/2013	< 470	
333449001	Outfall 007	8/30/2013	< 333	
333449002	Outfall 007 DUP	8/30/2013	< 328	
334398001	Outfall 007	9/27/2013	< 376	
334398002	Outfall 007 DUP	9/27/2013	< 408	
334489003	MRUP	10/1/2013	< 388	
334489004	MRUP DUP	10/1/2013	< 432	
334489001	MRDOWN	10/1/2013	< 435	
334489002	MRDOWN DUP	10/1/2013	< 435	
336850001	Outfall 007	10/31/2013	1122	+/-286
336850002	Outfall 007 DUP	10/31/2013	1362	+/-292
338576001	Outfall 007	12/3/2013	< 370	
344056003	MRUP	12/19/2013	< 535	
344056004	MRUP DUP	12/19/2013	< 528	
356004001	MRDOWN	12/19/2013	< 478	
356004002	MRDOWN DUP	12/19/2013	< 506	
340024001	Outfall 007	12/20/2013	< 382	
339967001	MRDOWN *	12/24/2013	< 400	
339967002	MRDOWN DUP *	12/24/2013	< 402	

* Annual Sample collected during liquid discharge
"DUP" – indicates duplicate sample.

Table A4.1
Sample Type: Ground Water
Analysis: Gamma Isotopic
Units: pCi/L
GROUND WATER SAMPLES (GAMMA)

LLD (pCi/L)			15	15	30	15	30	15	30	15	18	60	15
LAB ID	LOCATION	DATE	MN-54	CO-58	FE-59	CO-60	ZN-65	NB-95	ZR-95	CS-134	CS-137	BA-140	LA-140
339729002	CONSTWELL 3	12/5/2013	< 4.02	< 3.98	< 11.6	< 3.41	< 9.26	< 5.55	< 8.88	< 4.85	< 4.18	< 10.2	< 10.2
339729003	CONSTWELL 4	12/5/2013	< 5.20	< 4.89	< 9.62	< 6.17	< 10.6	< 6.56	< 10.6	< 4.96	< 4.92	< 13.0	< 13.0
339729001	PGWELL	12/17/2013	< 4.08	< 2.64	< 7.32	< 4.03	< 8.94	< 4.61	< 6.75	< 3.97	< 4.61	< 6.25	< 6.25

Table A4.2
Sample Type: Ground Water
Analysis: Tritium
Units: pCi/L
GROUND WATER SAMPLES (TRITIUM)

LLD (pCi/L) LAB ID	LOCATION	DATE	2000 H-3
339729002	CONSTWELL 3	12/5/2013	< 443
339729005	CONSTWELL 3 GG DUP	12/5/2013	< 448
339729003	CONSTWELL 4	12/5/2013	< 435
339729006	CONSTWELL 4 GG DUP	12/5/2013	< 446
339729001	PGWELL	12/17/2013	< 453
339729004	PGWELL GG DUP	12/17/2013	< 454

"DUP" – indicates duplicate sample.

Table A4.3
Sample Type: Ground Water
Analysis: Iodine-131
Units: pCi/L
GROUND WATER SAMPLES (IODINE-131)

LLD (pCi/L) LAB ID	LOCATION	DATE	1 I-131
339729002	CONSTWELL 3	12/5/2013	< 0.663
339729003	CONSTWELL 4	12/5/2013	< 0.669
339729001	PGWELL	12/17/2013	< 0.227
339889001	CONSTWELL 3	12/20/2013	< 0.617

Table A5.1
Sample Type: Sediment
Analysis: Gamma Isotopic
Units: pCi/kg
SEDIMENT SAMPLES (GAMMA)

LLD (pCi/kg) LAB ID	LOCATION	DATE	150 CS-134	180 CS-137
338580002	SEDCONT	11/20/2013	< 46.2	< 36.5
338580004	SEDCONT DUP	11/20/2013	< 72.4	< 57.8
338580001	SEDHAM	11/20/2013	< 71.0	< 50.7
338580003	SEDHAM DUP	11/20/2013	< 45.8	< 41.5

"DUP" – indicates duplicate sample.

Table A6.1
Sample Type: Fish
Analysis: Gamma Isotopic
Units: pCi/kg
FISH SAMPLES (GAMMA)

LLD (pCi/kg)			130	130	260	130	260	130	150
LAB ID	LOCATION	DATE	MN-54	CO-58	FE-59	CO-60	ZN-65	CS-134	CS-137
336453001	FISHUP	10/23/2013	< 7.73	< 8.83	< 22.1	< 6.30	< 22.5	< 9.41	< 6.54
336453002	FISHDOWN	10/23/2013	< 7.12	< 7.30	< 23.3	< 10.0	< 19.9	< 8.86	< 7.85

Table A7.1
Sample Type: Vegetation
Analysis: Gamma Isotopic
Units: pCi/kg
VEGETATION SAMPLES (GAMMA)

LLD (pCi/kg) LAB ID	LOCATION	DATE	60 I-131	60 CS-134	80 CS-137
322437001	VEG-CONT	3/20/2013	< 11.8	< 8.94	< 8.35
322437002	VEG-J	3/20/2013	< 12.6	< 11.0	< 10.5
327789001	VEG-CONT	6/14/2013	< 16.8	< 11.9	< 10.6
327789002	VEG-J	6/14/2013	< 16.0	< 12.0	< 10.8
335134002	VEG-J	9/30/2013	< 19.4	< 10.5	< 8.87
335134001	VEG-CONT	10/2/2013	< 21.7	< 12.5	< 11.2
339964002	VEG-J	12/19/2013	< 55.1	< 22.9	< 22.7
339964001	VEG-CONT	12/19/2013	< 54.2	< 26.1	< 22.7

Table A 8.1
Sample Type: **Special Samples**
Analysis: Gamma Isotopic
Units: pCi/L

SPECIAL SURFACE WATER SAMPLES (GAMMA)

LLD LAB ID	LOCATION	DATE	15 MN-54	15 CO-58	30 FE-59	15 CO-60	30 ZN-65	15 NB-95	30 ZR-95	15 I-131	15 CS-134	18 CS-137	60 BA-140	15 LA-140
320567001	OUTFALL 007	2/11/2013	<3.25	<3.01	<6.07	<3.47	<6.41	<3.13	<5.77	<6.64	<3.42	<4.19	<5.65	<5.65
330803001	OUTFALL 007	7/30/2013	<7.89	<8.92	<12.4	<8.32	<12.6	<7.51	<14.3	<13.2	<8.21	<8.08	<11.6	<11.6

Table A 9.1
Sample Type: Quality Assurance Report
Analysis: Environmental Dosimeters

STANFORD DOSIMETRY

TABLE 1

PERCENTAGE OF INDIVIDUAL DOSIMETERS THAT PASSED EDC INTERNAL CRITERIA JANUARY – DECEMBER 2013[1], [2]

Dosimeter Type	Number Tested	% Passed Bias Criteria	% Passed Precision Criteria
Panasonic Environmental	72	100	100

[1]This table summarizes results of tests conducted by EDC.
[2]Environmental dosimeter results are free in air.

TABLE 2

MEAN DOSIMETER ANALYSES (N=6) JANUARY – DECEMBER 2013[1], [2]

Process Date	Mean Bias %	Standard Deviation %	Tolerance Limit +/-15%
4/22/2013	4.1	1.9	Pass
4/24/2013	4.5	1.2	Pass
5/23/2013	-1.1	1.9	Pass
7/24/2013	0.8	1.0	Pass
8/4/2013	-1.1	1.6	Pass
8/6/2013	0.1	2.3	Pass
10/31/2013	1.5	1.2	Pass
11/10/2013	0.1	1.7	Pass
11/15/2013	-1.8	1.0	Pass
1/27/2014	3.7	2.3	Pass
1/31/2014	2.6	0.9	Pass
2/5/2014	0.7	0.6	Pass

[1]This table summarizes results of tests conducted by EDC for TLDs issued in 2013.
[2]Environmental dosimeter results are free in air.

TABLE 3

SUMMARY OF INDEPENDENT DOSIMETER TESTING JANUARY – DECEMBER 2013[1], [2]

Issuance Period	Client	Mean Bias %	Standard Deviation %	Pass / Fail
2nd Qtr.2013	Millstone	0.7	1.5	Pass
2nd Qtr.2013	Seabrook	-2.3	2.7	Pass
3rd Qtr. 2013	Millstone	-4.7	4.0	Pass
4th Qtr.2013	Seabrook	-0.9	0.9	Pass

[1]Performance criteria are +/- 30%.
[2]Blind spike irradiations using Cs-137

Table A.9.2
Sample Type: Quality Assurance Report
Matrix: Milk, Soil, Liquid, Vegetation, Air Charcoal, Air Particulate, Water

GEL LABORATORIES LLC

TABLES

FIGURES

2013 ANNUAL QUALITY ASSURANCE REPORT FOR THE RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM (REMP)

1. Introduction

GEL Laboratories, LLC (GEL) is a privately owned environmental laboratory dedicated to providing personalized client services of the highest quality. GEL was established as an analytical testing laboratory in 1981. Now a full service lab, our analytical divisions use state of the art equipment and methods to provide a comprehensive array of organic, inorganic, and radiochemical analyses to meet the needs of our clients.

At GEL, quality is emphasized at every level of personnel throughout the company. Management's ongoing commitment to good professional practice and to the quality of our testing services to our customers is demonstrated by their dedication of personnel and resources to develop, implement, assess, and improve our technical and management operations.

The purpose of GEL's quality assurance program is to establish policies, procedures, and processes to meet or exceed the expectations of our clients. To achieve this, all personnel that support these services to our clients are introduced to the program and policies during their initial orientation, and annually thereafter during company-wide training sessions.

GEL's primary goals are to ensure that all measurement data generated are scientifically and legally defensible, of known and acceptable quality per the data quality objectives (DQOs), and thoroughly documented to provide sound support for environmental decisions. In addition, GEL continues to ensure compliance with all contractual requirements, environmental standards, and regulations established by local, state and federal authorities.

GEL administers the QA program in accordance with the Quality Assurance Plan, GL-QS-B-001. Our Quality Systems include all quality assurance (QA) policies and quality control (QC) procedures necessary to plan, implement, and assess the work we perform. GEL's QA Program establishes a quality management system (QMS) that governs all of the activities of our organization.

This report entails the quality assurance program for the proficiency testing and environmental monitoring aspects of GEL for 2013. GEL's QA Program is designed to monitor the quality of analytical processing associated with environmental, radiobioassay, effluent (10 CFR Part 50), and waste (10 CFR Part 61) sample analysis.

This report covers the category of Radiological Environmental Monitoring Program (REMP) and includes:

- Intra-laboratory QC results analyzed during 2013.
- Inter-laboratory QC results analyzed during 2013 where known values were available.

2. Quality Assurance Programs for Inter-laboratory, Intra-laboratory and Third Party Cross-Check

In addition to internal and client audits, our laboratory participates in annual performance evaluation studies conducted by independent providers. We routinely participate in the following types of performance audits:

- Proficiency testing and other inter-laboratory comparisons
- Performance requirements necessary to retain Certifications
- Evaluation of recoveries of certified reference and in-house secondary reference materials using statistical process control data.
- Evaluation of relative percent difference between measurements through SPC data.

We also participate in a number of proficiency testing programs for federal and state agencies and as required by contracts. It is our policy that no proficiency evaluation samples be analyzed in any special manner. Our annual performance evaluation participation generally includes a combination of studies that support the following:

- US Environmental Protection Agency Discharge Monitoring Report, Quality Assurance Program (DMR-QA). Annual national program sponsored by EPA for laboratories engaged in the analysis of samples associated with the NPDES monitoring program. Participation is mandatory for all holders of NPDES permits. The permit holder must analyze for all of the parameters listed on the discharge permit. Parameters include general chemistry, metals, BOD/COD, oil and grease, ammonia, nitrates, etc.

- Department of Energy Mixed Analyte Performance Evaluation Program (MAPEP). A semiannual program developed by DOE in support of DOE contractors performing waste analyses. Participation is required for all laboratories that perform environmental analytical measurements in support of environmental management activities. This program includes radioactive isotopes in water, soil, vegetation and air filters.

- ERA's MRAD-Multimedia Radiochemistry Proficiency test program. This program is for labs seeking certification for radionuclides in wastewater and solid waste. The program is conducted in strict compliance with USEPA National Standards for Water Proficiency study.

- ERA's InterLaB RadCheM Proficiency Testing Program for radiological analyses. This program completes the process of replacing the USEPA EMSL-LV Nuclear Radiation Assessment Division program discontinued in 1998. Laboratories seeking certification for radionuclide analysis in drinking water also use the study. This program is conducted in strict compliance with the USEPA National Standards for Water Proficiency Testing Studies. This program encompasses Uranium by EPA method 200.8 (for drinking water certification in Utah/Primary NELAP), gamma emitters, Gross Alpha/Beta, Iodine-131, naturally occurring radioactive isotopes, Strontium-89/90, and Tritium.

- ERA's Water Pollution (WP) biannual program for waste methodologies includes parameters for both organic and inorganic analytes.

- ERA's Water Supply (WS) biannual program for drinking water methodologies includes parameters for organic and inorganic analytes.

- Environmental Cross-Check Program administered by Eckert & Ziegler Analytics, Inc. This program encompasses radionuclides in water, soil, milk, naturally occurring radioactive isotopes in soil and air filters.

GEL procures single-blind performance evaluation samples from Eckert & Ziegler Analytics to verify the analysis of sample matrices processed at GEL. Samples are received on a quarterly basis. GEL's Third-Party Cross-Check Program provides environmental matrices encountered in a typical nuclear utility REMP. The Third-Party Cross-Check Program is intended to meet or exceed the inter-laboratory comparison program requirements discussed in NRC Regulatory Guide 4.15. Once performance evaluation samples have been prepared in accordance with the instructions provided by the PT provider, samples are managed and analyzed in the same manner as environmental samples from GEL's clients.

3. Quality Assurance Program for Internal and External Audits

During each annual reporting period, at least one internal assessment of each area of the laboratory is conducted in accordance with the pre-established schedule from Standard Operating Procedure for the Conduct of Quality Audits, GL-QS-E-001. The annual internal audit plan is reviewed for adequacy and includes the scheduled frequency and scope of quality control actions necessary to GEL's QA program. Internal audits are conducted at least annually in accordance with a schedule approved by the Quality Systems Director. Supplier audits are contingent upon the categorization of the supplier, and may or may not be conducted prior to the use of a supplier or subcontractor. Type I suppliers and subcontractors, regardless of how they were initially qualified, are re-evaluated at least once every three years.

In addition, prospective customers audit GEL during pre-contract audits. GEL hosts several external audits each year for both our clients and other programs. These programs include environmental monitoring, waste characterization, and radiobioassay. The following list of programs may audit GEL at least annually or up to every three years depending on the program.

- NELAC, National Environmental Laboratory Accreditation Program
- DOECAP, U.S. Department of Energy Consolidated Audit Program
- DOELAP, U.S. Department of Energy Laboratory Accreditation Program
- DOE QSAS, U.S. Department of Energy, Quality Systems for Analytical Services
- ISO/IEC 17025:2005
- A2LA, American Association for Laboratory Accreditation
- DOD ELAP, US Department of Defense Environmental Accreditation Program
- NUPIC, Nuclear Procurement Issues Committee
- South Carolina Department of Heath and Environmental Control (SC DHEC)

The annual radiochemistry laboratory internal audit (13-RAD-001) was conducted in August 2013. Three (3) findings, two (2) observations, and one (1) recommendations resulted from this assessment. By October, 2013, each finding was closed and appropriate laboratory staff addressed each observation and recommendation.

4. Performance Evaluation Acceptance Criteria for Environmental Sample Analysis

GEL utilized an acceptance protocol based upon two performance models. For those inter-laboratory programs that already have established performance criteria for bias (i.e., MAPEP, and ERA/ELAP), GEL will utilize the criteria for the specific program. For intra-laboratory or third party quality control programs that do not have a specific acceptance criteria (i.e. the Eckert-Ziegler Analytics Environmental Cross-check Program), results will be evaluated in accordance with GEL's internal acceptance criteria.

5. Performance Evaluation Samples

Performance Evaluation (PE) results and internal quality control sample results are evaluated in accordance with GEL acceptance criteria. The first criterion concerns bias, which is defined as the deviation of any one result from the known value. The second criterion concerns precision, which deals with the

ability of the measurement to be replicated by comparison of an individual result with the mean of all results for a given sample set.

At GEL, we also evaluate our analytical performance on a regular basis through statistical process control (SPC) acceptance criteria. Where feasible, this criterion is applied to both measures of precision and accuracy and is specific to sample matrix. We establish environmental process control limits at least annually.

For Radiochemistry analysis, quality control evaluation is based on static limits rather than those that are statistically derived. Our current process control limits are maintained in GEL's AlphaLIMS. We also measure precision with matrix duplicates and/or matrix spike duplicates. The upper and lower control limits (UCL and LCL respectively) for precision are plus or minus three times the standard deviation from the mean of a series of relative percent differences. The static precision criteria for radiochemical analyses are 0 - 20%, for activity levels exceeding the contract required detection limit (CRDL).

6. Quality Control Program for Environmental Sample Analysis

GEL's internal QA Program is designed to include QC functions such as instrumentation calibration checks (to insure proper instrument response), blank samples, instrumentation backgrounds, duplicates, as well as overall staff qualification analyses and statistical process controls. Both quality control and qualification analyses samples are used to be as similar as the matrix type of those samples submitted for analysis by the various laboratory clients. These performance test samples (or performance evaluation samples) are either actual sample submitted in duplicate in order to evaluate the precision of laboratory measurements, or fortified blank samples, which have been given a known quantity of a radioisotope that is in the interest to GEL's clients.

Accuracy (or Bias) is measured through laboratory control samples and/or matrix spikes, as well as surrogates and internal standards. The UCLs and LCLs for accuracy are plus or minus three times the standard deviation from the mean of a series of recoveries. The static limit for radiochemical analyses is 75 - 125%. Specific instructions for out-of-control situations are provided in the applicable analytical SOP.

GEL's Laboratory Control Standard (LCS) is an aliquot of reagent water or other blank matrix to which known quantities of the method analytes are added in the laboratory. The LCS is analyzed exactly like a sample, and its purpose is to determine whether the methodology is in control, and whether the laboratory is capable of making accurate and precise measurements. Some methods may refer to these samples as Laboratory Fortified Blanks (LFB). The requirement for recovery is between 75 and 125% for radiological analyses excluding drinking water matrix.

$$\text{Bias (\%)} = \frac{\text{(observed concentration)}}{\text{(known concentration)}} * 100\ \%$$

Precision is a data quality indicator of the agreement between measurements of the same property, obtained under similar conditions, and how well they conform to themselves. Precision is usually expressed as standard deviation, variance or range in either absolute or relative (percentage) terms.

GEL's laboratory duplicate (DUP or LCSD) is an aliquot of a sample taken from the same container and processed in the same manner under identical laboratory conditions. The aliquot is analyzed independently from the parent sample and the results are compared to measure precision and accuracy.

If a sample duplicate is analyzed, it will be reported as Relative Percent Difference (RPD). The RPD must be 20 percent or less, if both samples are greater than 5 times the MDC. If both results are less than 5 times MDC, then the RPD must be equal to or less than 100%. If one result is above the MDC and the other is below the MDC, then the RPD can be calculated using the MDC for the result of the one below the MDC. The RPD must be 100% or less. In the situation where both results are above the MDC but one

result is greater than 5 times the MDC and the other is less than 5 times the MDC, the RPD must be less than or equal to 20%. If both results are below MDC, then the limits on % RPD are not applicable.

$$\text{Difference (\%)} = \frac{\text{(high duplicate result – low duplicate result)}}{\text{(average of results)}} * 100\ \%$$

7. Summary of Data Results

During 2013, forty-four (44) radioisotopes associated with seven (7) matrix types were analyzed under GEL's Performance Evaluation program in participation with ERA, MAPEP, and Eckert & Ziegler Analytics. Matrix types were representative of client analyses performed during 2012. Of the four hundred twenty-three (423) total results reported, 97% (410 of 423) were found to be acceptable. The list below contains the type of matrix evaluated by GEL.

- Air Filter
- Cartridge
- Water
- Milk
- Soil
- Liquid
- Vegetation

Graphs are provided in Figures 1-9 of this report to allow for the evaluation of trends or biases. These graphs include radioisotopes Cobalt-60, Cesium-137, Tritium, Strontium-90, Gross Alpha, Gross Beta, Iodine-131, Americium-241, and Plutonium-238.

8. Summary of Participation in the Eckert & Ziegler Analytics Environmental Cross-Check Program

Eckert & Ziegler Analytics provided samples for eighty-nine (89) individual environmental analyses. The accuracy of each result reported to Eckert & Ziegler Analytics, Inc. is measured by the ratio of GEL's result to the known value. All results fell within GEL's acceptance criteria (100%).

9. Summary of Participation in the MAPEP Monitoring Program

MAPEP Series 27, 28 and 29 were analyzed by the laboratory. Of the one hundred thirty-eight (138) analyses, 96% (133 out of 138) of all results fell within the PT provider's acceptance criteria. Five analytical failures occurred: Uranium-238/235 and Total Uranium in vegetation by ICP/MS, and Uranium-234/233, and Uranium-238 by Alpha Spectroscopy.

For the corrective actions associated with MAPEP Series 28, refer to CARR130513-789 which is detailed in Table 8.

10. Summary of Participation in the ERA MRaD PT Program

The ERA MRad program provided samples (MRAD-18 and MRAD-19) for one hundred fifty (150) individual environmental analyses. One hundred forty-five (145) of the 150 analyses fell within the PT provider's acceptance criteria (97%). Five analytical failures occurred: Cesium-134, Cesium-137 and Zinc-65 in soil, and Uranium-234 and Total Uranium in vegetation.

For the corrective actions associated with MRAD-18 and MRAD-19, refer to CARR130522-791 and CARR131205-845 which are detailed in Table 8.

11. Summary of Participation in the ERA PT Program

The ERA program provided samples (RAD-92 and RAD-94) for forty-six (46) individual environmental analyses. Of the 44 analyses, 93% (43 out of 44) of all results fell within the PT provider's acceptance criteria. Two analytical failures occurred: Gross Alpha and Strontium-89 in water.

For the corrective actions associated with RAD-92 refer to corrective actions CARR130826-810 (Table 8).

12. Corrective Action Request and Report (CARR)

There are two categories of corrective action at GEL. One is corrective action implemented at the analytical and data review level in accordance with the analytical SOP. The other is formal corrective action documented by the Quality Systems Team in accordance with GL-QS-E-002. A formal corrective action is initiated when a nonconformance reoccurs or is so significant that permanent elimination or prevention of the problem is required. Formal corrective action investigations include root cause analysis.

GEL includes quality requirements in most analytical standard operating procedures to ensure that data are reported only if the quality control criteria are met or the quality control measures that did not meet the acceptance criteria are documented. A formal corrective action is implemented according to GL-QS-E-002 for Conducting Corrective/Preventive Action and Identifying Opportunities for Improvement. Recording and documentation is performed following guidelines stated in GL-QS-E-012 for Client NCR Database Operation.

Any employee at GEL can identify and report a nonconformance and request that corrective action be taken. Any GEL employee can participate on a corrective action team as requested by the QS team or Group Leaders. The steps for conducting corrective action are detailed in GL-QS-E-002. In the event that correctness or validity of the laboratory's test results in doubt, the laboratory will take corrective action. If investigations show that the results have been impacted, affected clients will be informed of the issue in writing within five (5) calendar days of the discovery.

Table 8 provides the status of CARRs for radiological performance testing during 2013. **It has been determined that causes of the failures did not impact any data reported to our clients.**

13. References

1. GEL Quality Assurance Plan, GL-QS-B-001
2. GEL Standard Operating Procedure for the Conduct of Quality Audits, GL-QS-E-001
3. GEL Standard Operating Procedure for Conducting Corrective/Preventive Action and Identifying Opportunities for Improvement, GL-QS-E-002
4. GEL Standard Operating Procedure for AlphaLIMS Documentation of Nonconformance Reporting and Dispositioning and Control of Nonconforming Items, GL-QS-E-004
5. GEL Standard Operating Procedure for Handling Proficiency Evaluation Samples, GL-QS-E-013
6. GEL Standard Operating Procedure for Quality Assurance Measurement Calculations and Processes, GL-QS-E-014
7. 40 CFR Part 136 Guidelines Establishing Test Procedures for the Analysis of Pollutants
8. ISO/IEC 17025-2005, General Requirements for the Competence of Testing and Calibration Laboratories
9. ANSI/ASQC E4-1994, Specifications and Guidelines for Quality Systems for Environmental Data Collection and Environmental Technology Programs, American National Standard
10. 2003 NELAC Standard, National Environmental Laboratory Accreditation Program
11. 2009 TNI Standard, The NELAC Institute, National Environmental Accreditation Program
12. MARLAP, Multi-Agency Radiological Laboratory Analytical Protocols
13. 10 CFR Part 21, Reporting of Defects and Noncompliance
14. 10 CFR Part 50 Appendix B, Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants
15. 10 CFR Part 61, Licensing Requirements for Land Disposal and Radioactive Waste
16. NRC REG Guide 4.15 and NRC REG Guide 4.8

TABLE 1

2013 RADIOLOGICAL PROFICIENCY TESTING RESULTS AND ACCEPTANCE CRITERIA

PT Provider	Quarter / Year	Analytical Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MAPEP	1st/ 2013	02/27/13	GENE01-13-RdFR1	Filter	Bq/sample	Uranium-234/233	0.0143	0.0155	0.0109-0.0202	Acceptable
MAPEP	1st/ 2013	02/27/13	GENE01-13-RdFR1	Filter	Bq/sample	Uranium-238	0.0999	0.098	0.069-0.127	Acceptable
EZA	4th/2012	02/01/13	E10323	Cartridge	pCi	Iodine-131	7.31E+01	7.29E+01	1.00	Acceptable
EZA	4th/2012	02/01/13	E10324	Milk	pCi/L	Strontium-89	9.89E+00	1.38E+01	0.72	Acceptable
EZA	4th/2012	02/01/13	E10324	Milk	pCi/L	Strontium-90	9.83E+00	1.48E+01	1.02	Acceptable
EZA	4th/2012	02/01/13	E10325	Milk	pCi/L	Iodine-131	9.57E+01	9.00E+01	1.06	Acceptable
EZA	4th/2012	02/01/13	E10325	Milk	pCi/L	Chromium-51	3.67E+02	3.48E+02	1.06	Acceptable
EZA	4th/2012	02/01/13	E10325	Milk	pCi/L	Cesium-134	1.54E+02	1.65E+02	0.93	Acceptable
EZA	4th/2012	02/01/13	E10325	Milk	pCi/L	Cesium-137	1.18E+02	1.17E+02	1.01	Acceptable
EZA	4th/2012	02/01/13	E10325	Milk	pCi/L	Cobalt-58	9.85E+01	9.85E+01	1	Acceptable
EZA	4th/2012	02/01/13	E10325	Milk	pCi/L	Manganese-54	1.16E+02	1.16E+02	1	Acceptable
EZA	4th/2012	02/01/13	E10325	Milk	pCi/L	Iron-59	1.33E+02	1.16E+02	1.15	Acceptable
EZA	4th/2012	02/01/13	E10325	Milk	pCi/L	Zinc-65	3.19E+02	2.91E+02	1.09	Acceptable
EZA	4th/2012	02/01/13	E10325	Milk	pCi/L	Cobalt-60	1.73E+02	1.70E+02	1.02	Acceptable
EZA	4th/2012	02/01/13	E10325	Milk	pCi/L	Cesium-141	5.38E+01	5.10E+01	1.05	Acceptable
EZA	4th/2012	02/01/13	E10380	Water	pCi/L	Iodine-131	7.47E+01	7.25E+01	1.03	Acceptable
EZA	4th/2012	02/01/13	E10380	Water	pCi/L	Chromium-51	3.81E+02	3.62E+02	1.05	Acceptable
EZA	4th/2012	02/01/13	E10380	Water	pCi/L	Cesium-134	1.57E+02	1.73E+02	0.91	Acceptable
EZA	4th/2012	02/01/13	E10380	Water	pCi/L	Cesium-137	1.25E+02	1.22E+02	1.03	Acceptable
EZA	4th/2012	02/01/13	E10380	Water	pCi/L	Cobalt-58	1.02E+02	1.03E+02	0.99	Acceptable
EZA	4th/2012	02/01/13	E10380	Water	pCi/L	Manganese-54	1.28E+02	1.21E+02	1.06	Acceptable
EZA	4th/2012	02/01/13	E10380	Water	pCi/L	Iron-59	1.38E+02	1.21E+02	1.14	Acceptable
EZA	4th/2012	02/01/13	E10380	Water	pCi/L	Zinc-65	2.13E+02	1.94E+02	1.1	Acceptable
EZA	4th/2012	02/01/13	E10380	Water	pCi/L	Cobalt-60	1.80E+02	1.77E+02	1.01	Acceptable
ERA	1st/ 2013	02/28/13	RAD - 92	Water	pCi/L	Barium-133	55.4	54.4	44.9-60.2	Acceptable
ERA	1st/ 2013	02/28/13	RAD - 92	Water	pCi/L	Cesium-134	27.2	29.9	23.4-32.9	Acceptable
ERA	1st/ 2013	02/28/13	RAD - 92	Water	pCi/L	Cesium-137	74.3	75.3	67.8-85.5	Acceptable
ERA	1st/ 2013	02/28/13	RAD - 92	Water	pCi/L	Cobalt-60	89.0	97.7	87.9-110	Acceptable
ERA	1st/ 2013	02/28/13	RAD - 92	Water	pCi/L	Zinc-65	126	114	103-136	Acceptable

PT Provider	Quarter / Year	Analytical Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
ERA	1st/ 2013	02/28/13	RAD - 92	Water	pCi/L	Gross Alpha	26.0	24.8	12.5-33.0	Acceptable
ERA	1st/ 2013	02/28/13	RAD - 92	Water	pCi/L	Gross Beta	19.4	19.3	11.3-27.5	Acceptable
ERA	1st/ 2013	02/28/13	RAD - 92	Water	pCi/L	Gross Alpha	31.4	24.8	12.5-33.0	Acceptable
ERA	1st/ 2013	02/28/13	RAD - 92	Water	pCi/L	Radium-226	10.4	9.91	7.42-11.6	Acceptable
ERA	1st/ 2013	02/28/13	RAD - 92	Water	pCi/L	Radium-228	4.84	5.22	3.14-6.96	Acceptable
ERA	1st/ 2013	02/28/13	RAD - 92	Water	pCi/L	Uranium (Nat)	6.43	5.96	4.47-7.13	Acceptable
ERA	1st/ 2013	02/28/13	RAD - 92	Water	ug/L	Uranium (Nat) mass	9.59	8.69	6.50-10.4	Acceptable
ERA	1st/ 2013	02/28/13	RAD - 92	Water	pCi/L	Radium-226	11.60	9.91	7.42-11.6	Acceptable
ERA	1st/ 2013	02/28/13	RAD - 92	Water	pCi/L	Radium-228	5.13	5.22	3.14-6.96	Acceptable
ERA	1st/ 2013	02/28/13	RAD - 92	Water	pCi/L	Uranium (Nat)	5.95	5.96	4.47-7.13	Acceptable
ERA	1st/ 2013	02/28/13	RAD - 92	Water	ug/L	Uranium (Nat) mass	9.95	8.69	6.50-10.4	Acceptable
ERA	1st/ 2013	02/28/13	RAD - 92	Water	pCi/L	Tritium	1430	1320	1040-1480	Acceptable
ERA	1st/ 2013	02/28/13	RAD - 92	Water	pCi/L	Strontium-89	47.5	48	37.6-55.3	Acceptable
ERA	1st/ 2013	02/28/13	RAD - 92	Water	pCi/L	Strontium-90	35.9	39.8	29.2-45.8	Acceptable
ERA	1st/ 2013	02/28/13	RAD - 92	Water	pCi/L	Strontium-89	42.9	48	37.6-55.3	Acceptable
ERA	1st/ 2013	02/28/13	RAD - 92	Water	pCi/L	Strontium-90	34.6	39.8	29.2-45.8	Acceptable
ERA	1st/ 2013	02/28/13	RAD - 92	Water	pCi/L	Iodine-131	23.6	22.7	18.8-27.0	Acceptable
ERA	1st/ 2013	02/28/13	RAD - 92	Water	pCi/L	Iodine-131	27	22.7	18.8-27.0	Acceptable
EZA	1st/ 2013	04/25/13	E10469	Cartridge	pCi	Iodine-131	9.38E+01	9.27E+01	1.01	Acceptable
EZA	1st/ 2013	04/25/13	E10470	Milk	pCi/L	Strontium-89	1.07E+02	9.97E+01	1.07	Acceptable
EZA	1st/ 2013	04/25/13	E10470	Milk	pCi/L	Strontium-90	1.18E+01	1.10E+01	1.07	Acceptable
EZA	1st/ 2013	04/25/13	E10471	Milk	pCi/L	Iodine-131	3.54E+00	1.67E+00	1.12	Acceptable
EZA	1st/ 2013	04/25/13	E10471	Milk	pCi/L	Cerium-141	2.00E+01	1.87E+01	1.07	Acceptable
EZA	1st/ 2013	04/25/13	E10471	Milk	pCi/L	Chromium-51	5.09E+01	4.72E+01	1.08	Acceptable
EZA	1st/ 2013	04/25/13	E10471	Milk	pCi/L	Cesium-134	2.06E+02	2.14E+02	0.96	Acceptable
EZA	1st/ 2013	04/25/13	E10471	Milk	pCi/L	Cesium-137	2.83E+02	2.66E+02	1.07	Acceptable
EZA	1st/ 2013	04/25/13	E10471	Milk	pCi/L	Cobalt-58	2.19E+02	2.08E+02	1.05	Acceptable
EZA	1st/ 2013	04/25/13	E10471	Milk	pCi/L	Mn-54	2.21E+02	2.08E+02	1.06	Acceptable
EZA	1st/ 2013	04/25/13	E10471	Milk	pCi/L	Iron-59	2.78E+02	2.52E+02	1.1	Acceptable
EZA	1st/ 2013	04/25/13	E10471	Milk	pCi/L	Zinc-65	3.39E+02	3.01E+02	1.13	Acceptable
EZA	1st/ 2013	04/25/13	E10471	Milk	pCi/L	Cobalt-60	4.02E+02	4.00E+02	1.01	Acceptable
EZA	1st/ 2013	04/25/13	E10472	Water	pCi/L	Iodine-131	1.12E+02	9.28E+01	1.21	Acceptable
EZA	1st/ 2013	04/25/13	E10472	Water	pCi/L	Cerium-141	1.88E+02	1.79E+02	1.05	Acceptable
EZA	1st/ 2013	04/25/13	E10472	Water	pCi/L	Chromium-51	4.84E+02	4.52E+02	1.07	Acceptable

PT Provider	Quarter / Year	Analytical Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
EZA	1st/ 2013	04/25/13	E10472	Water	pCi/L	Cesium-134	1.96E+02	2.05E+02	0.96	Acceptable
EZA	1st/ 2013	04/25/13	E10472	Water	pCi/L	Cesium-137	2.71E+02	2.54E+02	1.07	Acceptable
EZA	1st/ 2013	04/25/13	E10472	Water	pCi/L	Cobalt-58	2.03E+02	1.99E+02	1.02	Acceptable
EZA	1st/ 2013	04/25/13	E10472	Water	pCi/L	Mn-54	2.15E+02	1.99E+02	1.08	Acceptable
EZA	1st/ 2013	04/25/13	E10472	Water	pCi/L	Iron-59	2.67E+02	2.41E+02	1.11	Acceptable
EZA	1st/ 2013	04/25/13	E10472	Water	pCi/L	Zinc-65	3.14E+02	2.88E+02	1.09	Acceptable
EZA	1st/ 2013	04/25/13	E10472	Water	pCi/L	Cobalt-60	3.92E+02	3.83E+02	1.02	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-27-GrF28	Filter	Bq/sample	Gross Alpha	0.656	1.20	0.36-2.04	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-27-GrF29	Filter	Bq/sample	Gross Beta	0.954	0.85	0.43-1.28	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-MaS28	Soil	mg/kg	Americium-241	118	113	79-147	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-MaS28	Soil	mg/kg	Cesium-134	829	887	621-1153	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-MaS28	Soil	mg/kg	Cesium-137	623	587	411-763	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-MaS28	Soil	mg/kg	Cobalt-57	1.04	0	False Pos Test	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-MaS28	Soil	mg/kg	Cobalt-60	737	691	484-898	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-MaS28	Soil	mg/kg	Iron-55	-0.380	0	False Pos Test	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-MaS28	Soil	mg/kg	Manganese-54	0.760	0	False Pos Test	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-MaS28	Soil	mg/kg	Nickel-63	719	670	469-871	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-MaS28	Soil	mg/kg	Plutonium-238	0.571	0.52	Sens. Eval.	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-MaS28	Soil	mg/kg	Plutonium-239/240	77.70	79.5	55.7-103.4	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-MaS28	Soil	mg/kg	Potassium-40	713	625	438-813	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-MaS28	Soil	mg/kg	Strontium-90	693.0	628	440-816	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-MaS28	Soil	mg/kg	Technetium-99	419.0	444	311-577	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-MaS28	Soil	mg/kg	Uranium-234/233	60.0	62.5	43.8-81.3	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-MaS28	Soil	mg/kg	Uranium-238	274	281	197-365	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-MaS28	Soil	mg/kg	Zinc-65	1130	995	697-1294	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-MaW28	Water	Bq/L	Americium-241	0.690	0.689	0.428-0.896	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-MaW28	Water	Bq/L	Cesium-134	21.1	24.4	17.1-31.7	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-MaW28	Water	Bq/L	Cesium-137	0.10	0.0	False Pos Test	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-MaW28	Water	Bq/L	Cobalt-57	31.0	30.9	21.6-40.2	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-MaW28	Water	Bq/L	Cobalt-60	19.4	19.6	13.7-25.4	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-MaW28	Water	Bq/L	Hydrogen-3	517	507	355-659	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-MaW28	Water	Bq/L	Iron-55	39.7	44.0	30.8-57.2	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-MaW28	Water	Bq/L	Manganese-54	28.0	27.4	19.2-35.6	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-MaW28	Water	Bq/L	Nickel-63	32.9	33.4	23.4-43.4	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-MaW28	Water	Bq/L	Plutonium-238	0.825	0.884	0.619-1.149	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-MaW28	Water	Bq/L	Pu-239/240	0.0162	0.0096	Sens. Eval.	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-MaW28	Water	Bq/L	Potassium-40	-0.471	0	False Pos Test	Acceptable

PT Provider	Quarter / Year	Analytical Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MAPEP	2nd/2013	05/13/13	MAPEP-13-MaW28	Water	Bq/L	Strontium-90	12.5	10.5	7.4-13.7	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-MaW28	Water	Bq/L	Technetium-99	12.9	13.1	9.2-17.0	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-MaW28	Water	Bq/L	Uranium-234/233	0.289	0.315	0.221-0.410	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-MaW28	Water	Bq/L	Uranium-238	1.81	1.95	1.37-2.54	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-MaW28	Water	Bq/L	Zinc-65	32.8	30.4	21.3-39.5	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-GrW28	Water	Bq/L	Gross Alpha	2.60	2.31	0.69-3.93	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-GrW28	Water	Bq/L	Gross Beta	14.2	13.0	6.5-19.5	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-XaW28	Water	Bq/L	Iodine-129	5.94	6.06	4.24-7.88	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-RdF28	Filter	ug/sample	Uranium-235	0.036	0.036	0.025-0.047	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-RdF28	Filter	ug/sample	Uranium-238	18.0	18.6	13.0-24.2	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-RdF28	Filter	ug/sample	Uranium-Total	17.7	18.6	13.0-24.2	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-RdF28	Filter	ug/sample	Americium-241	0.106	0.104	0.073-0.135	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-RdF28	Filter	Bq/sample	Cesium-134	1.75	1.78	1.25-2.31	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-RdF28	Filter	Bq/sample	Cesium-137	2.71	2.60	1.82-3.38	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-RdF28	Filter	Bq/sample	Cobalt-57	2.51	2.36	1.65-3.07	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-RdF28	Filter	Bq/sample	Cobalt-60	0.005	0.00	False Pos Test	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-RdF28	Filter	Bq/sample	Manganese-54	4.43	4.26	2.98-5.54	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-RdF28	Filter	Bq/sample	Plutonium-238	0.124	0.127	0.089-0.165	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-RdF28	Filter	Bq/sample	Pu-239/240	0.118	0.1210	0.085-0.157	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-RdF28	Filter	Bq/sample	Strontium-90	1.54	1.49	1.04-1.94	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-RdF28	Filter	Bq/sample	Uranium-234/233	0.0342	0.0318	0.0223-0.0413	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-RdF28	Filter	Bq/sample	Uranium-238	0.230	0.231	0.162-0.300	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-RdF28	Filter	Bq/sample	Zinc-65	3.38	3.13	2.19-4.07	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-GrF28	Filter	Bq/sample	Gross Alpha	0.656	1.20	0.36-2.04	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-GrF28	Filter	Bq/sample	Gross Beta	0.95	0.85	0.43-1.28	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-RdF28	Filter	Bq/sample	Americium-241	0.106	0.104	0.073-0.135	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-RdV28	Vegetation	ug/sample	Uranium-235	0.0029	0.001	0.0009-0.0017	Not Accept.
MAPEP	2nd/2013	05/13/13	MAPEP-13-RdV28	Vegetation	ug/sample	Uranium-238	0.419	0.180	0.13-0.23	Not Accept.
MAPEP	2nd/2013	05/13/13	MAPEP-13-RdV28	Vegetation	ug/sample	Uranium-Total	0.4219	0.180	0.13-0.23	Not Accept.
MAPEP	2nd/2013	05/13/13	MAPEP-13-RdV28	Vegetation	ug/sample	Americium-241	0.1350	0.140	0.098-0.182	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-RdV28	Vegetation	Bq/sample	Cesium-134	0.0525	0.00	False Pos Test	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-RdV28	Vegetation	Bq/sample	Cesium-137	7.13	6.87	4.81-8.93	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-RdV28	Vegetation	Bq/sample	Cobalt-57	8.86	8.68	6.08-11.28	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-RdV28	Vegetation	Bq/sample	Cobalt-60	6.07	5.85	4.10-7.61	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-RdV28	Vegetation	Bq/sample	Manganese-54	-0.002	0.00	False Pos Test	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-RdV28	Vegetation	Bq/sample	Plutonium-238	0.110	0.110	0.077-0.143	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-RdV28	Vegetation	Bq/sample	Pu-239/240	0.113	0.123	0.086-0.160	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-RdV28	Vegetation	Bq/sample	Strontium-90	1.358	1.64	1.15-2.13	Acceptable
MAPEP	2nd/2013	05/13/13	MAPEP-13-RdV28	Vegetation	Bq/sample	Uranium-234/233	0.0081	0.0038	Sens. Eval.	Not Accept.
MAPEP	2nd/2013	05/13/13	MAPEP-13-RdV28	Vegetation	Bq/sample	Uranium-238	0.00489	0.002	Sens. Eval.	Not Accept.
MAPEP	2nd/2013	05/13/13	MAPEP-13-RdV28	Vegetation	Bq/sample	Zinc-65	6.59	6.25	4.38-8.13	Acceptable

PT Provider	Quarter / Year	Analytical Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
ERA	2nd/2013	05/22/13	MRAD-18	Soil	pCi/kg	Actinium-228	1500	1240	795-1720	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Soil	pCi/kg	Americium-241	225	229	134-297	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Soil	pCi/kg	Bismuth-212	1250	1240	330-1820	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Soil	pCi/kg	Bismuth-214	4410	3660	2200-5270	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Soil	pCi/kg	Cesium-134	7850	6370	4160-7650	Not Accept.
ERA	2nd/2013	05/22/13	MRAD-18	Soil	pCi/kg	Cesium-137	8070	6120	4690-7870	Not Accept.
ERA	2nd/2013	05/22/13	MRAD-18	Soil	pCi/kg	Cobalt-60	10300	7920	5360-10900	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Soil	pCi/kg	Lead-212	1290	1240	812-1730	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Soil	pCi/kg	Lead-214	4690	3660	2140-5460	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Soil	pCi/kg	Manganese-54	<63.4	<1000	0-1000	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Soil	pCi/kg	Plutonium-238	651	788.00	474-1090	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Soil	pCi/kg	Plutonium-239	320	366.00	239-506	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Soil	pCi/kg	Potassium-40	10300	10300	7520-13800	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Soil	pCi/kg	Strontium-90	6730	8530	3250-13500	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Soil	pCi/kg	Thorium-234	3290	1900	601-3570	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Soil	pCi/kg	Zinc-65	1910	1400	1110-1860	Not Accept.
ERA	2nd/2013	05/22/13	MRAD-18	Soil	pCi/kg	Strontium-90	6730	8530	3250-13500	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Soil	pCi/kg	Uranium-234	1210	1920	1170-2460	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Soil	pCi/kg	Uranium-238	1630	1900	1180-2410	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Soil	pCi/kg	Uranium-Total	2840	3920	2130-5170	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Soil	ug/kg	Uranium-Total(mass)	4150	5710	3150-7180	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Vegetation	pCi/kg	Americium-241	629	553	338-735	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Vegetation	pCi/kg	Cesium-134	1400	1240	797-1610	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Vegetation	pCi/kg	Cesium-137	687	544	394-757	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Vegetation	pCi/kg	Cobalt-60	2410	1920	1320-2680	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Vegetation	pCi/kg	Curium-244	1420	1340	657-2090	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Vegetation	pCi/kg	Manganese-54	<47.4	<300	0.00-300	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Vegetation	pCi/kg	Plutonium-238	2060	1980	1180-2710	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Vegetation	pCi/kg	Plutonium-239	2230	2260	1390-3110	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Vegetation	pCi/kg	Potassium-40	35600	31900	23000-44800	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Vegetation	pCi/kg	Strontium-90	3720	3840	2190-5090	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Vegetation	pCi/kg	Uranium-234	2650	2460	1620-3160	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Vegetation	pCi/kg	Uranium-238	2580	2440	1630-3100	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Vegetation	pCi/kg	Uranium-Total	5361	5010	3390-6230	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Vegetation	ug/kg	Uranium-Total(mass)	7740	7310	4900-9280	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Vegetation	pCi/kg	Zinc-65	1150	878	633-1230	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Filter	pCi/Filter	Americium-241	62.9	66.8	41.2-90.4	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Filter	pCi/Filter	Cesium-134	1080	1110	706-1380	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Filter	pCi/Filter	Cesium-137	971	940	706-1230	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Filter	pCi/Filter	Cobalt-60	217	214	166-267	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Filter	pCi/Filter	Iron-55	224	225	69.8-440	Acceptable

PT Provider	Quarter / Year	Analytical Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
ERA	2nd/2013	05/22/13	MRAD-18	Filter	pCi/Filter	Manganese-54	<5.27	<50.0	0-50.0	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Filter	pCi/Filter	Plutonium-238	48.0	50.1	34.3-65.9	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Filter	pCi/Filter	Plutonium-239	62.7	65.2	47.2-85.2	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Filter	pCi/Filter	Strontium-90	139	138	67.4-207	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Filter	pCi/Filter	Uranium-234	54.5	59.4	36.8-89.6	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Filter	pCi/Filter	Uranium-238	58.5	58.9	38.1-81.4	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Filter	pCi/Filter	Uranium-Total	117	121	67.0-184	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Filter	ug/Filter	Uranium-Total(mass)	176	176	113-248	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Filter	pCi/Filter	Zinc-65	222	199	142-275	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Filter	pCi/Filter	Gross Alpha	55.5	42.3	14.2-65.7	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Filter	pCi/Filter	Gross Beta	31	25.1	15.9-36.6	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Water	pCi/L	Americium-241	118	118	79.5-158	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Water	pCi/L	Cesium-134	1320	1400	1030-1610	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Water	pCi/L	Cesium-137	1900	1880	1600-2250	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Water	pCi/L	Cobalt-60	2370	2270	1970-2660	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Water	pCi/L	Iron-55	812	712	424-966	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Water	pCi/L	Manganese-54	<7.6	<100	0.00-100	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Water	pCi/L	Plutonium-238	91	99	73.1-123	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Water	pCi/L	Plutonium-239	161	185	144-233	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Water	pCi/L	Strontium-90	144	137	89.2-181	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Water	pCi/L	Uranium-234	47.3	48.8	36.7-62.9	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Water	pCi/L	Uranium-238	50.8	48.4	36.9-59.4	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Water	pCi/L	Uranium-Total	98.1	99.5	73.1-129	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Water	ug/L	Uranium-Total(mass)	152	145	116-175	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Water	pCi/L	Zinc-65	428	384	320-484	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Water	pCi/L	Gross Alpha	138.0	130	46.2-201	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Water	pCi/L	Gross Beta	87	78.9	45.2-117	Acceptable
ERA	2nd/2013	05/22/13	MRAD-18	Water	pCi/L	Tritium	13100	12300	8240-17500	Acceptable
EZA	2nd/2013	08/02/13	E10577	Cartridge	pCi	Iodine-131	9.16E+01	9.55E+01	1.02	Acceptable
EZA	2nd/2013	08/02/13	E10578	Milk	pCi/L	Strontium-89	9.27E+01	9.04E+01	0.98	Acceptable
EZA	2nd/2013	08/02/13	E10578	Milk	pCi/L	Strontium-90	1.20E+01	1.70E+01	0.7	Acceptable
EZA	2nd/2013	08/02/13	E10579	Milk	pCi/L	Iodine-131	9.86E+01	9.55E+01	1.03	Acceptable
EZA	2nd/2013	08/02/13	E10579	Milk	pCi/L	Cerium-141	9.44E+01	9.04E+01	1.04	Acceptable
EZA	2nd/2013	08/02/13	E10579	Milk	pCi/L	Chromium-51	2.58E+02	2.50E+02	1.03	Acceptable
EZA	2nd/2013	08/02/13	E10579	Milk	pCi/L	Cesium-134	1.21E+02	1.25E+02	0.97	Acceptable
EZA	2nd/2013	08/02/13	E10579	Milk	pCi/L	Cesium-137	1.49E+02	1.51E+02	0.99	Acceptable
EZA	2nd/2013	08/02/13	E10579	Milk	pCi/L	Cobalt-58	9.44E+01	9.40E+01	1.00	Acceptable
EZA	2nd/2013	08/02/13	E10579	Milk	pCi/L	Manganese-54	1.80E+02	1.72E+02	1.05	Acceptable
EZA	2nd/2013	08/02/13	E10579	Milk	pCi/L	Iron-59	1.36E+02	1.20E+02	1.14	Acceptable
EZA	2nd/2013	08/02/13	E10579	Milk	pCi/L	Zinc-65	2.39E+02	2.17E+02	1.10	Acceptable
EZA	2nd/2013	08/02/13	E10579	Milk	pCi/L	Cobalt-60	1.77E+02	1.75E+02	1.01	Acceptable

PT Provider	Quarter / Year	Analytical Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
EZA	2nd/2013	08/02/13	E10178	Water	pCi/L	Iodine-131	9.33E+01	9.54E+01	0.98	Acceptable
EZA	2nd/2013	08/02/13	E10178	Water	pCi/L	Cerium-141	1.15E+02	1.10E+02	1.04	Acceptable
EZA	2nd/2013	08/02/13	E10178	Water	pCi/L	Chromium-51	3.40E+02	3.06E+02	1.11	Acceptable
EZA	2nd/2013	08/02/13	E10178	Water	pCi/L	Cesium-134	1.48E+02	1.53E+02	0.97	Acceptable
EZA	2nd/2013	08/02/13	E10178	Water	pCi/L	Cesium-137	1.83E+02	1.84E+02	0.99	Acceptable
EZA	2nd/2013	08/02/13	E10178	Water	pCi/L	Cobalt-58	1.13E+02	1.15E+02	0.99	Acceptable
EZA	2nd/2013	08/02/13	E10178	Water	pCi/L	Manganese-54	2.09E+02	2.10E+02	1.00	Acceptable
EZA	2nd/2013	08/02/13	E10178	Water	pCi/L	Iron-59	1.51E+02	1.46E+02	1.03	Acceptable
EZA	2nd/2013	08/02/13	E10178	Water	pCi/L	Zinc-65	2.86E+02	2.65E+02	1.08	Acceptable
EZA	2nd/2013	08/02/13	E10178	Water	pCi/L	Cobalt-60	2.25E+02	2.14E+02	1.05	Acceptable
ERA	3rd/2013	08/22/13	RAD - 94	Water	pCi/L	Barium-133	76.4	740.5	62.4-82.0	Acceptable
ERA	3rd/2013	08/22/13	RAD - 94	Water	pCi/L	Cesium-134	68.7	72.4	59.1-79.6	Acceptable
ERA	3rd/2013	08/22/13	RAD - 94	Water	pCi/L	Cesium-137	154	155	140-172	Acceptable
ERA	3rd/2013	08/22/13	RAD - 94	Water	pCi/L	Cobalt-60	85.3	82.3	74.1-92.9	Acceptable
ERA	3rd/2013	08/22/13	RAD - 94	Water	pCi/L	Zinc-65	297	260	234-304	Acceptable
ERA	3rd/2013	08/22/13	RAD - 94	Water	pCi/L	Gross Alpha	74.3	57.1	29.8-71.2	Not Acceptable
ERA	3rd/2013	08/22/13	RAD - 94	Water	pCi/L	Gross Beta	34.3	41.8	27.9-49.2	Acceptable
ERA	3rd/2013	08/22/13	RAD - 94	Water	pCi/L	Gross Alpha	67.7	57.1	29.8-71.2	Acceptable
ERA	3rd/2013	08/22/13	RAD - 94	Water	pCi/L	Radium-226	16.9	17.2	12.8-19.7	Acceptable
ERA	3rd/2013	08/22/13	RAD - 94	Water	pCi/L	Radium-226	17	17.2	12.8-19.7	Acceptable
ERA	3rd/2013	08/22/13	RAD - 94	Water	pCi/L	Radium-228	3.53	3.86	2.18-5.4	Acceptable
ERA	3rd/2013	08/22/13	RAD - 94	Water	pCi/L	Uranium (Nat)	20.4	21.4	17.1-24.1	Acceptable
ERA	3rd/2013	08/22/13	RAD - 94	Water	ug/L	Uranium (Nat) mass	30.4	31.2	25.0-35.2	Acceptable
ERA	3rd/2013	08/22/13	RAD - 94	Water	pCi/L	Radium-226	14.6	17.2	12.8-19.7	Acceptable
ERA	3rd/2013	08/22/13	RAD - 94	Water	pCi/L	Uranium (Nat)	21.6	21.4	17.1-24.1	Acceptable
ERA	3rd/2013	08/22/13	RAD - 94	Water	ug/L	Uranium (Nat) mass	33.7	31.2	25-35.2	Acceptable
ERA	3rd/2013	08/22/13	RAD - 94	Water	pCi/L	Tritium	12500	13300	11600-14600	Acceptable
ERA	3rd/2013	08/22/13	RAD - 94	Water	pCi/L	Strontium-89	48.9	36.5	27.4-43.4	Not Acceptable
ERA	3rd/2013	08/22/13	RAD - 94	Water	pCi/L	Strontium-90	14.3	19.8	14.1-23.4	Acceptable
ERA	3rd/2013	08/22/13	RAD - 94	Water	pCi/L	Strontium-89	44.3	36.5	27.4-43.4	Not Acceptable
ERA	3rd/2013	08/22/13	RAD - 94	Water	pCi/L	Strontium-90	17.3	19.8	14.1-23.4	Acceptable
ERA	3rd/2013	08/22/13	RAD - 94	Water	pCi/L	Iodine-131	26.1	24.3	20.2-28.8	Acceptable
ERA	3rd/2013	08/22/13	RAD - 94	Water	pCi/L	Iodine-131	23.3	24.3	20.2-28.8	Acceptable
EZA	3rd/2013	10/25/13	E10625	Cartridge	pCi	Iodine-131	8.57E+01	7.96E+01	1.08	Acceptable
EZA	3rd/2013	10/25/13	E10626	Milk	pCi/L	Strontium-89	9.33E+01	9.60E+01	0.97	Acceptable
EZA	3rd/2013	10/25/13	E10626	Milk	pCi/L	Strontium-90	1.09E+01	1.32E+01	0.83	Acceptable
EZA	3rd/2013	10/25/13	E10627	Milk	pCi/L	Iodine-131	1.00E+02	9.83E+01	1.02	Acceptable
EZA	3rd/2013	10/25/13	E10627	Milk	pCi/L	Chromium-51	3.09E+02	2.77E+02	1.11	Acceptable
EZA	3rd/2013	10/25/13	E10627	Milk	pCi/L	Cesium-134	1.46E+02	1.72E+02	0.85	Acceptable

PT Provider	Quarter / Year	Analytical Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
EZA	3rd/2013	10/25/13	E10627	Milk	pCi/L	Cesium-137	1.33E+02	1.31E+02	1.02	Acceptable
EZA	3rd/2013	10/25/13	E10627	Milk	pCi/L	Cobalt-58	1.04E+02	1.08E+02	0.97	Acceptable
EZA	3rd/2013	10/25/13	E10627	Milk	pCi/L	Manganese-54	1.44E+02	1.39E+02	1.04	Acceptable
EZA	3rd/2013	10/25/13	E10627	Milk	pCi/L	Iron-59	1.43E+02	1.30E+02	1.1	Acceptable
EZA	3rd/2013	10/25/13	E10627	Milk	pCi/L	Zinc-65	2.86E+02	2.66E+02	1.07	Acceptable
EZA	3rd/2013	10/25/13	E10627	Milk	pCi/L	Cobalt-60	2.01E+02	1.96E+02	1.03	Acceptable
EZA	3rd/2013	10/25/13	E10628	Water	pCi/L	Iodine-131	1.01E+02	9.79E+01	1.03	Acceptable
EZA	3rd/2013	10/25/13	E10628	Water	pCi/L	Chromium-51	2.80E+02	2.51E+02	1.12	Acceptable
EZA	3rd/2013	10/25/13	E10628	Water	pCi/L	Cesium-134	1.42E+02	1.56E+02	0.91	Acceptable
EZA	3rd/2013	10/25/13	E10628	Water	pCi/L	Cesium-137	1.19E+02	1.18E+02	1.01	Acceptable
EZA	3rd/2013	10/25/13	E10628	Water	pCi/L	Cobalt-58	9.80E+01	9.73E+01	1.01	Acceptable
EZA	3rd/2013	10/25/13	E10628	Water	pCi/L	Manganese-54	1.29E+02	1.25E+02	1.05	Acceptable
EZA	3rd/2013	10/25/13	E10628	Water	pCi/L	Iron-59	1.23E+02	1.18E+02	1.04	Acceptable
EZA	3rd/2013	10/25/13	E10628	Water	pCi/L	Zinc-65	2.62E+02	2.41E+02	1.09	Acceptable
EZA	3rd/2013	10/25/13	E10628	Water	pCi/L	Cobalt-60	1.87E+02	1.77E+02	1.06	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-GrF29	Filter	Bq/sample	Gross Alpha	1.090	0.900	0.3-1.5	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-GrF29	Filter	Bq/sample	Gross Beta	1.730	1.630	0.82-2.45	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-MaS29	Soil	mg/kg	Americium-241	0.00	0	False Pos Test	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-MaS29	Soil	mg/kg	Cesium-134	1090	1172	820-1524	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-MaS29	Soil	mg/kg	Cesium-137	1010	977	684-1270	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-MaS29	Soil	mg/kg	Cobalt-57	0.0	0	False Pos Test	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-MaS29	Soil	mg/kg	Cobalt-60	462.00	451.00	316-586	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-MaS29	Soil	mg/kg	Iron-55	887	820	574-1066	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-MaS29	Soil	mg/kg	Manganese-54	692	674	472-876	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-MaS29	Soil	mg/kg	Nickel-63	525.0	571	400-742	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-MaS29	Soil	mg/kg	Plutonium-238	60.8	62	43.1-80.0	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-MaS29	Soil	mg/kg	Plutonium-239/240	1.33	0.4	Sens. Eval.	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-MaS29	Soil	mg/kg	Potassium-40	638	633	443-823	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-MaS29	Soil	mg/kg	Strontium-90	458.0	460	322-598	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-MaS29	Soil	mg/kg	Technetium-99	0.0	0	False Pos Test	Acceptable

PT Provider	Quarter / Year	Analytical Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MAPEP	4th/2013	11/12/13	MAPEP-13-MaS29	Soil	mg/kg	Uranium-234/233	26.1	30	21.0-39.0	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-MaS29	Soil	mg/kg	Uranium-238	30.0	34	23.8-44.2	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-MaS29	Soil	mg/kg	Zinc-65	0.0	0	False Pos Test	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-MaW29	Water	Bq/L	Americium-241	0.0001	0.000	False Pos Test	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-MaW29	Water	Bq/L	Cesium-134	27.20	30.0	21.0-39.0	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-MaW29	Water	Bq/L	Cesium-137	31.8	31.6	22.1-41.1	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-MaW29	Water	Bq/L	Cobalt-57	0	0.0	False Pos Test	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-MaW29	Water	Bq/L	Cobalt-60	23.60	23.6	16.51-30.65	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-MaW29	Water	Bq/L	Hydrogen-3	-3.5	0	False Pos Test	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-MaW29	Water	Bq/L	Iron-55	53.00	53.3	37.3-69.3	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-MaW29	Water	Bq/L	Manganese-54	-0.009	0.0	False Pos Test	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-MaW29	Water	Bq/L	Nickel-63	27.7	26.4	18.5-34.3	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-MaW29	Water	Bq/L	Plutonium-238	1.070	1.216	0.851-1.581	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-MaW29	Water	Bq/L	Plutonium-239/240	0.907	0.996	0.697-1.295	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-MaW29	Water	Bq/L	Potassium-40	0.339	0	False Pos Test	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-MaW29	Water	Bq/L	Strontium-90	6.65	7.22	5.05-9.39	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-MaW29	Water	Bq/L	Technetium-99	15.4	16.20	11.3-21.1	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-MaW29	Water	Bq/L	Uranium-234/233	0.065	0.07	Sens. Eval.	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-MaW29	Water	Bq/L	Uranium-238	0.031	0.034	Sens. Eval.	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-MaW29	Water	Bq/L	Zinc-65	36.500	34.60	24.2-45.0	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-MaW29	Water	Bq/L	Gross Alpha	0.793	0.701	0.201-1.192	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-MaW29	Water	Bq/L	Gross Beta	6.220	5.94	2.97-8.91	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-RdF29	Filter	ug/sample	Uranium-235	0.034	0.032	0.0227-0.0421	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-RdF29	Filter	ug/sample	Uranium-238	15.8	16.5	11.6-21.5	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-RdF29	Filter	ug/sample	Uranium-Total	15.80	16.5	11.6-21.5	Acceptable

PT Provider	Quarter / Year	Analytical Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MAPEP	4th/2013	11/12/13	MAPEP-13-RdF29	Filter	ug/sample	Americium-241	0.0002	0.000	False Pos Test	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-RdF29	Filter	Bq/sample	Cesium-134	-0.0016	0.00	False Pos Test	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-RdF29	Filter	Bq/sample	Cesium-137	3.010	2.70	1.9-3.5	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-RdF29	Filter	Bq/sample	Cobalt-57	3.530	3.40	2.4-4.4	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-RdF29	Filter	Bq/sample	Cobalt-60	2.440	2.30	1.6-3.0	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-RdF29	Filter	Bq/sample	Manganese-54	3.720	3.50	2.5-4.6	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-RdF29	Filter	Bq/sample	Plutonium-238	0.128	0.124	0.087-0.161	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-RdF29	Filter	Bq/sample	Plutonium-239/240	0.092	0.0920	0.064-0.12	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-RdF29	Filter	Bq/sample	Strontium-90	1.690	1.81	1.27-2.35	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-RdF29	Filter	Bq/sample	Uranium-234/233	0.027	0.0292	0.0204-0.038	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-RdF29	Filter	Bq/sample	Uranium-238	0.020	0.021	0.144-0.267	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-RdF29	Filter	Bq/sample	Zinc-65	3.050	2.70	1.9-3.5	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-RdV29	Vegetation	Bq/sample	Americium-241	0.226	0.19	0.135-0.251	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-RdV29	Vegetation	Bq/sample	Cesium-134	4.750	5.20	3.64-6.67	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-RdV29	Vegetation	Bq/sample	Cesium-137	6.910	6.60	4.62-8.58	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-RdV29	Vegetation	Bq/sample	Cobalt-57	-0.002	0.00	False Pos Test	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-RdV29	Vegetation	Bq/sample	Cobalt-60	0.008	0.00	False Pos Test	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-RdV29	Vegetation	Bq/sample	Manganese-54	7.980	7.88	5.52-10.24	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-RdV29	Vegetation	Bq/sample	Plutonium-238	0.001	0.001	Sens. Eval.	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-RdV29	Vegetation	Bq/sample	Plutonium-239/240	0.1510	0.171	0.120-0.222	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-RdV29	Vegetation	Bq/sample	Strontium-90	2.330	2.32	1.62-3.02	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-RdV29	Vegetation	Bq/sample	Uranium-234/233	0.046	0.047	0.0326-0.0606	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-RdV29	Vegetation	Bq/sample	Uranium-238	0.332	0.324	0.227-0.421	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-RdV29	Vegetation	Bq/sample	Zinc-65	2.850	2.63	1.84-3.42	Acceptable
MAPEP	4th/2013	11/12/13	MAPEP-13-XaW29	Water	Bq/L	Iodine-129	3.62	3.79	2.65-4.93	Acceptable

PT Provider	Quarter / Year	Analytical Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
ERA	4th/2013	11/26/13	MRAD-19	Soil	pCi/kg	Actinium-228	1200	1240	795-1720	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Soil	pCi/kg	Americium-241	186	164	95.9-213	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Soil	pCi/kg	Bismuth-212	1760	1220	325-1790	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Soil	pCi/kg	Bismuth-214	4350	3740	2250-5380	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Soil	pCi/kg	Cesium-134	2690	2820	1840-3390	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Soil	pCi/kg	Cesium-137	3960	4130	3160-5310	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Soil	pCi/kg	Cobalt-60	5490	5680	3840-7820	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Soil	pCi/kg	Lead-212	1260	1220	799-1700	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Soil	pCi/kg	Lead-214	4700	3740	2180-5580	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Soil	pCi/kg	Manganese-54	<55.2	<1000	0-1000	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Soil	pCi/kg	Plutonium-238	576	658	396-908	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Soil	pCi/kg	Plutonium-239	400	397	260-548	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Soil	pCi/kg	Potassium-40	11200	12400	9080-16700	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Soil	pCi/kg	Strontium-90	8220	6860	2620-10800	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Soil	pCi/kg	Thorium-234	2870	3080	974-5790	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Soil	pCi/kg	Zinc-65	3400	3160	2520-4200	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Soil	pCi/kg	Uranium-234	2870	3080	974-5790	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Soil	pCi/kg	Uranium-238	2979	3080	1910-3910	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Soil	pCi/kg	Uranium-Total	6870	6320	3430-8340	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Soil	ug/kg	Uranium-Total(mass)	8460	9220	5080-11600	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Vegetation	pCi/kg	Americium-241	3800	3630	2220-4830	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Vegetation	pCi/kg	Cesium-134	907	859	552-1120	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Vegetation	pCi/kg	Cesium-137	1220	1030	747-1430	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Vegetation	pCi/kg	Cobalt-60	2100	1880	1300-2630	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Vegetation	pCi/kg	Curium-244	1230	1250	612-1950	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Vegetation	pCi/kg	Manganese-54	<53.3	<300	0-300	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Vegetation	pCi/kg	Plutonium-238	1280	1290	769-1770	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Vegetation	pCi/kg	Plutonium-239	2580	2770	1700-3810	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Vegetation	pCi/kg	Potassium-40	33600	33900	24500-47600	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Vegetation	pCi/kg	Strontium-90	5870	6360	3630-8430	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Vegetation	pCi/kg	Uranium-234	674	654	430-840	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Vegetation	pCi/kg	Uranium-234	1050	654	430-840	Not Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Vegetation	pCi/kg	Uranium-238	655	648	432-823	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Vegetation	pCi/kg	Uranium-Total	1364	1330	901-1660	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Vegetation	pCi/kg	Uranium-Total	1773	1330	901-1660	Not Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Vegetation	ug/kg	Uranium-Total(mass)	1960	1940	1300-2460	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Vegetation	pCi/kg	Zinc-65	1990	1540	1110-2160	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Filter	pCi/Filter	Americium-241	75.2	66.4	40.9-89.9	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Filter	pCi/Filter	Cesium-134	845	868.0	552-1080	Acceptable

PT Provider	Quarter / Year	Analytical Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
ERA	4th/2013	11/26/13	MRAD-19	Filter	pCi/Filter	Cesium-137	641	602	452-791	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Filter	pCi/Filter	Cobalt-60	534	494	382-617	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Filter	pCi/Filter	Iron-55	466	389.0	121-760	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Filter	pCi/Filter	Manganese-54	<3.9	<50	0.00-50.0	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Filter	ug/Filter	Plutonium-238	72.8	68.5	46.9-90.1	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Filter	pCi/Filter	Plutonium-239	56.5	53.4	42.4-93.1	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Filter	pCi/Filter	Strontium-90	130	125	61.1-187	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Filter	pCi/Filter	Uranium-234	56	87	35.6-86.6	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Filter	pCi/Filter	Uranium-238	58	56.90	36.8-78.7	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Filter	pCi/Filter	Uranium-Total	116	117	64.8-178	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Filter	ug/Filter	Uranium-Total(mass)	172	171	109-241	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Filter	pCi/Filter	Zinc-65	514	419	300-578	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Filter	ug/Filter	Uranium-Total(mass)	169	171	109-241	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Filter	ug/Filter	Uranium-Total(mass)	150	171	109-241	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Filter	pCi/Filter	Gross Alpha	100	83	27.8-129	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Filter	pCi/Filter	Gross Beta	65.7	56.3	35.6-82.2	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Water	pCi/L	Americium-241	126	126	84.9-169	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Water	pCi/L	Cesium-134	2060.0	2180	1600-2510	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Water	pCi/L	Cesium-137	2730	2760	2340-3310	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Water	pCi/L	Cobalt-60	1960	1890	1640-2210	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Water	pCi/L	Iron-55	721	689	411-935	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Water	pCi/L	Manganese-54	<7.24	<100	0.00-100	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Water	pCi/L	Plutonium-238	133	138	102-172	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Water	pCi/L	Plutonium-239	98.7	109	84.6-137	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Water	pCi/L	Strontium-90	726	788	513-1040	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Water	pCi/L	Uranium-234	93	99	74.3-128	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Water	pCi/L	Uranium-238	93	98.00	74.7-120	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Water	pCi/L	Uranium-Total	186	201	148-260	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Water	ug/L	Uranium-Total(mass)	278	294	234-355	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Water	pCi/L	Zinc-65	1560	1370	1140-1730	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Water	pCi/L	Gross Alpha	105.0	97	34.3-150	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Water	pCi/L	Gross Beta	78.8	84.5	48.4-125	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Water	pCi/L	Tritium	8740	9150	6130-13000	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Water	pCi/L	Uranium-234	92.4	98.9	74.3-128	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Water	pCi/L	Uranium-238	96.1	98.0	74.7-120	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Water	pCi/L	Uranium-Total	193	201	148-260	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Water	ug/L	Uranium-Total(mass)	288	294	234-355	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Water	pCi/L	Uranium-234	95.2	98.9	74.3-128	Acceptable

PT Provider	Quarter / Year	Analytical Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
ERA	4th/2013	11/26/13	MRAD-19	Water	pCi/L	Uranium-238	115	98.00	74.7-120	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Water	pCi/L	Uranium-Total	215	201	148-260	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Water	ug/L	Uranium-Total(mass)	344	294	234-355	Acceptable
ERA	4th/2013	11/26/13	MRAD-19	Water	ug/L	Uranium-Total(mass)	258	294	234-355	Acceptable

TABLE 2

2013 ECKERT & ZIEGLER ANALYTICS PERFORMANCE EVALUATION RESULTS

Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
02/01/13	E10323	Cartridge	pCi	Iodine-131	7.31E+01	7.29E+01	1.00	Acceptable
02/01/13	E10324	Milk	pCi/L	Strontium-89	9.89E+00	1.38E+01	0.72	Acceptable
02/01/13	E10324	Milk	pCi/L	Strontium-90	9.83E+00	1.48E+01	1.02	Acceptable
02/01/13	E10325	Milk	pCi/L	Iodine-131	9.57E+01	9.00E+01	1.06	Acceptable
02/01/13	E10325	Milk	pCi/L	Chromium-51	3.67E+02	3.48E+02	1.06	Acceptable
02/01/13	E10325	Milk	pCi/L	Cesium-134	1.54E+02	1.65E+02	0.93	Acceptable
02/01/13	E10325	Milk	pCi/L	Cesium-137	1.18E+02	1.17E+02	1.01	Acceptable
02/01/13	E10325	Milk	pCi/L	Cobalt-58	9.85E+01	9.85E+01	1	Acceptable
02/01/13	E10325	Milk	pCi/L	Manganese-54	1.16E+02	1.16E+02	1	Acceptable
02/01/13	E10325	Milk	pCi/L	Iron-59	1.33E+02	1.16E+02	1.15	Acceptable
02/01/13	E10325	Milk	pCi/L	Zinc-65	3.19E+02	2.91E+02	1.09	Acceptable
02/01/13	E10325	Milk	pCi/L	Cobalt-60	1.73E+02	1.70E+02	1.02	Acceptable
02/01/13	E10325	Milk	pCi/L	Cesium-141	5.38E+01	5.10E+01	1.05	Acceptable
02/01/13	E10380	Water	pCi/L	Iodine-131	7.47E+01	7.25E+01	1.03	Acceptable
02/01/13	E10380	Water	pCi/L	Chromium-51	3.81E+02	3.62E+02	1.05	Acceptable
02/01/13	E10380	Water	pCi/L	Cesium-134	1.57E+02	1.73E+02	0.91	Acceptable
02/01/13	E10380	Water	pCi/L	Cesium-137	1.25E+02	1.22E+02	1.03	Acceptable
02/01/13	E10380	Water	pCi/L	Cobalt-58	1.02E+02	1.03E+02	0.99	Acceptable
02/01/13	E10380	Water	pCi/L	Manganese-54	1.28E+02	1.21E+02	1.06	Acceptable
02/01/13	E10380	Water	pCi/L	Iron-59	1.38E+02	1.21E+02	1.14	Acceptable
02/01/13	E10380	Water	pCi/L	Zinc-65	2.13E+02	1.94E+02	1.1	Acceptable
02/01/13	E10380	Water	pCi/L	Cobalt-60	1.80E+02	1.77E+02	1.01	Acceptable
04/25/13	E10469	Cartridge	pCi	Iodine-131	9.38E+01	9.27E+01	1.01	Acceptable
04/25/13	E10470	Milk	pCi/L	Strontium-89	1.07E+02	9.97E+01	1.07	Acceptable
04/25/13	E10470	Milk	pCi/L	Strontium-90	1.18E+01	1.10E+01	1.07	Acceptable
04/25/13	E10471	Milk	pCi/L	Iodine-131	1.12E+02	1.00E+02	1.12	Acceptable
04/25/13	E10471	Milk	pCi/L	Cerium-141	2.00E+01	1.87E+01	1.07	Acceptable
04/25/13	E10471	Milk	pCi/L	Cr-51	5.09E+01	4.72E+01	1.08	Acceptable
04/25/13	E10471	Milk	pCi/L	Cesium-134	2.06E+02	2.14E+02	0.96	Acceptable
04/25/13	E10471	Milk	pCi/L	Cesium-137	2.83E+02	2.66E+02	1.07	Acceptable
04/25/13	E10471	Milk	pCi/L	Cobalt-58	2.19E+02	2.08E+02	1.05	Acceptable
04/25/13	E10471	Milk	pCi/L	Mn-54	2.21E+02	2.08E+02	1.06	Acceptable
04/25/13	E10471	Milk	pCi/L	Iron-59	2.78E+02	2.52E+02	1.1	Acceptable
04/25/13	E10471	Milk	pCi/L	Zinc-65	3.39E+02	3.01E+02	1.13	Acceptable
04/25/13	E10471	Milk	pCi/L	Cobalt-60	4.02E+02	4.00E+02	1.01	Acceptable
04/25/13	E10472	Water	pCi/L	Iodine-131	1.12E+02	9.28E+01	1.21	Acceptable
04/25/13	E10472	Water	pCi/L	Cerium-141	1.88E+02	1.79E+02	1.05	Acceptable
04/25/13	E10472	Water	pCi/L	Cr-51	4.84E+02	4.52E+02	1.07	Acceptable
04/25/13	E10472	Water	pCi/L	Cesium-134	1.96E+02	2.05E+02	0.96	Acceptable
04/25/13	E10472	Water	pCi/L	Cesium-137	2.71E+02	2.54E+02	1.07	Acceptable
04/25/13	E10472	Water	pCi/L	Cobalt-58	2.03E+02	1.99E+02	1.02	Acceptable
04/25/13	E10472	Water	pCi/L	Mn-54	2.15E+02	1.99E+02	1.08	Acceptable
04/25/13	E10472	Water	pCi/L	Iron-59	2.67E+02	2.41E+02	1.11	Acceptable

Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
04/25/13	E10472	Water	pCi/L	Zinc-65	3.14E+02	2.88E+02	1.09	Acceptable
04/25/13	E10472	Water	pCi/L	Cobalt-60	3.92E+02	3.83E+02	1.02	Acceptable
08/02/13	E10577	Cartridge	pCi	Iodine-131	9.16E+01	9.55E+01	1.02	Acceptable
08/02/13	E10578	Milk	pCi/L	Strontium-89	9.27E+01	9.04E+01	0.98	Acceptable
08/02/13	E10578	Milk	pCi/L	Strontium-90	1.20E+01	1.70E+01	0.7	Acceptable
08/02/13	E10579	Milk	pCi/L	Iodine-131	9.86E+01	9.55E+01	1.03	Acceptable
08/02/13	E10579	Milk	pCi/L	Cerium-141	9.44E+01	9.04E+01	1.04	Acceptable
08/02/13	E10579	Milk	pCi/L	Chromium-51	2.58E+02	2.50E+02	1.03	Acceptable
08/02/13	E10579	Milk	pCi/L	Cesium-134	1.21E+02	1.25E+02	0.97	Acceptable
08/02/13	E10579	Milk	pCi/L	Cesium-137	1.49E+02	1.51E+02	0.99	Acceptable
08/02/13	E10579	Milk	pCi/L	Cobalt-58	9.44E+01	9.40E+01	1.00	Acceptable
08/02/13	E10579	Milk	pCi/L	Manganese-54	1.80E+02	1.72E+02	1.05	Acceptable
08/02/13	E10579	Milk	pCi/L	Iron-59	1.36E+02	1.20E+02	1.14	Acceptable
08/02/13	E10579	Milk	pCi/L	Zinc-65	2.39E+02	2.17E+02	1.10	Acceptable
08/02/13	E10579	Milk	pCi/L	Cobalt-60	1.77E+01	1.75E+02	1.01	Acceptable
08/02/13	E10178	Water	pCi/L	Iodine-131	9.33E+01	9.54E+01	0.98	Acceptable
08/02/13	E10178	Water	pCi/L	Cerium-141	1.15E+02	1.10E+02	1.04	Acceptable
08/02/13	E10178	Water	pCi/L	Chromium-51	3.40E+02	3.06E+02	1.11	Acceptable
08/02/13	E10178	Water	pCi/L	Cesium-134	1.48E+02	1.53E+02	0.97	Acceptable
08/02/13	E10178	Water	pCi/L	Cesium-137	1.83E+02	1.84E+02	0.99	Acceptable
08/02/13	E10178	Water	pCi/L	Cobalt-58	1.13E+02	1.15E+02	0.99	Acceptable
08/02/13	E10178	Water	pCi/L	Manganese-54	2.09E+02	2.10E+02	1.00	Acceptable
08/02/13	E10178	Water	pCi/L	Iron-59	1.51E+02	1.46E+02	1.03	Acceptable
08/02/13	E10178	Water	pCi/L	Zinc-65	2.86E+02	2.65E+02	1.08	Acceptable
08/02/13	E10178	Water	pCi/L	Cobalt-60	2.25E+02	2.14E+02	1.05	Acceptable
10/25/13	E10625	Cartridge	pCi	Iodine-131	8.57E+01	7.96E+01	1.08	Acceptable
10/25/13	E10626	Milk	pCi/L	Strontium-89	9.33E+01	9.60E+01	0.97	Acceptable
10/25/13	E10626	Milk	pCi/L	Strontium-90	1.09E+01	1.32E+01	0.83	Acceptable
10/25/13	E10627	Milk	pCi/L	Iodine-131	1.00E+02	9.83E+01	1.02	Acceptable
10/25/13	E10627	Milk	pCi/L	Chromium-51	3.09E+02	2.77E+02	1.11	Acceptable
10/25/13	E10627	Milk	pCi/L	Cesium-134	1.46E+02	1.72E+02	0.85	Acceptable
10/25/13	E10627	Milk	pCi/L	Cesium-137	1.33E+02	1.31E+02	1.02	Acceptable
10/25/13	E10627	Milk	pCi/L	Cobalt-58	1.04E+02	1.08E+02	0.97	Acceptable
10/25/13	E10627	Milk	pCi/L	Manganese-54	1.44E+02	1.39E+02	1.04	Acceptable
10/25/13	E10627	Milk	pCi/L	Iron-59	1.43E+02	1.30E+02	1.1	Acceptable
10/25/13	E10627	Milk	pCi/L	Zinc-65	2.86E+02	2.66E+02	1.07	Acceptable
10/25/13	E10627	Milk	pCi/L	Cobalt-60	2.01E+02	1.96E+02	1.03	Acceptable
10/25/13	E10628	Water	pCi/L	Iodine-131	1.01E+02	9.79E+01	1.03	Acceptable
10/25/13	E10628	Water	pCi/L	Chromium-51	2.80E+02	2.51E+02	1.12	Acceptable
10/25/13	E10628	Water	pCi/L	Cesium-134	1.42E+02	1.56E+02	0.91	Acceptable
10/25/13	E10628	Water	pCi/L	Cesium-137	1.19E+02	1.18E+02	1.01	Acceptable
10/25/13	E10628	Water	pCi/L	Cobalt-58	9.80E+01	9.73E+01	1.01	Acceptable
10/25/13	E10628	Water	pCi/L	Manganese-54	1.29E+02	1.25E+02	1.05	Acceptable
10/25/13	E10628	Water	pCi/L	Iron-59	1.23E+02	1.18E+02	1.04	Acceptable
10/25/13	E10628	Water	pCi/L	Zinc-65	2.62E+02	2.41E+02	1.09	Acceptable
10/25/13	E10628	Water	pCi/L	Cobalt-60	1.87E+02	1.77E+02	1.06	Acceptable

TABLE 3

2013 DEPARTMENT OF ENERGY MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP) RESULTS

Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
02/27/13	GENE01-27-RdFR1	Filter	Bq/sample	U-234/233	0.0143	0.0155	0.0109-0.0202	Acceptable
02/27/13	GENE01-27-RdFR1	Filter	Bq/sample	Uranium-238	0.0999	0.098	0.069-0.127	Acceptable
05/13/13	MAPEP-13-GrF28	Filter	Bq/sample	Gross Alpha	0.656	1.20	0.36-2.04	Acceptable
05/13/13	MAPEP-13-GrF28	Filter	Bq/sample	Gross Beta	0.954	0.85	0.43-1.28	Acceptable
05/13/13	MAPEP-13-MaS28	Soil	mg/kg	Americium-241	118	113	79-147	Acceptable
05/13/13	MAPEP-13-MaS28	Soil	mg/kg	Cesium-134	829	887	621-1153	Acceptable
05/13/13	MAPEP-13-MaS28	Soil	mg/kg	Cesium-137	623	587	411-763	Acceptable
05/13/13	MAPEP-13-MaS28	Soil	mg/kg	Cobalt-57	1.04	0	False Pos Test	Acceptable
05/13/13	MAPEP-13-MaS28	Soil	mg/kg	Cobalt-60	737	691	484-898	Acceptable
05/13/13	MAPEP-13-MaS28	Soil	mg/kg	Iron-55	-0.380	0	False Pos Test	Acceptable
05/13/13	MAPEP-13-MaS28	Soil	mg/kg	Manganese-54	0.760	0	False Pos Test	Acceptable
05/13/13	MAPEP-13-MaS28	Soil	mg/kg	Nickel-63	719	670	469-871	Acceptable
05/13/13	MAPEP-13-MaS28	Soil	mg/kg	Plutonium-238	0.571	0.52	Sens. Eval.	Acceptable
05/13/13	MAPEP-13-MaS28	Soil	mg/kg	Plutonium-239/240	77.70	79.5	55.7-103.4	Acceptable
05/13/13	MAPEP-13-MaS28	Soil	mg/kg	Potassium-40	713	625	438-813	Acceptable
05/13/13	MAPEP-13-MaS28	Soil	mg/kg	Strontium-90	693.0	628	440-816	Acceptable
05/13/13	MAPEP-13-MaS28	Soil	mg/kg	Technetium-99	419.0	444	311-577	Acceptable
05/13/13	MAPEP-13-MaS28	Soil	mg/kg	U-234/233	60.0	62.5	43.8-81.3	Acceptable
05/13/13	MAPEP-13-MaS28	Soil	mg/kg	Uranium-238	274	281	197-365	Acceptable
05/13/13	MAPEP-13-MaS28	Soil	mg/kg	Zinc-65	1130	995	697-1294	Acceptable
05/13/13	MAPEP-13-MaW28	Water	Bq/L	Am-241	0.690	0.689	0.428-0.896	Acceptable
05/13/13	MAPEP-13-MaW28	Water	Bq/L	Cesium-134	21.1	24.4	17.1-31.7	Acceptable
05/13/13	MAPEP-13-MaW28	Water	Bq/L	Cesium-137	0.10	0.0	False Pos Test	Acceptable
05/13/13	MAPEP-13-MaW28	Water	Bq/L	Cobalt-57	31.0	30.9	21.6-40.2	Acceptable
05/13/13	MAPEP-13-MaW28	Water	Bq/L	Cobalt-60	19.4	19.6	13.7-25.4	Acceptable
05/13/13	MAPEP-13-MaW28	Water	Bq/L	Hydrogen-3	517	507	355-659	Acceptable
05/13/13	MAPEP-13-MaW28	Water	Bq/L	Iron-55	39.7	44.0	30.8-57.2	Acceptable
05/13/13	MAPEP-13-MaW28	Water	Bq/L	Manganese-54	28.0	27.4	19.2-35.6	Acceptable
05/13/13	MAPEP-13-MaW28	Water	Bq/L	Nickel-63	32.9	33.4	23.4-43.4	Acceptable
05/13/13	MAPEP-13-MaW28	Water	Bq/L	Plutonium-238	0.825	0.884	0.619-1.149	Acceptable
05/13/13	MAPEP-13-MaW28	Water	Bq/L	Pu-239/240	0.0162	0.0096	Sens. Eval.	Acceptable
05/13/13	MAPEP-13-MaW28	Water	Bq/L	Potassium-40	-0.471	0	False Pos Test	Acceptable
05/13/13	MAPEP-13-MaW28	Water	Bq/L	Strontium-90	12.5	10.5	7.4-13.7	Acceptable
05/13/13	MAPEP-13-MaW28	Water	Bq/L	Technetium-99	12.9	13.1	9.2-17.0	Acceptable
05/13/13	MAPEP-13-MaW28	Water	Bq/L	U-234/233	0.289	0.315	0.221-0.410	Acceptable
05/13/13	MAPEP-13-MaW28	Water	Bq/L	Uranium-238	1.81	1.95	1.37-2.54	Acceptable
05/13/13	MAPEP-13-MaW28	Water	Bq/L	Zinc-65	32.8	30.4	21.3-39.5	Acceptable
05/13/13	MAPEP-13-GrW28	Water	Bq/L	Gross Alpha	2.60	2.31	0.69-3.93	Acceptable
05/13/13	MAPEP-13-GrW28	Water	Bq/L	Gross Beta	14.2	13.0	6.5-19.5	Acceptable
05/13/13	MAPEP-13-XaW28	Water	Bq/L	Iodine-129	5.94	6.06	4.24-7.88	Acceptable
05/13/13	MAPEP-13-RdF28	Filter	ug/sample	Uranium-235	0.036	0.036	0.025-0.047	Acceptable

Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
05/13/13	MAPEP-13-RdF28	Filter	ug/sample	Uranium-238	18.0	18.6	13.0-24.2	Acceptable
05/13/13	MAPEP-13-RdF28	Filter	ug/sample	Uranium-Total	17.7	18.6	13.0-24.2	Acceptable
05/13/13	MAPEP-13-RdF28	Filter	ug/sample	Americium-241	0.106	0.104	0.073-0.135	Acceptable
05/13/13	MAPEP-13-RdF28	Filter	Bq/sample	Cesium-134	1.75	1.78	1.25-2.31	Acceptable
05/13/13	MAPEP-13-RdF28	Filter	Bq/sample	Cesium-137	2.71	2.60	1.82-3.38	Acceptable
05/13/13	MAPEP-13-RdF28	Filter	Bq/sample	Cobalt-57	2.51	2.36	1.65-3.07	Acceptable
05/13/13	MAPEP-13-RdF28	Filter	Bq/sample	Cobalt-60	0.005	0.00	False PosTest	Acceptable
05/13/13	MAPEP-13-RdF28	Filter	Bq/sample	Manganese-54	4.43	4.26	2.98-5.54	Acceptable
05/13/13	MAPEP-13-RdF28	Filter	Bq/sample	Plutonium-238	0.124	0.127	0.089-0.165	Acceptable
05/13/13	MAPEP-13-RdF28	Filter	Bq/sample	Pu-239/240	0.118	0.1210	0.085-0.157	Acceptable
05/13/13	MAPEP-13-RdF28	Filter	Bq/sample	Strontium-90	1.54	1.49	1.04-1.94	Acceptable
05/13/13	MAPEP-13-RdF28	Filter	Bq/sample	U-234/233	0.0342	0.0318	0.0223-0.0413	Acceptable
05/13/13	MAPEP-13-RdF28	Filter	Bq/sample	Uranium-238	0.230	0.231	0.162-0.300	Acceptable
05/13/13	MAPEP-13-RdF28	Filter	Bq/sample	Zinc-65	3.38	3.13	2.19-4.07	Acceptable
05/13/13	MAPEP-13-GrF28	Filter	Bq/sample	Gross Alpha	0.656	1.20	0.36-2.04	Acceptable
05/13/13	MAPEP-13-GrF28	Filter	Bq/sample	Gross Beta	0.95	0.85	0.43-1.28	Acceptable
05/13/13	MAPEP-13-RdF28	Filter	Bq/sample	Americium-241	0.106	0.104	0.073-0.135	Acceptable
05/13/13	MAPEP-13-RdV28	Vegetation	ug/sample	Uranium-235	0.0029	0.001	0.0009-0.0017	Not Accept.
05/13/13	MAPEP-13-RdV28	Vegetation	ug/sample	Uranium-238	0.419	0.180	0.13-0.23	Not Accept.
05/13/13	MAPEP-13-RdV28	Vegetation	ug/sample	Uranium-Total	0.4219	0.180	0.13-0.23	Not Accept.
05/13/13	MAPEP-13-RdV28	Vegetation	ug/sample	Americium-241	0.1350	0.140	0.098-0.182	Acceptable
05/13/13	MAPEP-13-RdV28	Vegetation	Bq/sample	Cesium-134	0.0525	0.00	False Pos Test	Acceptable
05/13/13	MAPEP-13-RdV28	Vegetation	Bq/sample	Cesium-137	7.13	6.87	4.81-8.93	Acceptable
05/13/13	MAPEP-13-RdV28	Vegetation	Bq/sample	Cobalt-57	8.86	8.68	6.08-11.28	Acceptable
05/13/13	MAPEP-13-RdV28	Vegetation	Bq/sample	Cobalt-60	6.07	5.85	4.10-7.61	Acceptable
05/13/13	MAPEP-13-RdV28	Vegetation	Bq/sample	Manganese-54	-0.002	0.00	False Pos Test	Acceptable
05/13/13	MAPEP-13-RdV28	Vegetation	Bq/sample	Plutonium-238	0.110	0.110	0.077-0.143	Acceptable
05/13/13	MAPEP-13-RdV28	Vegetation	Bq/sample	Pu-239/240	0.113	0.123	0.086-0.160	Acceptable
05/13/13	MAPEP-13-RdV28	Vegetation	Bq/sample	Strontium-90	1.358	1.64	1.15-2.13	Acceptable
05/13/13	MAPEP-13-RdV28	Vegetation	Bq/sample	U-234/233	0.0081	0.0038	Sens. Eval.	Not Accept.
05/13/13	MAPEP-13-RdV28	Vegetation	Bq/sample	Uranium-238	0.00489	0.002	Sens. Eval.	Not Accept.
05/13/13	MAPEP-13-RdV28	Vegetation	Bq/sample	Zinc-65	6.59	6.25	4.38-8.13	Acceptable
11/12/13	MAPEP-13-GrF29	Filter	Bq/sample	Gross Alpha	1.090	0.900	0.3-1.5	Acceptable
11/12/13	MAPEP-13-GrF29	Filter	Bq/sample	Gross Beta	1.730	1.630	0.82-2.45	Acceptable
11/12/13	MAPEP-13-MaS29	Soil	mg/kg	Americium-241	0.00	0	False Pos Test	Acceptable
11/12/13	MAPEP-13-MaS29	Soil	mg/kg	Cesium-134	1090	1172	820-1524	Acceptable
11/12/13	MAPEP-13-MaS29	Soil	mg/kg	Cesium-137	1010	977	684-1270	Acceptable
11/12/13	MAPEP-13-MaS29	Soil	mg/kg	Cobalt-57	0.0	0	False Pos Test	Acceptable
11/12/13	MAPEP-13-MaS29	Soil	mg/kg	Cobalt-60	462.00	451.00	316-586	Acceptable
11/12/13	MAPEP-13-MaS29	Soil	mg/kg	Iron-55	887	820	574-1066	Acceptable
11/12/13	MAPEP-13-MaS29	Soil	mg/kg	Manganese-54	692	674	472-876	Acceptable
11/12/13	MAPEP-13-MaS29	Soil	mg/kg	Nickel-63	525.0	571	400-742	Acceptable
11/12/13	MAPEP-13-MaS29	Soil	mg/kg	Plutonium-238	60.8	62	43.1-80.0	Acceptable
11/12/13	MAPEP-13-MaS29	Soil	mg/kg	Plutonium-239/240	1.33	0.4	Sens. Eval.	Acceptable
11/12/13	MAPEP-13-MaS29	Soil	mg/kg	Potassium-40	638	633	443-823	Acceptable
11/12/13	MAPEP-13-MaS29	Soil	mg/kg	Strontium-90	458.0	460	322-598	Acceptable

Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
11/12/13	MAPEP-13-MaS29	Soil	mg/kg	Technetium-99	0.0	0	False Pos Test	Acceptable
11/12/13	MAPEP-13-MaS29	Soil	mg/kg	U-234/233	26.1	30	21.0-39.0	Acceptable
11/12/13	MAPEP-13-MaS29	Soil	mg/kg	Uranium-238	30.0	34	23.8-44.2	Acceptable
11/12/13	MAPEP-13-MaS29	Soil	mg/kg	Zinc-65	0.0	0	False Pos Test	Acceptable
11/12/13	MAPEP-13-MaW29	Water	Bq/L	Americium-241	0.0001	0.000	False Pos Test	Acceptable
11/12/13	MAPEP-13-MaW29	Water	Bq/L	Cesium-134	27.20	30.0	21.0-39.0	Acceptable
11/12/13	MAPEP-13-MaW29	Water	Bq/L	Cesium-137	31.8	31.6	22.1-41.1	Acceptable
11/12/13	MAPEP-13-MaW29	Water	Bq/L	Cobalt-57	0	0.0	False Pos Test	Acceptable
11/12/13	MAPEP-13-MaW29	Water	Bq/L	Cobalt-60	23.60	23.6	16.51-30.65	Acceptable
11/12/13	MAPEP-13-MaW29	Water	Bq/L	Hydrogen-3	-3.5	0	False Pos Test	Acceptable
11/12/13	MAPEP-13-MaW29	Water	Bq/L	Iron-55	53.00	53.3	37.3-69.3	Acceptable
11/12/13	MAPEP-13-MaW29	Water	Bq/L	Manganese-54	-0.009	0.0	False Pos Test	Acceptable
11/12/13	MAPEP-13-MaW29	Water	Bq/L	Nickel-63	27.7	26.4	18.5-34.3	Acceptable
11/12/13	MAPEP-13-MaW29	Water	Bq/L	Plutonium-238	1.070	1.216	0.851-1.581	Acceptable
11/12/13	MAPEP-13-MaW29	Water	Bq/L	Plutonium-239/240	0.907	0.996	0.697-1.295	Acceptable
11/12/13	MAPEP-13-MaW29	Water	Bq/L	Potassium-40	0.339	0	False Pos Test	Acceptable
11/12/13	MAPEP-13-MaW29	Water	Bq/L	Strontium-90	6.65	7.22	5.05-9.39	Acceptable
11/12/13	MAPEP-13-MaW29	Water	Bq/L	Technetium-99	15.4	16.20	11.3-21.1	Acceptable
11/12/13	MAPEP-13-MaW29	Water	Bq/L	Uranium-234/233	0.065	0.07	Sens. Eval.	Acceptable
11/12/13	MAPEP-13-MaW29	Water	Bq/L	Uranium-238	0.031	0.034	Sens. Eval.	Acceptable
11/12/13	MAPEP-13-MaW29	Water	Bq/L	Zinc-65	36.500	34.60	24.2-45.0	Acceptable
11/12/13	MAPEP-13-MaW29	Water	Bq/L	Gross Alpha	0.793	0.701	0.201-1.192	Acceptable
11/12/13	MAPEP-13-MaW29	Water	Bq/L	Gross Beta	6.220	5.94	2.97-8.91	Acceptable
11/12/13	MAPEP-13-RdF29	Filter	ug/sample	Uranium-235	0.034	0.032	0.0227-0.0421	Acceptable
11/12/13	MAPEP-13-RdF29	Filter	ug/sample	Uranium-238	15.8	16.5	11.6-21.5	Acceptable
11/12/13	MAPEP-13-RdF29	Filter	ug/sample	Uranium-Total	15.80	16.5	11.6-21.5	Acceptable
11/12/13	MAPEP-13-RdF29	Filter	ug/sample	Americium-241	0.0002	0.000	False Pos Test	Acceptable
11/12/13	MAPEP-13-RdF29	Filter	Bq/sample	Cesium-134	-0.0016	0.00	False Pos Test	Acceptable
11/12/13	MAPEP-13-RdF29	Filter	Bq/sample	Cesium-137	3.010	2.70	1.9-3.5	Acceptable
11/12/13	MAPEP-13-RdF29	Filter	Bq/sample	Cobalt-57	3.530	3.40	2.4-4.4	Acceptable
11/12/13	MAPEP-13-RdF29	Filter	Bq/sample	Cobalt-60	2.440	2.30	1.6-3.0	Acceptable
11/12/13	MAPEP-13-RdF29	Filter	Bq/sample	Manganese-54	3.720	3.50	2.5-4.6	Acceptable
11/12/13	MAPEP-13-RdF29	Filter	Bq/sample	Plutonium-238	0.128	0.124	0.087-0.161	Acceptable
11/12/13	MAPEP-13-RdF29	Filter	Bq/sample	Plutonium-239/240	0.092	0.0920	0.064-0.12	Acceptable
11/12/13	MAPEP-13-RdF29	Filter	Bq/sample	Strontium-90	1.690	1.81	1.27-2.35	Acceptable
11/12/13	MAPEP-13-RdF29	Filter	Bq/sample	Uranium-234/233	0.027	0.0292	0.0204-0.038	Acceptable
11/12/13	MAPEP-13-RdF29	Filter	Bq/sample	Uranium-238	0.020	0.021	0.144-0.267	Acceptable
11/12/13	MAPEP-13-RdF29	Filter	Bq/sample	Zinc-65	3.050	2.70	1.9-3.5	Acceptable
11/12/13	MAPEP-13-RdV29	Vegetation	Bq/sample	Americium-241	0.226	0.19	0.135-0.251	Acceptable
11/12/13	MAPEP-13-RdV29	Vegetation	Bq/sample	Cesium-134	4.750	5.20	3.64-6.67	Acceptable
11/12/13	MAPEP-13-RdV29	Vegetation	Bq/sample	Cesium-137	6.910	6.60	4.62-8.58	Acceptable
11/12/13	MAPEP-13-RdV29	Vegetation	Bq/sample	Cobalt-57	-0.002	0.00	False Pos Test	Acceptable

Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
11/12/13	MAPEP-13-RdV29	Vegetation	Bq/sample	Cobalt-60	0.008	0.00	False Pos Test	Acceptable
11/12/13	MAPEP-13-RdV29	Vegetation	Bq/sample	Manganese-54	7.980	7.88	5.52-10.24	Acceptable
11/12/13	MAPEP-13-RdV29	Vegetation	Bq/sample	Plutonium-238	0.001	0.001	Sens. Eval.	Acceptable
11/12/13	MAPEP-13-RdV29	Vegetation	Bq/sample	Plutonium-239/240	0.1510	0.171	0.120-0.222	Acceptable
11/12/13	MAPEP-13-RdV29	Vegetation	Bq/sample	Strontium-90	2.330	2.32	1.62-3.02	Acceptable
11/12/13	MAPEP-13-RdV29	Vegetation	Bq/sample	Uranium-234/233	0.046	0.047	0.0326-0.0606	Acceptable
11/12/13	MAPEP-13-RdV29	Vegetation	Bq/sample	Uranium-238	0.332	0.324	0.227-0.421	Acceptable
11/12/13	MAPEP-13-RdV29	Vegetation	Bq/sample	Zinc-65	2.850	2.63	1.84-3.42	Acceptable
11/12/13	MAPEP-13-XaW29	Water	Bq/L	Iodine-129	3.62	3.79	2.65-4.93	Acceptable

TABLE 4

2013 ERA PROGRAM PERFORMANCE EVALUATION RESULTS

Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
02/28/13	RAD - 92	Water	pCi/L	Barium-133	55.4	54.4	44.9-60.2	Acceptable
02/28/13	RAD - 92	Water	pCi/L	Cesium-134	27.2	29.9	23.4-32.9	Acceptable
02/28/13	RAD - 92	Water	pCi/L	Cesium-137	74.3	75.3	67.8-85.5	Acceptable
02/28/13	RAD - 92	Water	pCi/L	Cobalt-60	89.0	97.7	87.9-110	Acceptable
02/28/13	RAD - 92	Water	pCi/L	Zinc-65	126	114	103-136	Acceptable
02/28/13	RAD - 92	Water	pCi/L	Gross Alpha	26.0	24.8	12.5-33.0	Acceptable
02/28/13	RAD - 92	Water	pCi/L	Gross Beta	19.4	19.3	11.3-27.5	Acceptable
02/28/13	RAD - 92	Water	pCi/L	Gross Alpha	31.4	24.8	12.5-33.0	Acceptable
02/28/13	RAD - 92	Water	pCi/L	Radium-226	10.4	9.91	7.42-11.6	Acceptable
02/28/13	RAD - 92	Water	pCi/L	Radium-228	4.84	5.22	3.14-6.96	Acceptable
02/28/13	RAD - 92	Water	pCi/L	Uranium (Nat)	6.43	5.96	4.47-7.13	Acceptable
02/28/13	RAD - 92	Water	ug/L	Uranium (Nat) mass	9.59	8.69	6.50-10.4	Acceptable
02/28/13	RAD - 92	Water	pCi/L	Radium-226	11.60	9.91	7.42-11.6	Acceptable
02/28/13	RAD - 92	Water	pCi/L	Radium-228	5.13	5.22	3.14-6.96	Acceptable
02/28/13	RAD - 92	Water	pCi/L	Uranium (Nat)	5.95	5.96	4.47-7.13	Acceptable
02/28/13	RAD - 92	Water	ug/L	Uranium (Nat) mass	9.95	8.69	6.50-10.4	Acceptable
02/28/13	RAD - 92	Water	pCi/L	Tritium	1430	1320	1040-1480	Acceptable
02/28/13	RAD - 92	Water	pCi/L	Strontium-89	47.5	48	37.6-55.3	Acceptable
02/28/13	RAD - 92	Water	pCi/L	Strontium-90	35.9	39.8	29.2-45.8	Acceptable
02/28/13	RAD - 92	Water	pCi/L	Strontium-89	42.9	48	37.6-55.3	Acceptable
02/28/13	RAD - 92	Water	pCi/L	Strontium-90	34.6	39.8	29.2-45.8	Acceptable
02/28/13	RAD - 92	Water	pCi/L	Iodine-131	23.6	22.7	18.8-27.0	Acceptable
02/28/13	RAD - 92	Water	pCi/L	Iodine-131	27	22.7	18.8-27.0	Acceptable
08/22/13	RAD - 94	Water	pCi/L	Barium-133	76.4	740.5	62.4-82.0	Acceptable
08/22/13	RAD - 94	Water	pCi/L	Cesium-134	68.7	72.4	59.1-79.6	Acceptable
08/22/13	RAD - 94	Water	pCi/L	Cesium-137	154	155	140-172	Acceptable
08/22/13	RAD - 94	Water	pCi/L	Cobalt-60	85.3	82.3	74.1-92.9	Acceptable
08/22/13	RAD - 94	Water	pCi/L	Zinc-65	297	260	234-304	Acceptable
08/22/13	RAD - 94	Water	pCi/L	Gross Alpha	74.3	57.1	29.8-71.2	Not Acceptable
08/22/13	RAD - 94	Water	pCi/L	Gross Beta	34.3	41.8	27.9-49.2	Acceptable
08/22/13	RAD - 94	Water	pCi/L	Gross Alpha	67.7	57.1	29.8-71.2	Acceptable
08/22/13	RAD - 94	Water	pCi/L	Radium-226	16.9	17.2	12.8-19.7	Acceptable
08/22/13	RAD - 94	Water	pCi/L	Radium-226	17	17.2	12.8-19.7	Acceptable
08/22/13	RAD - 94	Water	pCi/L	Radium-228	3.53	3.86	2.18-5.4	Acceptable
08/22/13	RAD - 94	Water	pCi/L	Uranium (Nat)	20.4	21.4	17.1-24.1	Acceptable
08/22/13	RAD - 94	Water	ug/L	Uranium (Nat) mass	30.4	31.2	25.0-35.2	Acceptable
08/22/13	RAD - 94	Water	pCi/L	Radium-226	14.6	17.2	12.8-19.7	Acceptable
08/22/13	RAD - 94	Water	pCi/L	Uranium (Nat)	21.6	21.4	17.1-24.1	Acceptable
08/22/13	RAD - 94	Water	ug/L	Uranium (Nat) mass	33.7	31.2	25-35.2	Acceptable
08/22/13	RAD - 94	Water	pCi/L	Tritium	12500	13300	11600-14600	Acceptable
08/22/13	RAD - 94	Water	pCi/L	Strontium-89	48.9	36.5	27.4-43.4	Not Acceptable
08/22/13	RAD - 94	Water	pCi/L	Strontium-90	14.3	19.8	14.1-23.4	Acceptable
08/22/13	RAD - 94	Water	pCi/L	Strontium-89	44.3	36.5	27.4-43.4	Not Acceptable
08/22/13	RAD - 94	Water	pCi/L	Strontium-90	17.3	19.8	14.1-23.4	Acceptable
08/22/13	RAD - 94	Water	pCi/L	Iodine-131	26.1	24.3	20.2-28.8	Acceptable
08/22/13	RAD - 94	Water	pCi/L	Iodine-131	23.3	24.3	20.2-28.8	Acceptable

TABLE 5

2013 ERA PROGRAM (MRAD) PERFORMANCE EVALUATION RESULTS

Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
05/22/13	MRAD-18	Soil	pCi/kg	Actinium-228	1500	1240	795-1720	Acceptable
05/22/13	MRAD-18	Soil	pCi/kg	Americium-241	225	229	134-297	Acceptable
05/22/13	MRAD-18	Soil	pCi/kg	Bismuth-212	1250	1240	330-1820	Acceptable
05/22/13	MRAD-18	Soil	pCi/kg	Bismuth-214	4410	3660	2200-5270	Acceptable
05/22/13	MRAD-18	Soil	pCi/kg	Cesium-134	7850	6370	4160-7650	Not Accept.
05/22/13	MRAD-18	Soil	pCi/kg	Cesium-137	8070	6120	4690-7870	Not Accept.
05/22/13	MRAD-18	Soil	pCi/kg	Cobalt-60	10300	7920	5360-10900	Acceptable
05/22/13	MRAD-18	Soil	pCi/kg	Lead-212	1290	1240	812-1730	Acceptable
05/22/13	MRAD-18	Soil	pCi/kg	Lead-214	4690	3660	2140-5460	Acceptable
05/22/13	MRAD-18	Soil	pCi/kg	Manganese-54	<63.4	<1000	0-1000	Acceptable
05/22/13	MRAD-18	Soil	pCi/kg	Plutonium-238	651	788.00	474-1090	Acceptable
05/22/13	MRAD-18	Soil	pCi/kg	Plutonium-239	320	366.00	239-506	Acceptable
05/22/13	MRAD-18	Soil	pCi/kg	Potassium-40	10300	10300	7520-13800	Acceptable
05/22/13	MRAD-18	Soil	pCi/kg	Strontium-90	6730	8530	3250-13500	Acceptable
05/22/13	MRAD-18	Soil	pCi/kg	Thorium-234	3290	1900	601-3570	Acceptable
05/22/13	MRAD-18	Soil	pCi/kg	Zinc-65	1910	1400	1110-1860	Not Accept.
05/22/13	MRAD-18	Soil	pCi/kg	Strontium-90	6730	8530	3250-13500	Acceptable
05/22/13	MRAD-18	Soil	pCi/kg	Uranium-234	1210	1920	1170-2460	Acceptable
05/22/13	MRAD-18	Soil	pCi/kg	Uranium-238	1630	1900	1180-2410	Acceptable
05/22/13	MRAD-18	Soil	pCi/kg	Uranium-Total	2840	3920	2130-5170	Acceptable
05/22/13	MRAD-18	Soil	ug/kg	Uranium-Total(mass)	4150	5710	3150-7180	Acceptable
05/22/13	MRAD-18	Vegetation	pCi/kg	Am-241	629	553	338-735	Acceptable
05/22/13	MRAD-18	Vegetation	pCi/kg	Cesium-134	1400	1240	797-1610	Acceptable
05/22/13	MRAD-18	Vegetation	pCi/kg	Cesium-137	687	544	394-757	Acceptable
05/22/13	MRAD-18	Vegetation	pCi/kg	Cobalt-60	2410	1920	1320-2680	Acceptable
05/22/13	MRAD-18	Vegetation	pCi/kg	Curium-244	1420	1340	657-2090	Acceptable
05/22/13	MRAD-18	Vegetation	pCi/kg	Manganese-54	<47.4	<300	0.00-300	Acceptable
05/22/13	MRAD-18	Vegetation	pCi/kg	Plutonium-238	2060	1980	1180-2710	Acceptable
05/22/13	MRAD-18	Vegetation	pCi/kg	Plutonium-239	2230	2260	1390-3110	Acceptable
05/22/13	MRAD-18	Vegetation	pCi/kg	Potassium-40	35600	31900	23000-44800	Acceptable
05/22/13	MRAD-18	Vegetation	pCi/kg	Strontium-90	3720	3840	2190-5090	Acceptable
05/22/13	MRAD-18	Vegetation	pCi/kg	Uranium-234	2650	2460	1620-3160	Acceptable
05/22/13	MRAD-18	Vegetation	pCi/kg	Uranium-238	2580	2440	1630-3100	Acceptable
05/22/13	MRAD-18	Vegetation	pCi/kg	Uranium-Total	5361	5010	3390-6230	Acceptable
05/22/13	MRAD-18	Vegetation	ug/kg	Uranium-Total(mass)	7740	7310	4900-9280	Acceptable
05/22/13	MRAD-18	Vegetation	pCi/kg	Zinc-65	1150	878	633-1230	Acceptable
05/22/13	MRAD-18	Filter	pCi/Filter	Americium-241	62.9	66.8	41.2-90.4	Acceptable
05/22/13	MRAD-18	Filter	pCi/Filter	Cesium-134	1080	1110	706-1380	Acceptable
05/22/13	MRAD-18	Filter	pCi/Filter	Cesium-137	971	940	706-1230	Acceptable
05/22/13	MRAD-18	Filter	pCi/Filter	Cobalt-60	217	214	166-267	Acceptable
05/22/13	MRAD-18	Filter	pCi/Filter	Iron-55	224	225	69.8-440	Acceptable
05/22/13	MRAD-18	Filter	pCi/Filter	Manganese-54	<5.27	<50.0	0-50.0	Acceptable
05/22/13	MRAD-18	Filter	pCi/Filter	Plutonium-238	48.0	50.1	34.3-65.9	Acceptable
05/22/13	MRAD-18	Filter	pCi/Filter	Plutonium-239	62.7	65.2	47.2-85.2	Acceptable
05/22/13	MRAD-18	Filter	pCi/Filter	Strontium-90	139	138	67.4-207	Acceptable
05/22/13	MRAD-18	Filter	pCi/Filter	Uranium-234	54.5	59.4	36.8-89.6	Acceptable

Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
05/22/13	MRAD-18	Filter	pCi/Filter	Uranium-238	58.5	58.9	38.1-81.4	Acceptable
05/22/13	MRAD-18	Filter	pCi/Filter	Uranium-Total	117	121	67.0-184	Acceptable
05/22/13	MRAD-18	Filter	ug/Filter	Uranium-Total(mass)	176	176	113-248	Acceptable
05/22/13	MRAD-18	Filter	pCi/Filter	Zinc-65	222	199	142-275	Acceptable
05/22/13	MRAD-18	Filter	pCi/Filter	Gross Alpha	55.5	42.3	14.2-65.7	Acceptable
05/22/13	MRAD-18	Filter	pCi/Filter	Gross Beta	31	25.1	15.9-36.6	Acceptable
05/22/13	MRAD-18	Water	pCi/L	Americium-241	118	118	79.5-158	Acceptable
05/22/13	MRAD-18	Water	pCi/L	Cesium-134	1320	1400	1030-1610	Acceptable
05/22/13	MRAD-18	Water	pCi/L	Cesium-137	1900	1880	1600-2250	Acceptable
05/22/13	MRAD-18	Water	pCi/L	Cobalt-60	2370	2270	1970-2660	Acceptable
05/22/13	MRAD-18	Water	pCi/L	Iron-55	812	712	424-966	Acceptable
05/22/13	MRAD-18	Water	pCi/L	Manganese-54	<7.6	<100	0.00-100	Acceptable
05/22/13	MRAD-18	Water	pCi/L	Plutonium-238	91	99	73.1-123	Acceptable
05/22/13	MRAD-18	Water	pCi/L	Plutonium-239	161	185	144-233	Acceptable
05/22/13	MRAD-18	Water	pCi/L	Strontium-90	144	137	89.2-181	Acceptable
05/22/13	MRAD-18	Water	pCi/L	Uranium-234	47.3	48.8	36.7-62.9	Acceptable
05/22/13	MRAD-18	Water	pCi/L	Uranium-238	50.8	48.4	36.9-59.4	Acceptable
05/22/13	MRAD-18	Water	pCi/L	Uranium-Total	98.1	99.5	73.1-129	Acceptable
05/22/13	MRAD-18	Water	ug/L	Uranium-Total(mass)	152	145	116-175	Acceptable
05/22/13	MRAD-18	Water	pCi/L	Zinc-65	428	384	320-484	Acceptable
05/22/13	MRAD-18	Water	pCi/L	Gross Alpha	138.0	130	46.2-201	Acceptable
05/22/13	MRAD-18	Water	pCi/L	Gross Beta	87	78.9	45.2-117	Acceptable
05/22/13	MRAD-18	Water	pCi/L	Tritium	13100	12300	8240-17500	Acceptable
11/26/13	MRAD-19	Soil	pCi/kg	Actinium-228	1200	1240	795-1720	Acceptable
11/26/13	MRAD-19	Soil	pCi/kg	Americium-241	186	164	95.9-213	Acceptable
11/26/13	MRAD-19	Soil	pCi/kg	Bismuth-212	1760	1220	325-1790	Acceptable
11/26/13	MRAD-19	Soil	pCi/kg	Bismuth-214	4350	3740	2250-5380	Acceptable
11/26/13	MRAD-19	Soil	pCi/kg	Cesium-134	2690	2820	1840-3390	Acceptable
11/26/13	MRAD-19	Soil	pCi/kg	Cesium-137	3960	4130	3160-5310	Acceptable
11/26/13	MRAD-19	Soil	pCi/kg	Cobalt-60	5490	5680	3840-7820	Acceptable
11/26/13	MRAD-19	Soil	pCi/kg	Lead-212	1260	1220	799-1700	Acceptable
11/26/13	MRAD-19	Soil	pCi/kg	Lead-214	4700	3740	2180-5580	Acceptable
11/26/13	MRAD-19	Soil	pCi/kg	Manganese-54	<55.2	<1000	0-1000	Acceptable
11/26/13	MRAD-19	Soil	pCi/kg	Plutonium-238	576	658	396-908	Acceptable
11/26/13	MRAD-19	Soil	pCi/kg	Plutonium-239	400	397	260-548	Acceptable
11/26/13	MRAD-19	Soil	pCi/kg	Potassium-40	11200	12400	9080-16700	Acceptable
11/26/13	MRAD-19	Soil	pCi/kg	Strontium-90	8220	6860	2620-10800	Acceptable
11/26/13	MRAD-19	Soil	pCi/kg	Thorium-234	2870	3080	974-5790	Acceptable
11/26/13	MRAD-19	Soil	pCi/kg	Zinc-65	3400	3160	2520-4200	Acceptable
11/26/13	MRAD-19	Soil	pCi/kg	Uranium-234	2870	3080	974-5790	Acceptable
11/26/13	MRAD-19	Soil	pCi/kg	Uranium-238	2979	3080	1910-3910	Acceptable
11/26/13	MRAD-19	Soil	pCi/kg	Uranium-Total	6870	6320	3430-8340	Acceptable
11/26/13	MRAD-19	Soil	ug/kg	Uranium-Total(mass)	8460	9220	5080-11600	Acceptable
11/26/13	MRAD-19	Vegetation	pCi/kg	Am-241	3800	3630	2220-4830	Acceptable
11/26/13	MRAD-19	Vegetation	pCi/kg	Cesium-134	907	859	552-1120	Acceptable
11/26/13	MRAD-19	Vegetation	pCi/kg	Cesium-137	1220	1030	747-1430	Acceptable
11/26/13	MRAD-19	Vegetation	pCi/kg	Cobalt-60	2100	1880	1300-2630	Acceptable
11/26/13	MRAD-19	Vegetation	pCi/kg	Curium-244	1230	1250	612-1950	Acceptable
11/26/13	MRAD-19	Vegetation	pCi/kg	Manganese-54	<53.3	<300	0-300	Acceptable

Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
11/26/13	MRAD-19	Vegetation	pCi/kg	Plutonium-238	1280	1290	769-1770	Acceptable
11/26/13	MRAD-19	Vegetation	pCi/kg	Plutonium-239	2580	2770	1700-3810	Acceptable
11/26/13	MRAD-19	Vegetation	pCi/kg	Potassium-40	33600	33900	24500-47600	Acceptable
11/26/13	MRAD-19	Vegetation	pCi/kg	Strontium-90	5870	6360	3630-8430	Acceptable
11/26/13	MRAD-19	Vegetation	pCi/kg	Uranium-234	674	654	430-840	Acceptable
11/26/13	MRAD-19	Vegetation	pCi/kg	Uranium-234	1050	654	430-840	Not Acceptable
11/26/13	MRAD-19	Vegetation	pCi/kg	Uranium-238	655	648	432-823	Acceptable
11/26/13	MRAD-19	Vegetation	pCi/kg	Uranium-Total	1364	1330	901-1660	Acceptable
11/26/13	MRAD-19	Vegetation	pCi/kg	Uranium-Total	1773	1330	901-1660	Not Acceptable
11/26/13	MRAD-19	Vegetation	ug/kg	Uranium-Total(mass)	1960	1940	1300-2460	Acceptable
11/26/13	MRAD-19	Vegetation	pCi/kg	Zinc-65	1990	1540	1110-2160	Acceptable
11/26/13	MRAD-19	Filter	pCi/Filter	Americium-241	75.2	66.4	40.9-89.9	Acceptable
11/26/13	MRAD-19	Filter	pCi/Filter	Cesium-134	845	868.0	552-1080	Acceptable
11/26/13	MRAD-19	Filter	pCi/Filter	Cesium-137	641	602	452-791	Acceptable
11/26/13	MRAD-19	Filter	pCi/Filter	Cobalt-60	534	494	382-617	Acceptable
11/26/13	MRAD-19	Filter	pCi/Filter	Iron-55	466	389.0	121-760	Acceptable
11/26/13	MRAD-19	Filter	pCi/Filter	Manganese-54	<3.9	<50	0.00-50.0	Acceptable
11/26/13	MRAD-19	Filter	ug/Filter	Plutonium-238	72.8	68.5	46.9-90.1	Acceptable
11/26/13	MRAD-19	Filter	pCi/Filter	Plutonium-239	56.5	53.4	42.4-93.1	Acceptable
11/26/13	MRAD-19	Filter	pCi/Filter	Strontium-90	130	125	61.1-187	Acceptable
11/26/13	MRAD-19	Filter	pCi/Filter	Uranium-234	56	87	35.6-86.6	Acceptable
11/26/13	MRAD-19	Filter	pCi/Filter	Uranium-238	58	56.90	36.8-78.7	Acceptable
11/26/13	MRAD-19	Filter	pCi/Filter	Uranium-Total	116	117	64.8-178	Acceptable
11/26/13	MRAD-19	Filter	ug/Filter	Uranium-Total(mass)	172	171	109-241	Acceptable
11/26/13	MRAD-19	Filter	pCi/Filter	Zinc-65	514	419	300-578	Acceptable
11/26/13	MRAD-19	Filter	ug/Filter	Uranium-Total(mass)	169	171	109-241	Acceptable
11/26/13	MRAD-19	Filter	ug/Filter	Uranium-Total(mass)	150	171	109-241	Acceptable
11/26/13	MRAD-19	Filter	pCi/Filter	Gross Alpha	100	83	27.8-129	Acceptable
11/26/13	MRAD-19	Filter	pCi/Filter	Gross Beta	65.7	56.3	35.6-82.2	Acceptable
11/26/13	MRAD-19	Water	pCi/L	Americium-241	126	126	84.9-169	Acceptable
11/26/13	MRAD-19	Water	pCi/L	Cesium-134	2060	2180	1600-2510	Acceptable
11/26/13	MRAD-19	Water	pCi/L	Cesium-137	2730	2760	2340-3310	Acceptable
11/26/13	MRAD-19	Water	pCi/L	Cobalt-60	1960	1890	1640-2210	Acceptable
11/26/13	MRAD-19	Water	pCi/L	Iron-55	721	689	411-935	Acceptable
11/26/13	MRAD-19	Water	pCi/L	Manganese-54	<7.24	<100	0.00-100	Acceptable
11/26/13	MRAD-19	Water	pCi/L	Plutonium-238	133	138	102-172	Acceptable
11/26/13	MRAD-19	Water	pCi/L	Plutonium-239	98.7	109	84.6-137	Acceptable
11/26/13	MRAD-19	Water	pCi/L	Strontium-90	726	788	513-1040	Acceptable
11/26/13	MRAD-19	Water	pCi/L	Uranium-234	93	99	74.3-128	Acceptable
11/26/13	MRAD-19	Water	pCi/L	Uranium-238	93	98.00	74.7-120	Acceptable
11/26/13	MRAD-19	Water	pCi/L	Uranium-Total	186	201	148-260	Acceptable
11/26/13	MRAD-19	Water	ug/L	Uranium-Total(mass)	278	294	234-355	Acceptable
11/26/13	MRAD-19	Water	pCi/L	Zinc-65	1560	1370	1140-1730	Acceptable
11/26/13	MRAD-19	Water	pCi/L	Gross Alpha	105.0	97	34.3-150	Acceptable
11/26/13	MRAD-19	Water	pCi/L	Gross Beta	78.8	84.5	48.4-125	Acceptable
11/26/13	MRAD-19	Water	pCi/L	Tritium	8740	9150	6130-13000	Acceptable
11/26/13	MRAD-19	Water	pCi/L	Uranium-234	92.4	98.9	74.3-128	Acceptable
11/26/13	MRAD-19	Water	pCi/L	Uranium-238	96.1	98.0	74.7-120	Acceptable
11/26/13	MRAD-19	Water	pCi/L	Uranium-Total	193	201	148-260	Acceptable

Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
11/26/13	MRAD-19	Water	ug/L	Uranium-Total(mass)	288	294	234-355	Acceptable
11/26/13	MRAD-19	Water	pCi/L	Uranium-234	95.2	98.9	74.3-128	Acceptable
11/26/13	MRAD-19	Water	pCi/L	Uranium-238	115	98.00	74.7-120	Acceptable
11/26/13	MRAD-19	Water	pCi/L	Uranium-Total	215	201	148-260	Acceptable
11/26/13	MRAD-19	Water	ug/L	Uranium-Total(mass)	344	294	234-355	Acceptable
11/26/13	MRAD-19	Water	ug/L	Uranium-Total(mass)	258	294	234-355	Acceptable

FIGURE 1

COBALT-60 PERFORMANCE EVALUATION RESULTS AND % BIAS

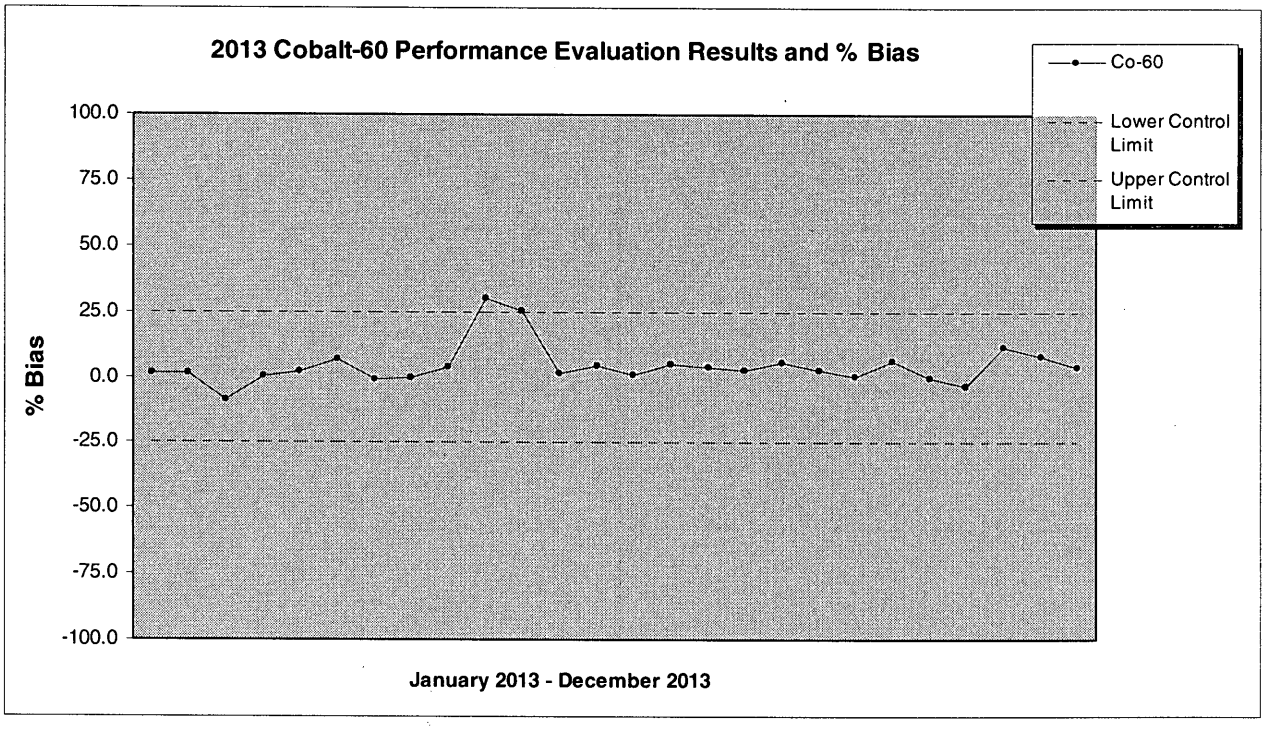


FIGURE 2

CESIUM-137 PERFORMANCE EVALUATION RESULTS AND % BIAS

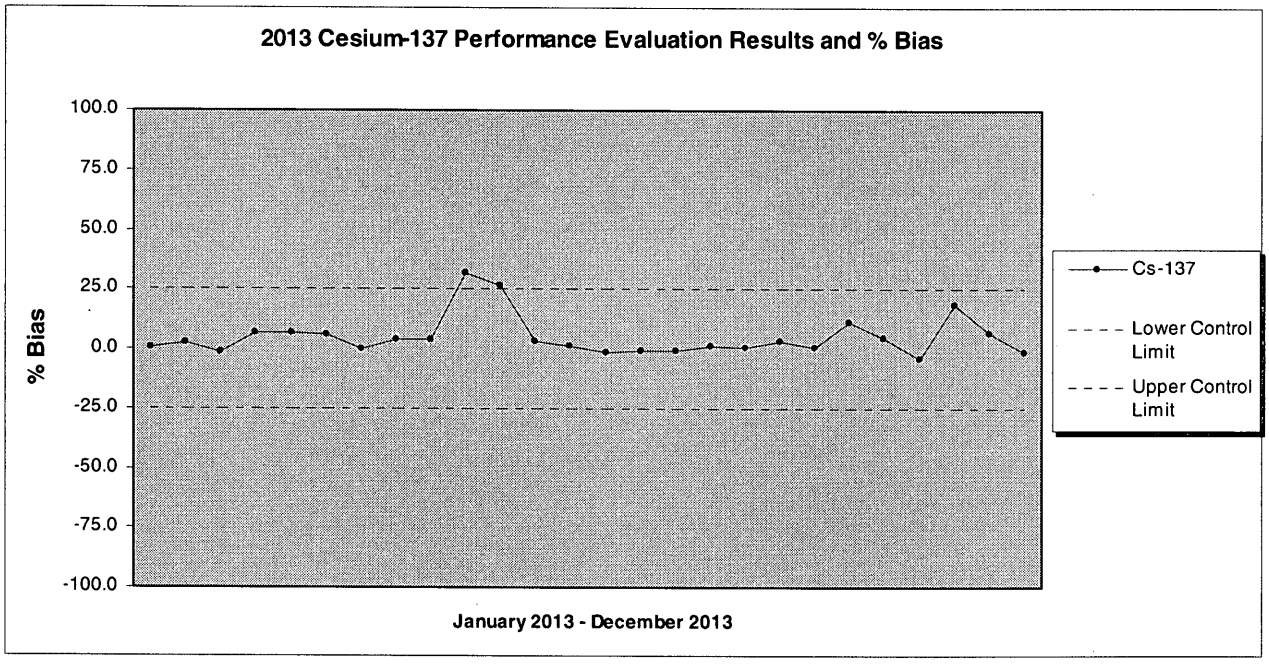


FIGURE 3

TRITIUM PERFORMANCE EVALUATION RESULTS AND % BIAS

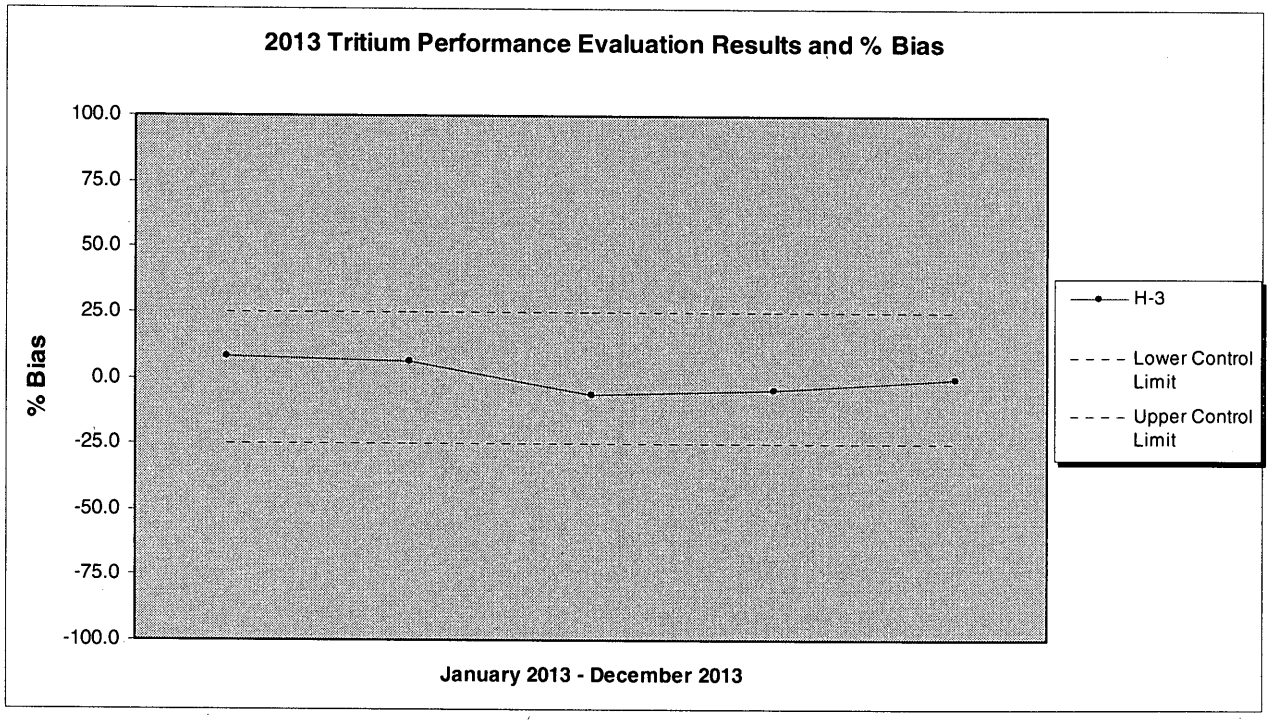


FIGURE 4

STRONTIUM-90 PERFORMANCE EVALUATION RESULTS AND % BIAS

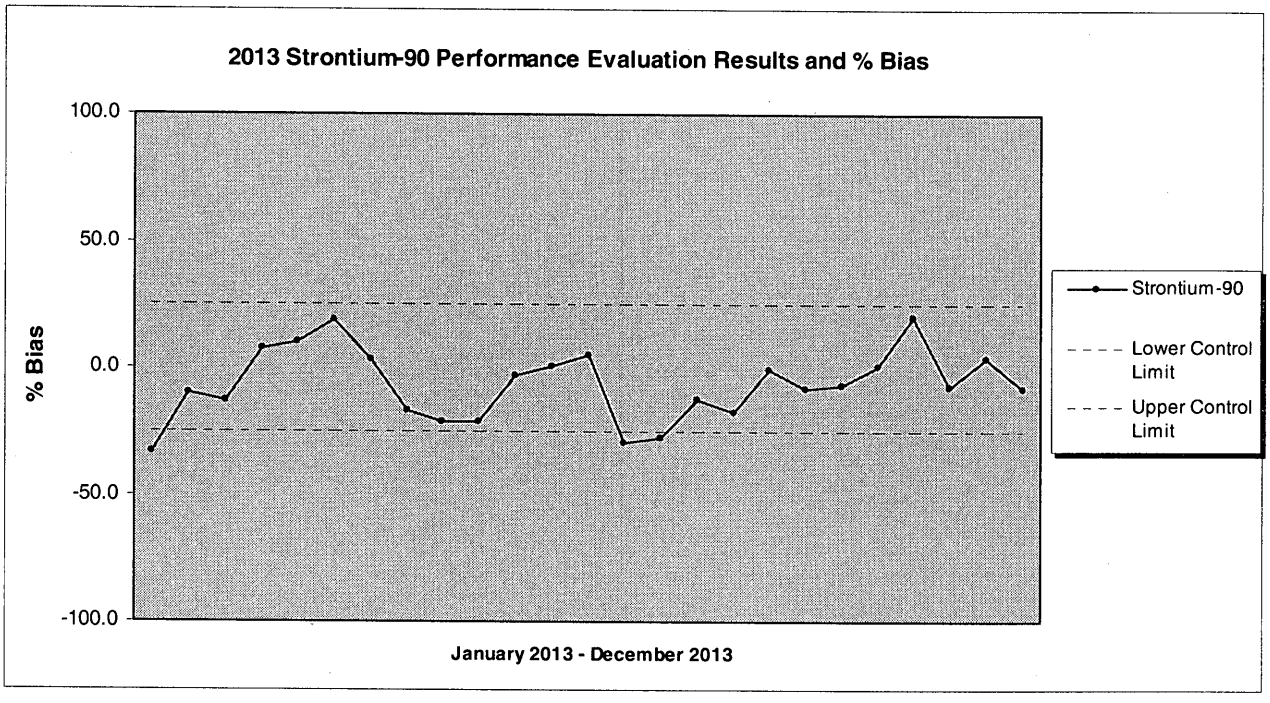


FIGURE 5

GROSS ALPHA PERFORMANCE EVALUATION RESULTS AND % BIAS

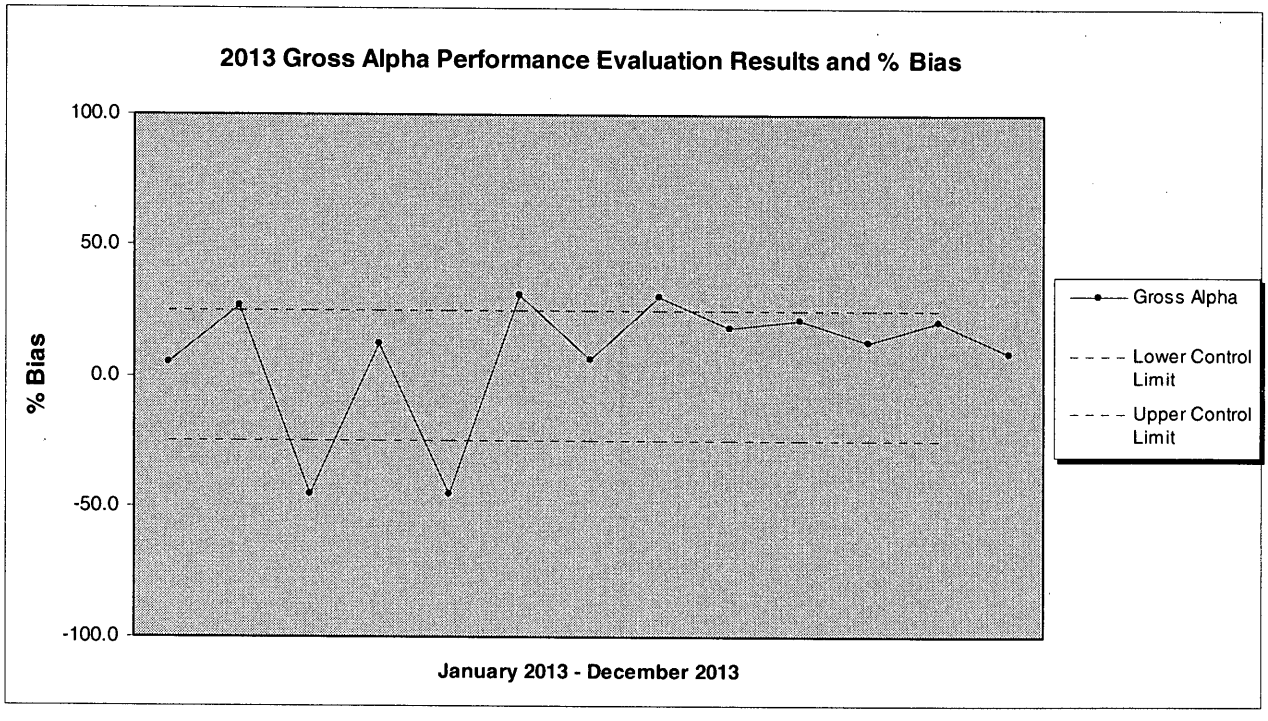


FIGURE 6

GROSS BETA PERFORMANCE EVALUATION RESULTS AND % BIAS

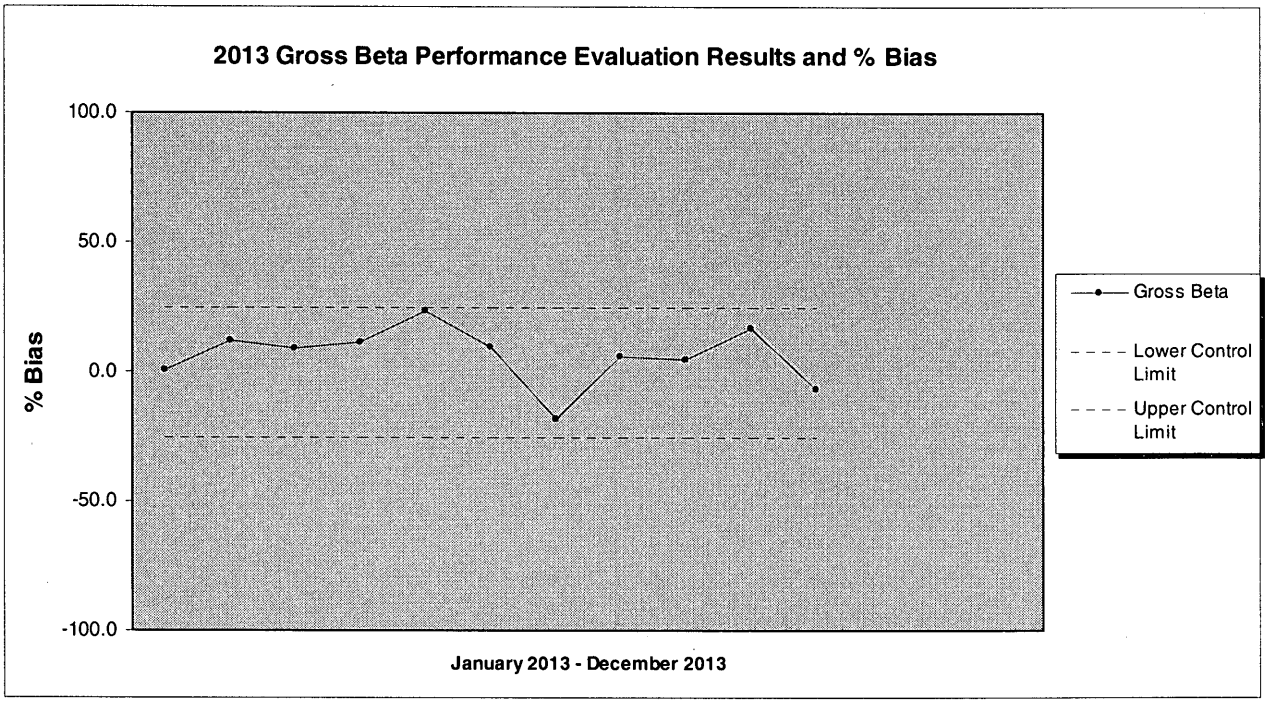


FIGURE 7

IODINE-131 PERFORMANCE EVALUATION RESULTS AND % BIAS

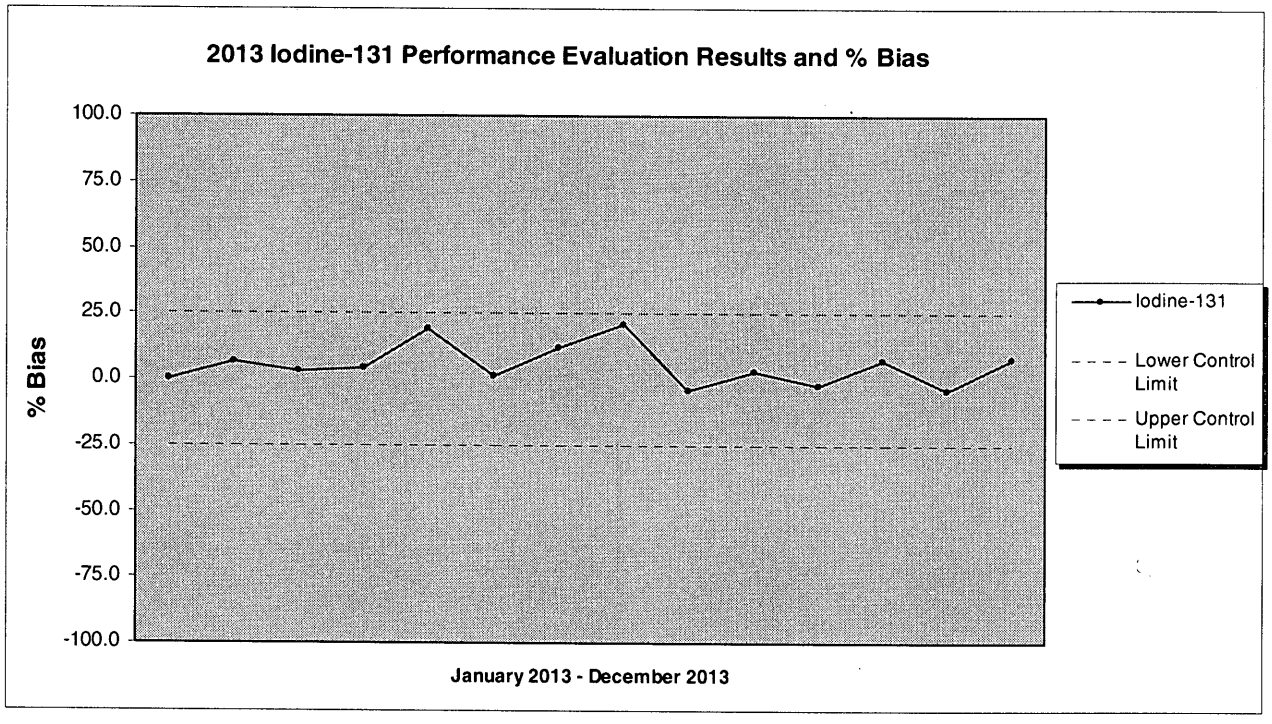


FIGURE 8

AMERICIUM-241 PERFORMANCE EVALUATION RESULTS AND % BIAS

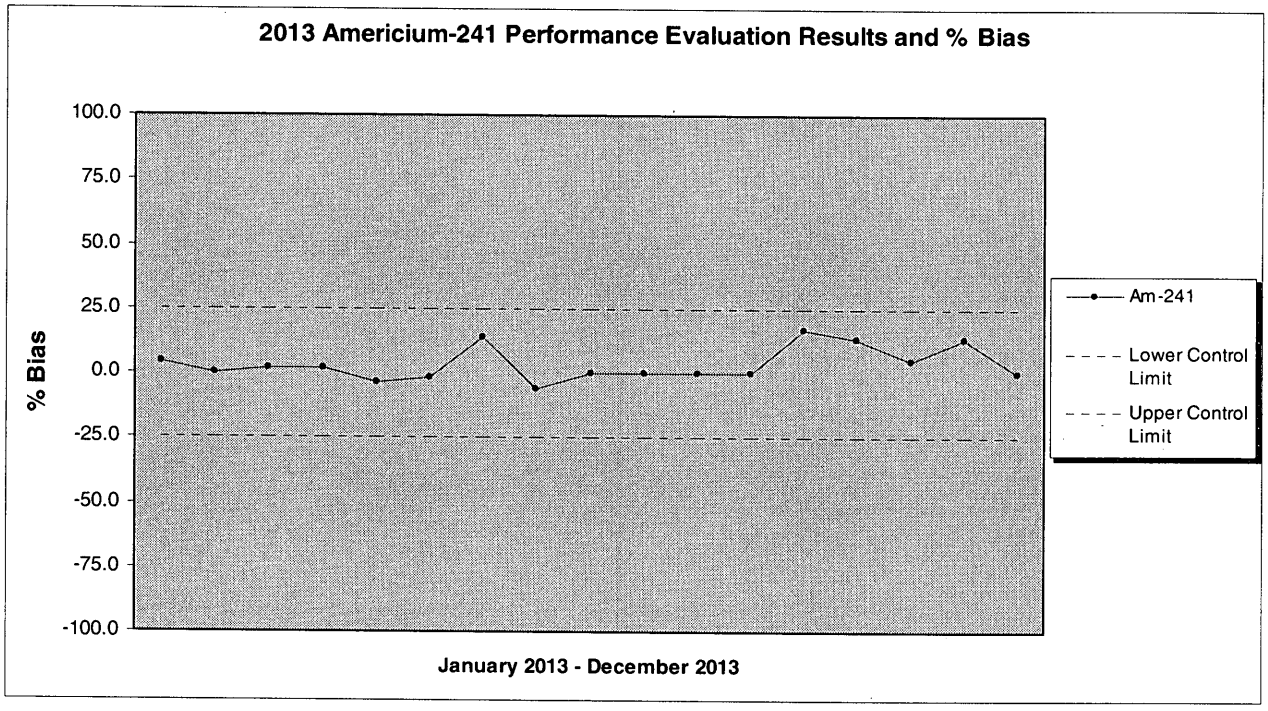


FIGURE 9

PLUTONIUM-238 PERFORMANCE EVALUATION RESULTS AND % BIAS

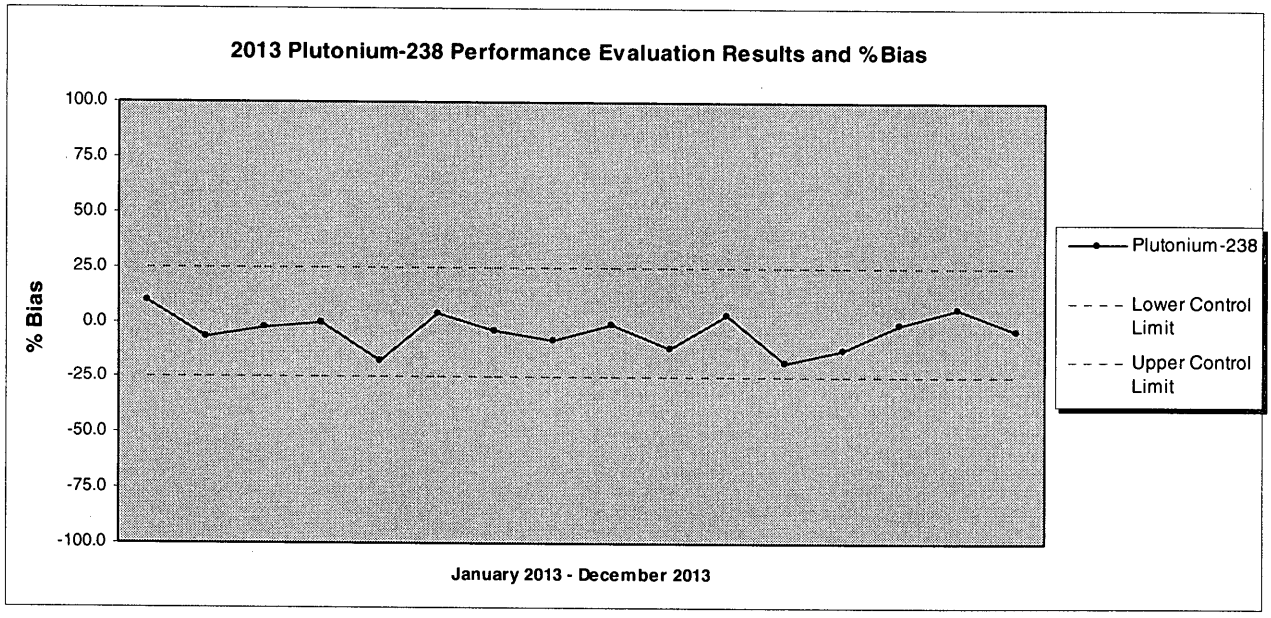


TABLE 6

REMP INTRA-LABORATORY DATA SUMMARY: BIAS AND PRECISION BY MATRIX

REMP 2013	Bias Criteria (+ / - 25%)		Precision Criteria (Note 1)	
	WITHIN CRITERIA	OUTSIDE CRITERIA	WITHIN CRITERIA	OUTSIDE CRITERIA
MILK				
Gamma Iodine-131	41	0	131	0
Gas Flow Sr 2nd count	46	0	49	0
Gas Flow Total Strontium	35	0	35	0
Gamma Spec Liquid RAD A-013 with Ba, La	61	0	120	0
SOLID				
LSC Iron-55	5	0	5	0
Gamma Spec Solid RAD A-013	28	0	31	0
LSC Nickel 63	5	0	5	0
Gas Flow Sr 2nd count	4	0	4	0
Gas Flow Total Strontium	8	0	8	0
Gamma Spec Solid RAD A-013 with Ba, La	7	0	10	0
Gamma Spec Solid RAD A-013 with Iodine	6	0	7	0
FILTER				
Gamma Spec Filter RAD A-013	4	0	4	0
Gas Flow Sr 2nd Count	5	0	5	0
Alpha Spec Am241Curium	3	0	3	0
Gas Flow Total Strontium	3	0	3	0
Gross A & B	526	0	527	0
Gamma Spec Filter	45	0	51	0
LIQUID				
Alpha Spec Uranium	8	0	9	0
Tritium	336	0	337	0
Plutonium	1	0	1	0
LSC Iron-55	40	0	42	0
LSC Nickel 63	41	0	43	0
Gamma Spec Liquid RAD A-013	7	0	7	0
Gamma Iodine-131	33	0	33	0
Alpha Spec Plutonium	10	0	10	0
Gas Flow Sr 2nd count	20	0	20	0
Alpha Spec Am241 Curium	17	0	17	0
Gas Flow Total Strontium	161	0	163	0
Gross Alpha Non Vol Beta	102	0	104	0
Gamma Spec Liquid RAD A-013 with Ba, La	129	0	209	0
Gamma Spec Liquid RAD A-013 with Iodine	56	0	85	0
TISSUE				
Gamma Spec Solid RAD A-013	45	0	48	0
LSC Nickel 63	2	0	2	0
Gas Flow Sr 2nd count	10	0	10	0
Gas Flow Total Strontium	17	0	17	0

REMP 2013	Bias Criteria (+ / - 25%)		Precision Criteria (Note 1)	
	WITHIN CRITERIA	OUTSIDE CRITERIA	WITHIN CRITERIA	OUTSIDE CRITERIA
Gamma Spec Solid RAD A-013 with Ba, La	6	0	5	0
Gamma Spec Solid RAD A-013 with Iodine	17	0	17	0
SEA WATER				
LSC Iron-55	2	0	2	0
LSC Nickel 63	2	0	2	0
Gas Flow Total Strontium	1	0	1	0
Gross Alpha Non Vol Beta	1	0	1	0
Gamma Spec Liquid RAD A-013 with Iodine	1	0	1	0
VEGETATION				
Gas Flow Sr 2nd count	9	0	9	0
Gamma Spec Solid RAD A-013 with Iodine	91	0	93	0
AIR CHARCOAL				
Gamma Iodine 131 RAD A-013	623	0	645	0
Carbon-14 (Ascarite/Soda Lime Filter per Liter)	46	0	47	0
DRINKING WATER				
Tritium	51	0	52	0
LSC Iron-55	24	0	22	0
LSC Nickel 63	23	0	21	0
Gamma Iodine-131	38	0	38	0
Gas Flow Sr 2nd count	16	0	16	0
Gas Flow Total Strontium	31	0	31	0
Gross Alpha Non Vol Beta	103	0	103	0
Gamma Spec Liquid RAD A-013 with Ba, La	44	0	98	0
Total	**2996**		**3359**	

Note 1: The RPD must be 20 percent or less, if both samples are greater than 5 times the MDC. If both results are less than 5 times MDC, then the RPD must be equal to or less than 100%. If one result is above the MDC and the other is below the MDC, then the RPD can be calculated using the MDC for the result of the one below the MDC. The RPD must be 100% or less. In the situation where both results are above the MDC but one result is greater than 5 times the MDC and the other is less than 5 times the MDC, the RPD must be less than or equal to 20%. If both results are below MDC, then the limits on % RPD are not applicable.

TABLE 7
ALL RADIOLOGICAL INTRA-LABORATORY DATA SUMMARY:
BIAS AND PRECISION BY MATRIX

ENVIRONMENTAL 2013	Bias Criteria (+ / - 25%		Precision Criteria (Note 1)	
	WITHIN CRITERIA	OUTSIDE CRITERIA	WITHIN CRITERIA	OUTSIDE CRITERIA
MILK				
Gamma Spec Liquid RAD A-013	8	0	8	0
Gamma Iodine-129	1	0	1	0
Gamma Iodine-131	41	0	131	0
Gas Flow Sr 2nd count	50	0	51	0
Gas Flow Strontium 90	10	0	10	0
Gas Flow Total Strontium	35	0	35	0
Gamma Spec Liquid RAD A-013 with Ba, La	61	0	120	0
Gamma Spec Liquid RAD A-013 with Iodine	5	0	3	0
SOLID				
Gas Flow Radium 228	29	0	29	0
Tritium	266	0	312	0
Carbon-14	136	0	227	0
LSC Iron-55	146	0	165	0
Alpha Spec Polonium Solid	19	0	22	0
Gamma Nickel 59 RAD A-022	138	0	157	0
LSC Chlorine-36 in Solids	8	0	13	0
Gamma Spec Ra226 RAD A-013	35	0	42	0
Gamma Spec Solid RAD A-013	701	0	893	0
LSC Nickel 63	176	0	201	0
LSC Plutonium	223	0	245	0
Technetium-99	309	0	339	0
Gamma Spec Liquid RAD A-013	4	0	4	0
ICP-MS Technetium-99 in Soil	75	0	74	0
LSC Selenium 79	5	0	5	0
Total Activity,	2	0	3	0
Tritium	5	0	5	0
Alpha Spec Am243	33	0	42	0
Gamma Iodine-129	172	0	199	0
Gas Flow Lead 210	18	0	19	0
Total Uranium KPA	10	0	18	0
Alpha Spec Uranium	278	0	380	0
LSC Promethium 147	4	0	4	0
LSC, Rapid Strontium 89 and 90	106	0	120	0
Alpha Spec Thorium	207	0	288	0
Gas Flow Radium 228	2	0	2	0
ICP-MS Uranium-233, 234 in Solid	6	0	5	0
Alpha Spec Plutonium	242	0	263	0
ICP-MS Technetium-99 Prep in Soil	78	0	74	0
LSC Calcium 45	2	0	2	0
Alpha Spec Neptunium	234	0	256	0
Alpha Spec Plutonium	157	0	195	0

ENVIRONMENTAL 2013	Bias Criteria (+ / - 25%		Precision Criteria (Note 1)	
	WITHIN CRITERIA	OUTSIDE CRITERIA	WITHIN CRITERIA	OUTSIDE CRITERIA
Alpha Spec Radium 226	7	0	8	0
Gamma Spec Solid with Ra226, Ra228	5	0	6	0
Gas Flow Sr 2nd count	15	0	18	0
Gas Flow Strontium 90	187	0	207	0
Gas Flow Total Radium	1	0	1	0
Lucas Cell Radium 226	71	0	93	0
Total Activity Screen	10	0	13	0
Alpha Spec Am241 Curium	292	0	336	0
Alpha Spec Total Uranium	5	0	6	0
Gas Flow Total Strontium	40	0	44	0
Gross Alpha Non Vol Beta	3	0	3	0
ICP-MS Uranium-233, 234 Prep in Solid	5	0	5	0
ICP-MS Uranium-235, 236, 238 in Solid	7	0	8	0
Alpha Spec Polonium Solid	6	0	4	0
Gamma Spec Solid RAD A-013 with Ba, La	7	0	10	0
Gamma Spec Solid RAD A-013 with Iodine	6	0	7	0
Gamma Spec Solid RAD A-013 (pCi/Sample)	0	0	2	0
Tritium	3	0	3	0
ICP-MS Uranium-234, 235, 236, 238 in Solid	245	0	234	0
ICP-MS Uranium-235, 236, 238 Prep in Solid	5	0	5	0
Gross Alpha/Beta	297	0	405	0
Gross Alpha/Beta (Americium Calibration) Solid	0	0	1	0
ICP-MS Uranium-234, 235, 236, 238 Prep in Solid	122	0	115	0
Lucas Cell Radium 226 by DOE HASL 300 Ra-04 Solid	2	0	2	0
FILTER				
Alpha Spec Uranium	18	0	24	0
Alpha Spec Polonium	0	0	54	0
Gamma I-131, filter	4	0	4	0
LSC Plutonium Filter	143	0	169	3
Tritium	134	0	201	0
Carbon-14	82	0	140	0
Nickel-63	0	0	4	0
LSC Iron-55	147	0	161	0
Gamma Nickel 59 RAD A-022	140	0	159	0
Gamma Iodine 131 RAD A-013	2	0	2	0
LSC Nickel 63	138	0	162	0
Technetium-99	103	0	137	0
Gamma Spec Filter RAD A-013	195	0	245	0
Alphaspec Np Filter per Liter	30	0	42	0
Alphaspec Pu Filter per Liter	14	0	29	0

ENVIRONMENTAL 2013	Bias Criteria (+ / - 25%		Precision Criteria (Note 1)	
	WITHIN CRITERIA	OUTSIDE CRITERIA	WITHIN CRITERIA	OUTSIDE CRITERIA
Gamma Iodine-125	13	0	0	0
Gamma Iodine-129	114	0	127	0
Gross Alpha/Beta	0	0	1	0
Alpha Spec Am243	13	0	42	0
Gas Flow Lead 210	0	0	4	0
LSC Plutonium Filter per Liter	36	0	43	0
Total Uranium KPA	11	0	18	0
Alpha Spec Uranium	83	0	114	0
LSC, Rapid Strontium 89 and 90	144	0	168	0
Alpha Spec Thorium	45	0	57	0
Gas Flow Radium 228	0	0	2	0
Alpha Spec Plutonium	107	0	123	0
Alpha Spec Neptunium	112	0	129	0
Alpha Spec Plutonium	142	0	183	0
Alpha Spec Polonium,(Filter/Liter)	0	0	10	0
Alpha Spec Radium 226	0	0	1	0
Gas Flow Sr 2nd Count	93	0	101	0
Gas Flow Strontium 90	59	0	78	0
Gas Flow Total Radium	0	0	4	0
Lucas Cell Radium-226	0	0	2	0
Alpha Spec Am241Curium	157	0	198	0
Gas Flow Total Strontium	5	0	5	0
Total Activity in Filter,	0	0	7	0
Alphaspec Am241 Curium Filter per Liter	33	0	42	0
Tritium	106	0	108	0
Gamma Spec Filter RAD A-013 Direct Count	7	0	8	0
Carbon-14	44	0	44	0
Direct Count-Gross Alpha/Beta	72	0	0	0
Gross Alpha/Beta	74	0	81	0
ICP-MS Uranium-234, 235, 236, 238 in Filter	8	0	4	0
Alpha Spec U	31	0	60	0
Gross A & B	639	0	584	0
LSC Iron-55	39	0	51	0
Technetium-99	37	0	55	0
Gas Flow Sr-90	29	0	35	0
LSC Nickel 63	37	0	44	0
Carbon-14 (Ascarite/Soda Lime Filter per Liter)	2	0	2	0
Gas Flow Pb-210	25	0	46	0
Gas Flow Ra-228	24	0	35	0
Gamma Iodine 129	47	0	47	0
ICP-MS Uranium-234, 235, 236, 238 Prep in Filter	6	0	3	0
Gamma Spec Filter	142	0	163	0
Lucas Cell Ra-226	32	0	47	0
Alpha Spec Thorium	27	0	46	0

ENVIRONMENTAL 2013	Bias Criteria (+ / - 25%		Precision Criteria (Note 1)	
	WITHIN CRITERIA	OUTSIDE CRITERIA	WITHIN CRITERIA	OUTSIDE CRITERIA
LIQUID				
Alpha Spec Uranium	418	0	607	0
Alpha Spec Polonium	2	0	3	0
Electrolytic Tritium	19	0	29	0
Tritium	1415	0	1503	0
Tritium by Combustion	1	0	1	0
Carbon-14	181	0	204	0
Plutonium	81	0	89	0
Chlorine-36 in Liquids	2	0	3	0
Iodine-131	6	0	3	0
LSC Iron-55	290	0	347	0
Gamma Nickel 59 RAD A-022	29	0	33	0
Gamma Iodine 131 RAD A-013	3	0	3	0
Gamma Radium 228 RAD A-013	1	0	1	0
LSC Nickel 63	328	0	370	0
LSC Radon 222	5	0	12	0
Technetium-99	303	0	365	0
Gamma Spec Liquid RAD A-013	874	0	875	0
Alpha Spec Total U RAD A-011	0	0	2	0
LSC Selenium 79	1	0	1	0
Total Activity,	6	0	6	0
Alpha Spec Am243	12	0	20	0
Gamma Iodine-129	84	0	117	0
Gamma Iodine-131	33	0	33	0
ICP-MS Technetium-99 in Water	5	0	28	0
Gas Flow Lead 210	83	0	94	0
Total Uranium KPA	96	0	226	2
LSC Promethium 147	3	0	3	0
LSC, Rapid Strontium 89 and 90	15	0	15	0
Alpha Spec Thorium	205	0	278	0
Gas Flow Radium 228	244	0	318	0
Gas Flow Radium 228	36	0	35	0
Gas Flow Radium 228	1	0	1	0
Alpha Spec Plutonium	317	0	436	0
Alpha Spec Neptunium	110	0	127	0
Alpha Spec Plutonium	61	0	86	0
Alpha Spec Radium 226	0	0	1	0
Gas Flow Sr 2nd count	283	0	316	0
Gas Flow Strontium 90	499	0	568	0
Gas Flow Strontium 90	2	0	2	0
Gas Flow Total Radium	92	0	129	0
ICP-MS Technetium-99 Prep in Water	5	0	28	0
ICP-MS Uranium-233, 234 in Liquid	1	0	1	0
Lucas Cell Radium 226	372	0	487	0
Lucas Cell Radium-226	17	0	21	0
Total Activity Screen	3	0	3	0
Chlorine-36 in Liquids	4	0	10	0
Alpha Spec Am241 Curium	307	0	405	0

ENVIRONMENTAL 2013	Bias Criteria (+ / - 25%		Precision Criteria (Note 1)	
	WITHIN CRITERIA	OUTSIDE CRITERIA	WITHIN CRITERIA	OUTSIDE CRITERIA
Gas Flow Total Strontium	231	0	241	0
Gross Alpha Non Vol Beta	1313	0	1554	0
LSC Phosphorus-32	2	0	2	0
Lucas Cell Radium 226 by Method Ra-04	3	0	3	0
ICP-MS Uranium-233, 234 Prep in Liquid	1	0	1	0
Tritium in Drinking Water by EPA 906.0	11	0	14	0
Gamma Spec Liquid RAD A-013 with Ba, La	131	0	211	0
Gamma Spec Liquid RAD A-013 with Iodine	159	0	205	0
Gas Flow Strontium 89 & 90	6	0	0	0
ICP-MS Uranium-235, 236, 238 in Liquid	2	0	2	0
Gas Flow Total Alpha Radium	13	0	11	0
Gross Alpha Co-precipitation	7	0	9	0
ICP-MS Uranium-235, 236, 238 Prep in Liquid	1	0	1	0
ICP-MS Uranium-234, 235, 236, 238 in Liquid	22	0	98	0
Gross Alpha Beta (Americium Calibration) Liquid	16	0	21	0
ICP-MS Uranium-234, 235, 236, 238 Prep in Liquid	14	0	51	0
Alpha/Beta (Americium Calibration) Drinking Water	5	0	4	0
TISSUE				
Carbon-14	2	0	2	0
LSC Iron-55	3	0	3	0
Gamma Nickel 59 RAD A-022	2	0	2	0
Gamma Spec Solid RAD A-013	71	0	79	0
LSC Nickel 63	4	0	4	0
LSC Plutonium	1	0	1	0
Technetium-99	2	0	2	0
Tritium	1	0	1	0
Gamma Iodine-129	2	0	2	0
Gas Flow Lead 210	2	0	2	0
Alpha Spec Uranium	5	0	5	0
Alpha Spec Thorium	2	0	2	0
Alpha Spec Plutonium	10	0	10	0
Alpha Spec Neptunium	4	0	4	0
Alpha Spec Plutonium	2	0	2	0
Gas Flow Sr 2nd count	10	0	10	0
Gas Flow Strontium 90	20	0	23	0
Alpha Spec Am241 Curium	9	0	9	0
Gas Flow Total Strontium	19	0	19	0
Gamma Spec Solid RAD A-013 with Ba, La	6	0	5	0
Gamma Spec Solid RAD A-013 with Iodine	17	0	17	0

ENVIRONMENTAL 2013	Bias Criteria (+ / - 25%		Precision Criteria (Note 1)	
	WITHIN CRITERIA	OUTSIDE CRITERIA	WITHIN CRITERIA	OUTSIDE CRITERIA
Gross Alpha/Beta	2	0	2	0
SEA WATER				
LSC Iron-55	2	0	2	0
LSC Nickel 63	2	0	2	0
Gas Flow Total Strontium	1	0	1	0
Gross Alpha Non Vol Beta	1	0	1	0
Gamma Spec Liquid RAD A-013 with Iodine	1	0	1	0
VEGETATION				
Gamma Nickel 59 RAD A-022	3	0	3	0
Gamma Spec Solid RAD A-013	31	0	31	0
LSC Nickel 63	3	0	3	0
LSC Plutonium	1	0	1	0
Technetium-99	6	0	6	0
Tritium	9	0	9	0
Gamma Iodine-129	1	0	1	0
Gas Flow Lead 210	8	0	7	0
Total Uranium KPA	4	0	4	0
Alpha Spec Uranium	23	0	21	0
Alpha Spec Thorium	7	0	7	0
Alpha Spec Plutonium	15	0	12	0
Alpha Spec Neptunium	1	0	1	0
Alpha Spec Plutonium	1	0	1	0
Gas Flow Sr 2nd count	9	0	9	0
Gas Flow Strontium 90	19	0	18	0
Gas Flow Total Radium	2	0	3	0
Alpha Spec Am241 Curium	11	0	8	0
Gamma Spec Solid RAD A-013 with Iodine	91	0	93	0
Gamma Spec Solid RAD A-013 (pCi/Sample)	5	0	3	0
Alpha Spec Am241 (pCi/Sample)	3	0	2	0
ICP-MS Uranium-234, 235, 236, 238 in Solid	9	0	7	0
Alpha Spec Uranium	1	0	17	0
Gross Alpha/Beta	4	0	4	0
Alpha Spec Plutonium	2	0	2	0
Gas Flow Strontium 90	4	0	2	0
ICP-MS Uranium-234, 235, 236, 238 Prep in Solid	7	0	5	0
AIR CHARCOAL				
Gamma Iodine 131 RAD A-013	623	0	645	0
Gamma Iodine-129	0	0	1	0
Carbon-14 (Ascarite/Soda Lime Filter per Liter)	89	0	88	0
DRINKING WATER				
Alpha Spec Uranium	7	0	8	0
Tritium	51	0	52	0
Iodine-131	1	0	2	0

ENVIRONMENTAL 2013	Bias Criteria (+ / - 25%)		Precision Criteria (Note 1)	
	WITHIN CRITERIA	OUTSIDE CRITERIA	WITHIN CRITERIA	OUTSIDE CRITERIA
LSC Iron-55	24	0	22	0
LSC Nickel 63	23	0	21	0
LSC Radon 222	96	0	96	0
Gamma Spec Liquid RAD A-013	24	0	24	0
Total Activity,	2	0	2	0
Gamma Iodine-129	2	0	2	0
Gamma Iodine-131	38	0	38	0
Total Uranium KPA	15	0	28	0
Gas Flow Radium 228	42	0	42	0
Alpha Spec Plutonium	6	0	6	0
Gas Flow Sr 2nd count	16	0	16	0
Gas Flow Strontium 90	25	0	24	0
Lucas Cell Radium-226	58	6	78	0
Alpha Spec Am241 Curium	6	0	6	0
Gas Flow Total Strontium	31	0	31	0
Gross Alpha Non Vol Beta	343	0	287	0
Tritium in Drinking Water by EPA 906.0	37	0	34	0
Gamma Spec Liquid RAD A-013 with Ba, La	44	0	98	0
Gas Flow Strontium 89 & 90	20	0	13	0
Gas Flow Total Alpha Radium	1	0	1	0
Gross Alpha Co-precipitation	105	0	87	0
Alpha/Beta (Americium Calibration) Drinking Water	13	0	13	0
ECLS-R-GA NJ 48 Hr Rapid Gross Alpha	8	0	8	0
Total	**20148**		**23892**	

Note 1: The RPD must be 20 percent or less, if both samples are greater than 5 times the MDC. If both results are less than 5 times MDC, then the RPD must be equal to or less than 100%. If one result is above the MDC and the other is below the MDC, then the RPD can be calculated using the MDC for the result of the one below the MDC. The RPD must be 100% or less. In the situation where both results are above the MDC but one result is greater than 5 times the MDC and the other is less than 5 times the MDC, the RPD must be less than or equal to 20%. If both results are below MDC, then the limits on % RPD are not applicable.

TABLE 8

2013 CORRECTIVE ACTION REPORT SUMMARY

CORRECTIVE ACTION ID# & PE FAILURE	DISPOSITION
CARR130513-789 ISO Documentation of PT Failures in MAPEP-13-RdV28 for Uranium in Vegetation by ICP/MS and Alpha Spec	**Root Cause Analysis of MAPEP-13-RdV28 Uranium-234/233, Uranium-235, Uranium-238 and Total Uranium** Following reviews of our process and data and conversations with personnel from the affected laboratories, it was determined that all failures were due to an analyst error during sample preparation. Glass instead of Teflon beakers were used during the sample digestion which contained Hydrofluoric (HF) acid. Per Standard Operating Procedure (SOP) GL-RAD-A-015 section 11.2.4, the sample should have been transferred to a Teflon beaker. In this instance, this step was omitted. The digestion was performed in glass beakers so trace amounts of Uranium were leached from the glass into the sample, resulting in high bias in the results. Normal procedure dictates that glass is not used when using HF in the digestion process due to the presence of natural Uranium in the glassware. In order to prove that this was an isolated incident and that our overall process is in control a series of digestions were performed in the glass beakers to confirm our conclusion. • HCL /HNO_3 only digestion - Uranium was not detected. • HCL, HNO_3, and HF digestion - Enough Uranium activity was detected to account for the high bias (as many as 70 counts in a 16 hour and 40 minute count). • HF only digestion - Results similar to HCL, HNO_3, and HF were observed A second PT was successfully analyzed for this matrix.
CARR130522-791 ISO Documentation of PT Failures in –MRAD-18 for Cesium-134, Cesium-137 and Zinc-65 in Soil	Following a review of our processes, the data and conversations with personnel from the affected laboratories, it was determined that our normal procedure for preparing soil samples is not sufficient for this soil matrix. Per the Standard Operating Procedure (SOP) GL-RAD-A-021, the sample was dried, homogenized, and passed through a 28 mesh sieve. However, approximately 20-30% of the sample consists of particles greater than the 28 mesh sieve size. These larger particles were not affected by our normal homogenization

CARR130522-791 ISO Documentation of PT Failures in –MRAD-18 for Cesium-134, Cesium-137 and Zinc-65 in Soil	process. In accordance with the SOP, the larger particles were removed prior to preparing the container for gamma counting. Upon receipt of the graded report, the following steps were taken to prove that this was an isolated incident and that our overall process is in control. 1. A recount of the initially prepared sample performed and confirmed the originally reported results. 2. A new container was then prepared from the original sample but omitting the preparation step and counted. This produced acceptable results. 3. A second sample was prepared per the SOP; however, only a portion of the sample was removed during the sieving steps. This sample produced similar high biased results. An aliquot of the sample was then pulverized prior to gamma counting. This approach also produced acceptable results. **Permanent Corrective/Preventive Actions or Improvements** : In the future, these samples will be pulverized to ensure that all the material passes through the 28 mesh sieve; thus, eliminating the need to remove any of the original sample. A comment has been added to the set-up for the solid matrix. A second PT was successfully analyzed for this matrix.

CARR130826-810 For Failures of RAD-94 for Gross Alpha/Bea and Strontium 89/90 in Water	**Root Cause Analysis of Gross Alpha** After a review of the data, an apparent reason for this discrepancy could not be determined. The following steps were taken to prove that this high bias was an isolated occurrence and that our overall process is within control. 1. The batch quality control samples were reviewed and found to be compliant. The LCS recovered at 110%. While the recovery is slightly elevated, it is well within the 80%-120% acceptance range. 2. Laboratory control data were also reviewed for trends. None were noted. 3. The instrument calibrations were reviewed for positive biases that could have attributed to this failure. None were noted. 4. Two sample duplicates were also prepared and counted along with the reported result. Both results fell within the method's acceptance range for duplicate. One of the results also fell within the acceptance range of the study. 5. The original sample was also recounted and the results fell within the acceptance range. **Root Cause Analysis of Strontium-89 (Sr-89)** **LAB PBMS A-004** After a review of the data, an apparent reason for this discrepancy could not be determined. The following steps were taken to prove that this high bias was an isolated occurrence and that our overall process is within control. 1. The batch quality control samples were reviewed and found to be compliant. The LCS recovered at 98.1%. 2. Laboratory control data were also reviewed for trends. None were noted. 3. The instrument calibrations were reviewed for positive biases that could have attributed to this failure. None were noted. 4. Sample duplicates were also prepared and counted along with the reported result. Duplicate results fell within the acceptance range of the study. **Root Cause Analysis of Strontium-89 (Sr-89)** **EPA 905.0** After a review of the data, an apparent reason for this discrepancy could not be determined. The following steps were taken to prove that this high bias was an isolated occurrence and that our overall process is within control. 1. The batch quality control samples were reviewed and found to be compliant. The LCS recovered at 102%.

CARR130826-810 For Failures of RAD-94 for Gross Alpha/Bea and Strontium 89/90 in Water	2. Laboratory control data were also reviewed for trends. None was noted. 3. The instrument calibrations were reviewed for positive biases that could have attributed to this failure. None were noted. 4. Sample duplicates were also prepared and counted along with the reported result. All results fell within the method's acceptance range for duplicates. **Permanent Corrective/Preventive Actions or Improvements:** **Gross Alpha** The laboratory must assume an unidentified random error caused the high bias because all quality control criteria were met for the batch. The lab will continue to monitor the recoveries of this radionuclide to ensure that there are no issues. **Strontium-89 (Sr-89)** **LAB PBMS A-004 and EPA 905.0** To summarize our efforts (including the initial result), the laboratory had 3 analysts, two different methods, processed with 2 calibrations and two separate Y carriers used in the analysis of this sample and only one acceptable result for Sr-89. All LCS results have met acceptance criteria. This leads the laboratory to conclude that there is possibly an error in the original make-up of the PT sample. The instructions list stable Sr and Y as being included but they are not at levels greater than are normally listed so we suspect that the make up of the sample was the cause. The laboratory will continue to monitor the recoveries from these two methods to ensure that there are no issues.

CARR131205-845 For failures of MRAD-19 for Uranium-234 and Total Uranium in Vegetation	**Root Cause Analysis** These elevated results were obtained following our routine procedure. The reported result for U-234 was less than the MDA and had a elevated uncertainty. This high U-234 result also attributed to the high Total-U result. Upon receipt of the graded report, the following steps were taken to prove that this was an isolated incident and that our overall process is in control. • A recount of the initially prepared sample performed and confirmed the originally reported results. • The sample was reanalyzed using a larger aliquot and results that fell within the acceptance range were achieved. **Permanent Corrective/Preventive Actions or Improvements** In the future when the result is below the MDA and are not compatible with other analytical technologies, the laboratory will attempt to use a larger sample aliquot with hopes of achieve a result above the MDA or with a lower uncertainty. If the matrix and larger sample size do not provide useable data, the results may not be reported.