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GNRO-2015/00027

April 23, 2015

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

SUBJECT: Grand Gulf Nuclear Station 2014 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 Unit 1 Technical Specification 5.6.2, attached is the Annual Radiological Environmental Operating Report (AREOR) for the time period of January 1, 2014 through December 31, 2014.

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

Sincerely,

JN/tmc

Attachment: Grand Gulf Nuclear Station 2014 Annual Radiological Environmental Operating Report (AREOR)

cc: (see next page)

cc:

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

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Attachment 1
to GNRO-2015/00027

Grand Gulf Nuclear Station 2014 Annual Radiological Environmental Operating Report
(AREOR)

ENTERGY OPERATIONS, INC.
GRAND GULF NUCLEAR STATION

ANNUAL
RADIOLOGICAL ENVIRONMENTAL
OPERATING REPORT

January 1, 2014 - December 31, 2014

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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, 2014, through December 31, 2014. 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 2014, 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 2014 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 2014, 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 2014 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 2014, 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 2014 were within the limits for all samples.

- **Thermoluminescent Dosimeters**

  TLD M-50 was retrieved wet in the 2nd quarter. TLD M-98 was retrieved wet in the 4th quarter. Similarly located TLD data were reviewed and found consistent with previous data, with readings near background.

  For the first quarter of 2014, a higher than average result for TLD M-33 was reported. TLD M-33 is considered a control location. Follow up inspection by the vendor, Stanford Dosimetry, determined that the TLD had been damaged, and the initially reported result was not reliable. The sampling field notes show no indication of damage to TLD M-33 during collection. The analytical result for M-33 for the first quarter of 2014 are not included in the TLD data evaluations in this report.

- **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 2014

Sample Location	Date In	Date Out	Run Time (Hours)	Out-of-Service (Hours)	Comments
AS-1 PG	01/21/14	01/29/14	190.76	61.4	Power outage
AS-7 UH	02/25/14	03/04/14	168.04	32.6	Power outage
AS-7 UH	03/25/14	04/01/14	152.46	976.4	Power outage
AS-1 PG	03/25/14	04/01/14	165.55	188.0	Power outage
AS-7 UH	04/08/14	04/15/14	171.43	30.2	Power outage
AS-3 61VA	04/15/14	04/22/14	168.16	49.4	Power outage
AS-1 PG	06/03/14	06/10/14	165.89	326.6	Power outage
AS-3 61VA	06/03/14	06/10/14	174.42	326.8	Power outage
AS-7 UH	06/03/14	06/10/14	167.52	327.8	Power outage
AS-1 PG	06/10/14	06/17/14	162.09	96.6	Power outage
AS-7 UH	09/30/14	10/07/14	158.64	222.6	Power outage

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

AS-1 PG	99.9%
AS-3 61VA	99.9%
AS-7 UH	99.7%

- **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 1.2 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 2012 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 2012 and 2014.

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 1.2
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 1.2
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 1.2
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 1.2
Radiological Environmental Sampling Program

Exposure Pathway	Requirement	Sample Point Description, Distance and Direction	Sampling and Collection Frequency	Type and Frequency Of Analyses
Direct Radiation	<u>TLDs</u> 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 1.2
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 1.2
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 1.2
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

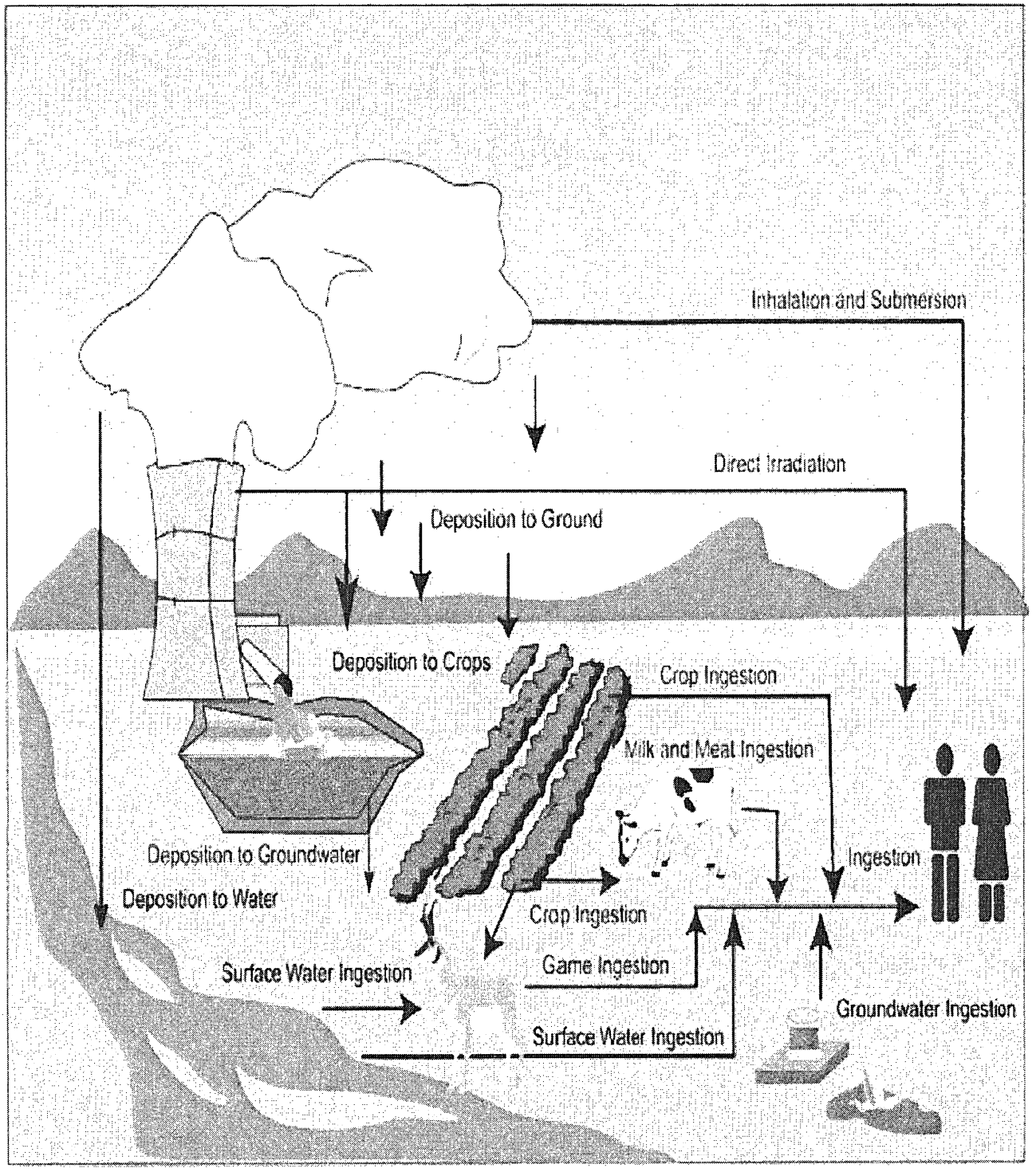


FIGURE 1-2
SAMPLE COLLECTION SITES – NEAR FIELD

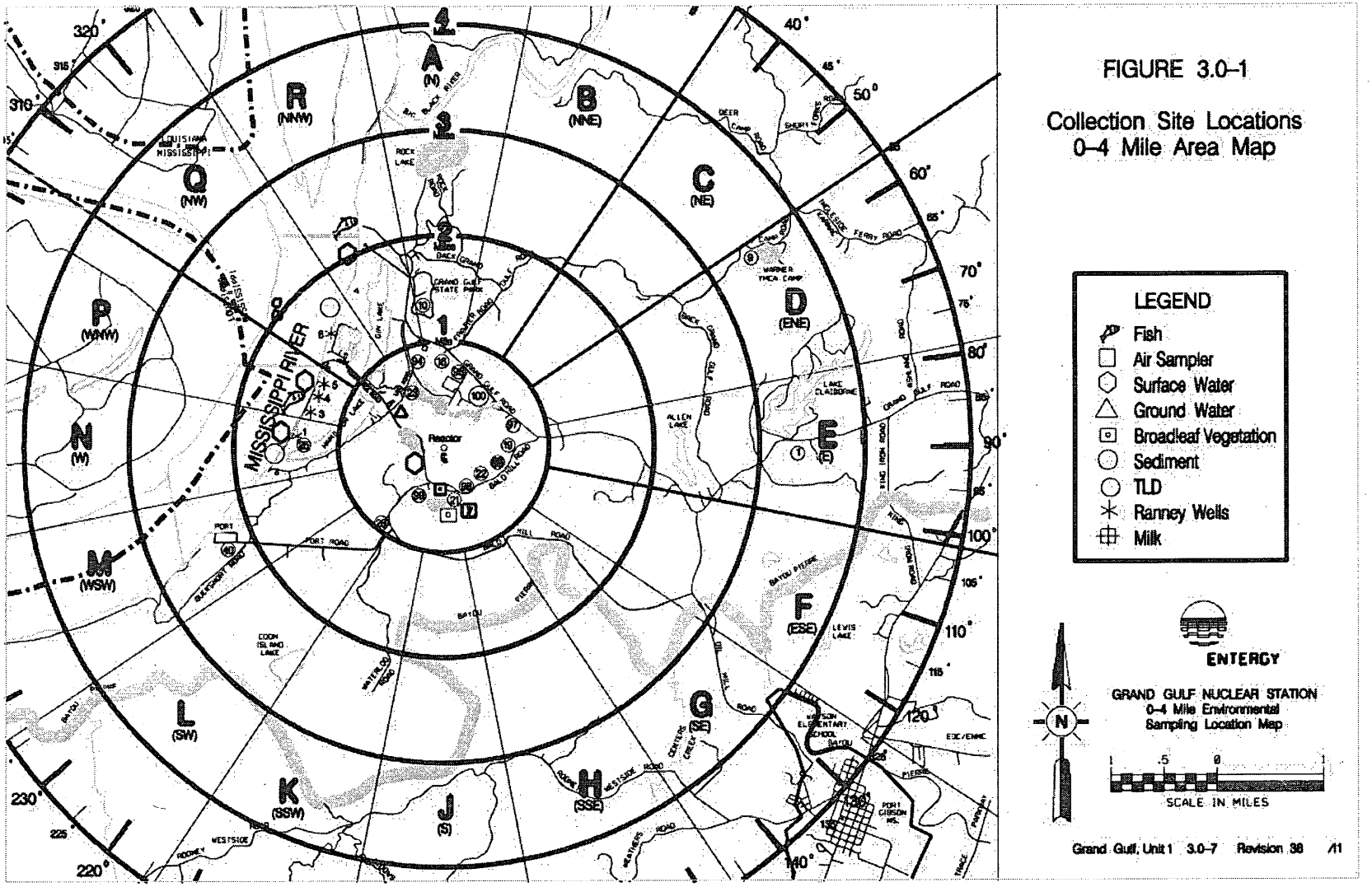
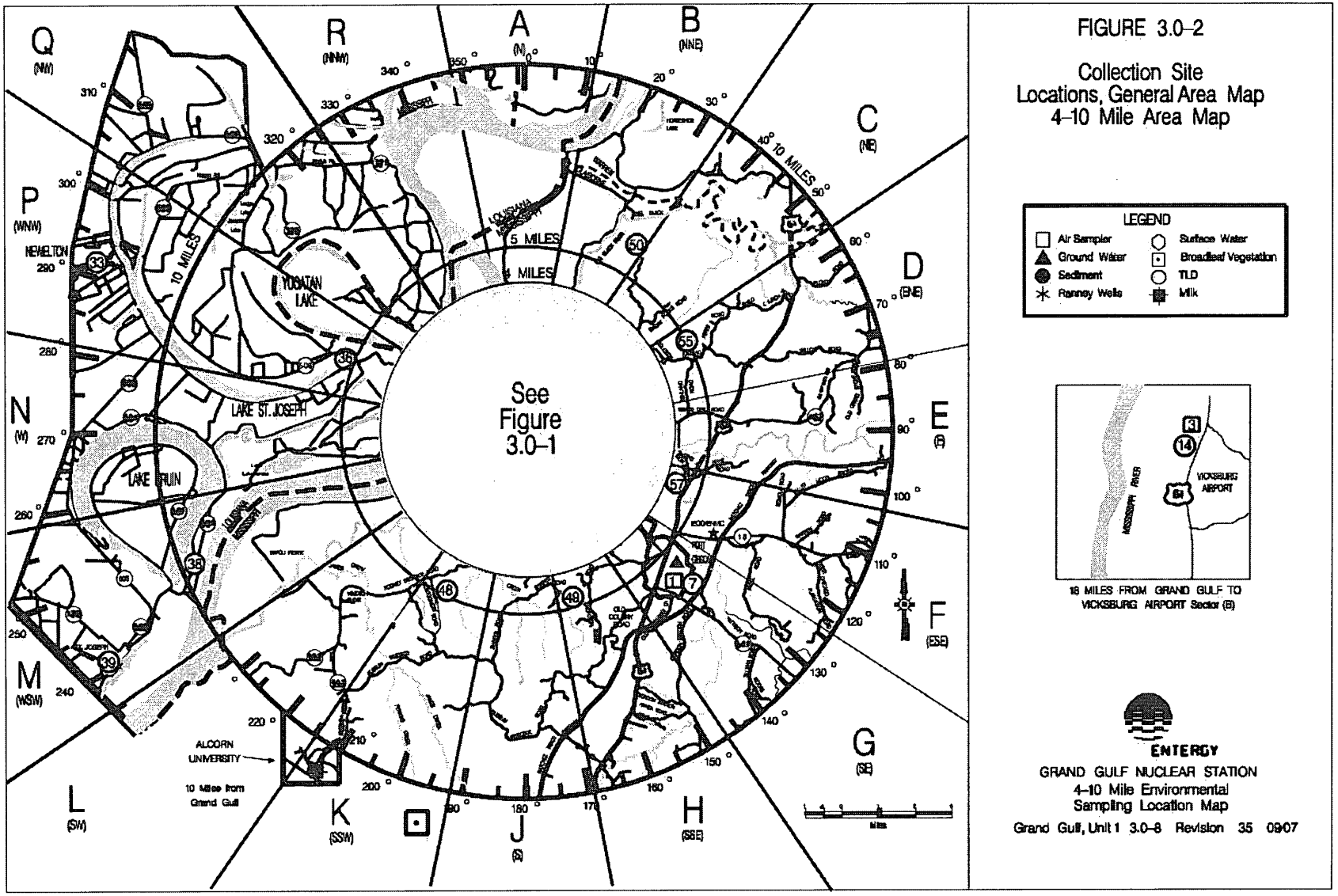


FIGURE 1-3
SAMPLE COLLECTION SITES – FAR FIELD



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 2014.

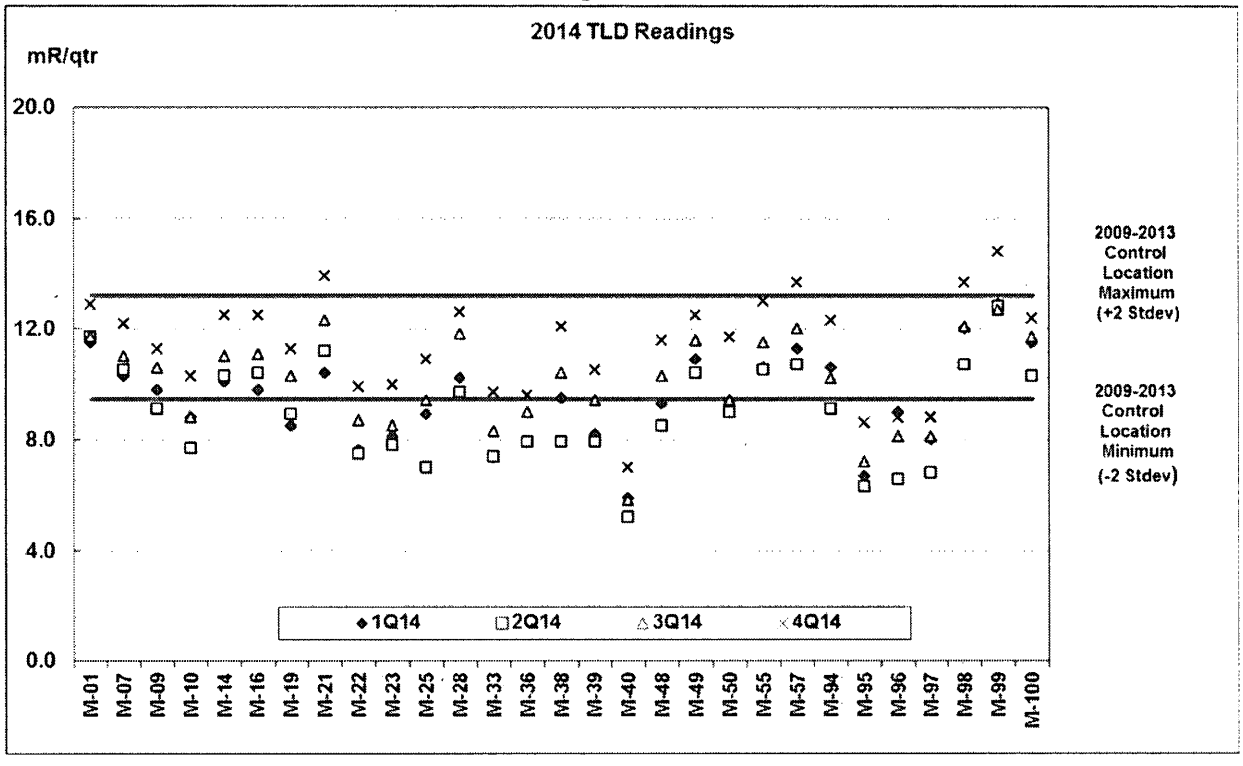
Table 3.1, which also includes gross beta activity, provides a comparison of the indicator and control means and ranges, further emphasizing that the airborne pathway remains at background levels. In the absence of plant-related gamma radionuclides, gross beta activity is attributed to naturally occurring 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 February 2014, tritium was measured at a concentration of 1492 ±374 pCi/L at the Outfall 007 (indicator) location. Tritium was not observed in the remaining Outfall 007 samples collected during 2014.

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 locations 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 this reporting period, plant related gamma emitting radionuclides were below detectable concentrations in the upstream (control) location. Cesium-137 was detected at an average concentration of 39.4 $\pm$ 25 pCi/kg in the downstream (indicator) location.

A review of REMP data collected at the downstream location from 1983 through 2013 indicates the Cesium-137 concentration has ranged from less than detectable to 300 pCi/Kg. Cesium-137 has previously been detected in the upstream (control) location. The presence of Cesium-137 is attributed to atmospheric weapons testing.

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.

In addition to the food product samples required by the REMP, one special meat sample from deer harvested on the site property was analyzed for gamma emitting

radionuclides (Table A 8.1), in accordance with site procedure 06-EN-S000-V-0001 section 5.8. This sample is not required by the REMP, and is included as supplemental data. Plant related gamma emitting radionuclides were undetectable in the meat sample.

2.8 Land Use Census Results

Results from the Land Use Census performed in 2014 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 and 6.12.2. 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 Sectors F, 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, aerial photographs, and interviews.
- Gardens, regardless of size, were included in the census data

Based on evaluation of the Land Use Census data, no ODCM revision is required.

Table 2.1
2014 Land Use Census

Parameter		Sector A*	Sector B	Sector C*	Sector D*
I. Nearest Occupied Residence	a. Distance (mile) b. Degrees from true north	1.76 351.6	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	1.02 ≈ 400 355.4	1.52 ≈ 4050 21.9	4.53 ≈ 25 49.1	3.06 ≈ 1200 58.8
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?	No N/A No	Yes N/A Yes[1]	Yes N/A No	Yes N/A No

1 Retained previous garden location. Located no other gardens in the sector.

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

Table 2.1
2014 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	0.89 86.9	2.25 101.3	3.72 134.1	1.10 151.4
II. Nearest Unoccupied Residence (closer than occupied residence)	a. Distance (miles) b. Degrees from true north	None	None	3.71 131.8	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	4.50 ≈ 450 110.0	4.20 ≈ 1600 130.1	4.39 ≈ 200 155.0
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[1] N/A Yes	Yes N/A No	No N/A No	Yes N/A Yes

1 – Nearest occupied residence location is the same as last census. Location data revised due to new mapping method.

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

Table 2.1
2014 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 ≈ 400 219.5	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
2014 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	None	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? b. Is nearest milk animal in same location as last census? c. Is nearest broadleaf garden in same location as last census?	N/A N/A N/A	N/A N/A N/A	N/A N/A N/A	Yes N/A N/A

2014 Land Use Census Changes

SECTOR	PARAMETER	Reason for Change
A	Nearest Occupied Residence	Nearest occupied residence from 2012 census no longer occupied. New nearest occupied residence identified in 2014.
A	Nearest Broadleaf Garden	No garden location identified in 2012 census. New garden location identified in 2014.
C	Nearest Broadleaf Garden	Garden location identified in 2012 census no longer active. New nearest garden location identified in 2014.
D	Nearest Broadleaf Garden	New nearest garden location identified in 2014.
E	Nearest Occupied Residence	Nearest occupied residence is the same as previous census. Location data revised due to new mapping method.
F	Nearest Broadleaf Garden	New nearest garden location identified in 2014.
G	Nearest Occupied Residence	Nearest occupied residence from 2012 census no longer occupied. New nearest occupied residence identified in 2014.
G	Nearest Broadleaf Garden	Nearest garden location from 2012 census no longer planted. New nearest garden location identified in 2014.

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 2014

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 156	0.01	0.0310 (104/104) [0.0097 - 0.0616]	AS-1 PG (Sector G, 5.5 mi)	0.0316 (52/52) [0.0102-0.0616]	0.0292 (52/52) [0.0086 - 0.0604]	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-131 156	0.07	<LLD	N/A	N/A	<LLD	0
Inner Ring TLDs (mR/Qtr)	Gamma 56	f	10.0 (56/56) [6.3 – 14.8]	M-99 (Sector J, 0.4 mi.)	13.3 (4/4) [12.7 – 14.8]	N/A	0
Outer Ring TLDs (mR/Qtr)	Gamma 28	f	9.9 (28/28) [5.2 – 13.7]	M-57 (Sector F, 4.5 mi.)	11.9 (4/4) [10.7 – 13.7]	N/A	0
Special Interest TLDs (mR/Qtr)	Gamma 28	f	10.3 (28/28) [7.4 – 20.1]	M-01 (Sector E, 3.5 mi.)	12.0 (4/4) [11.5 – 12.9]	N/A	0
Control TLDs (mR/Qtr)	Gamma 4	f	N/A	N/A	N/A	11.0 (4/4) [10.1 – 12.5]	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 2014

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 30	3000	1817 (1/14) [1492]	Outfall 007 (Sector N, Radius 0.2 mi.)	1817 (1/14) [1492]	<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 2014

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 3	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 2						
	Cs-134	150	<LLD	N/A	N/A	<LLD	0
	Cs-137	180	39.39 (1/1) [39.39]	SEDHAM (Sector N, 1.6 Miles)	39.39 (1/1) [39.39]	<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 2014

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 4						
	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 10	60	<LLD	N/A	N/A	<LLD	0
	GS 10						
	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 2014

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]		
Meat (Special) (pCi/l)	GS 1						
	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
	Cs-134	15	<LLD	N/A	N/A	<LLD	0
	Cs-137	18	<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	
340961004	12/31/13	01/07/14	< 0.0134	0.04669	+/-0.00554
341489004	01/07/14	01/14/14	< 0.0248	0.02244	+/-0.00393
341839004	01/14/14	01/21/14	< 0.0223	0.01987	+/-0.00372
342164004	01/21/14	01/29/14	< 0.0234	0.0390	+/-0.00481
342457004	01/29/14	02/04/14	< 0.0337	0.02417	+/-0.00434
342999004	02/04/14	02/11/14	< 0.0195	0.02937	+/-0.00444
343303004	02/11/14	02/18/14	< 0.0171	0.03345	+/-0.00476
343772004	02/18/14	02/25/14	< 0.0148	0.02173	+/-0.00384
344067004	02/25/14	03/04/14	< 0.0226	0.03161	+/-0.00461
344619004	03/04/14	03/11/14	< 0.0381	0.03895	+/-0.00514
344943004	03/11/14	03/18/14	< 0.022	0.02276	+/-0.00387
345331004	03/18/14	03/25/14	< 0.0301	0.0318	+/-0.0047
345693001	03/25/14	04/01/14	< 0.0326	0.02732	+/-0.00432
346553004	04/01/14	04/08/14	< 0.0312	0.02419	+/-0.00407
347006004	04/08/14	04/15/14	< 0.042	0.02067	+/-0.00373
347471004	04/15/14	04/22/14	< 0.0138	0.05222	+/-0.0059
347858004	04/22/14	04/29/14	< 0.0222	0.02786	+/-0.00437
348335004	04/29/14	05/06/14	< 0.022	0.03754	+/-0.00509
348883004	05/06/14	05/13/14	< 0.0395	0.02833	+/-0.00435
349205004	05/13/14	05/20/14	< 0.013	0.02623	+/-0.00428
349706004	05/20/14	05/27/14	< 0.0344	0.04886	+/-0.00575
350161004	05/27/14	06/03/14	< 0.0363	0.01023	+/-0.00279
350610004	06/03/14	06/10/14	< 0.0325	0.01035	+/-0.00276
350879004	06/10/14	06/17/14	< 0.0248	0.02688	+/-0.00435
351424001	06/17/14	06/24/14	< 0.0164	0.02955	+/-0.00438
351783004	06/24/14	07/01/14	< 0.0461	0.02105	+/-0.00389
352330004	07/01/14	07/08/14	< 0.0159	0.03515	+/-0.00487
352845004	07/08/14	07/15/14	< 0.0328	0.02597	+/-0.00419
353372004	07/15/14	07/22/14	< 0.0378	0.01949	+/-0.00364
353766004	07/22/14	07/29/14	< 0.0294	0.03233	+/-0.00468
354269004	07/29/14	08/05/14	< 0.0288	0.03508	+/-0.0048
354720004	08/05/14	08/12/14	< 0.0248	0.02372	+/-0.00406
355215004	08/12/14	08/19/14	< 0.0383	0.02807	+/-0.00437
355619004	08/19/14	08/26/14	< 0.0195	0.03025	+/-0.00448
355880004	08/26/14	09/02/14	< 0.00976	0.01594	+/-0.00337

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	
356638004	09/02/14	09/09/14	< 0.0213	0.02202	+/-0.00387
356995004	09/09/14	09/16/14	< 0.0212	0.02922	+/-0.00443
357505004	09/16/14	09/23/14	< 0.0153	0.04019	+/-0.00518
358413004	09/23/14	09/30/14	< 0.0331	0.03333	+/-0.00467
358535004	09/30/14	10/07/14	< 0.0184	0.02965	+/-0.00454
359166004	10/07/14	10/14/14	< 0.0162	0.02888	+/-0.00443
359683004	10/14/14	10/21/14	< 0.0305	0.06161	+/-0.00783
360209004	10/21/14	10/28/14	< 0.034	0.05208	+/-0.00716
360702004	10/28/14	11/04/14	< 0.0149	0.03394	+/-0.00474
361199004	11/04/14	11/11/14	< 0.0282	0.04031	+/-0.00521
361662004	11/11/14	11/18/14	< 0.0294	0.02785	+/-0.00433
362062004	11/18/14	11/25/14	< 0.0361	0.03725	+/-0.00498
362389004	11/25/14	12/02/14	< 0.0383	0.02751	+/-0.0043
363028004	12/02/14	12/09/14	< 0.0245	0.06018	+/-0.00626
363445004	12/09/14	12/16/14	< 0.032	0.04673	+/-0.00562
363792004	12/16/14	12/23/14	< 0.031	0.04481	+/-0.00551
363939004	12/23/14	12/30/14	< 0.0527	0.02715	+/-0.00428
L61599	12/30/14	01/06/15	< 0.0500	0.0196	+/-0.00357
Average:				0.0313	
Maximum:				0.0616	
Minimum:				0.0102	

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	
340961005	12/31/13	01/07/14	< 0.013	0.04805	+/-0.00559
341489005	01/07/14	01/14/14	< 0.033	0.02221	+/-0.00395
341839005	01/14/14	01/21/14	< 0.0165	0.02017	+/-0.00372
342164005	01/21/14	01/29/14	< 0.017	0.03658	+/-0.00464
342457005	01/29/14	02/04/14	< 0.034	0.01914	+/-0.0039
342999005	02/04/14	02/11/14	< 0.0264	0.02717	+/-0.00429
343303005	02/11/14	02/18/14	< 0.0111	0.03512	+/-0.00486
343772005	02/18/14	02/25/14	< 0.0226	0.02018	+/-0.00371
344067005	02/25/14	03/04/14	< 0.026	0.0255	+/-0.00414
344619005	03/04/14	03/11/14	< 0.0222	0.03105	+/-0.00459
344943005	03/11/14	03/18/14	< 0.0299	0.01579	+/-0.00329
345331005	03/18/14	03/25/14	< 0.0251	0.0262	+/-0.00425
345693005	03/25/14	04/01/14	< 0.0277	0.02253	+/-0.00391
346553005	04/01/14	04/08/14	< 0.0366	0.01668	+/-0.00339
347006005	04/08/14	04/15/14	< 0.0306	0.02044	+/-0.00369
347471002	04/15/14	04/22/14	< 0.0227	0.02717	+/-0.00428
347858005	04/22/14	04/29/14	< 0.0243	0.0230	+/-0.00406
348335005	04/29/14	05/06/14	< 0.0206	0.0289	+/-0.00441
348883005	05/06/14	05/13/14	< 0.0317	0.02191	+/-0.00396
349205005	05/13/14	05/20/14	< 0.0249	0.01904	+/-0.00365
349706005	05/20/14	05/27/14	< 0.0363	0.04752	+/-0.00564
350161005	05/27/14	06/03/14	< 0.0398	0.01155	+/-0.00293
350610005	06/03/14	06/10/14	< 0.0373	0.008584	+/-0.00247
350879005	06/10/14	06/17/14	< 0.0131	0.02368	+/-0.00417
351424005	06/17/14	06/24/14	< 0.0178	0.02562	+/-0.00416
351783005	06/24/14	07/01/14	< 0.0378	0.02195	+/-0.00389
352330005	07/01/14	07/08/14	< 0.0143	0.02568	+/-0.00419
352845005	07/08/14	07/15/14	< 0.033	0.02924	+/-0.00444
353372005	07/15/14	07/22/14	< 0.0277	0.01786	+/-0.00349
353766005	07/22/14	07/29/14	< 0.0266	0.03909	+/-0.00514
354269005	07/29/14	08/05/14	< 0.0331	0.03375	+/-0.00478
354720005	08/05/14	08/12/14	< 0.0321	0.02973	+/-0.00446
355215005	08/12/14	08/19/14	< 0.0445	0.02757	+/-0.00433
355619005	08/19/14	08/26/14	< 0.0263	0.02844	+/-0.00439

355880005	08/26/14	09/02/14	< 0.029	0.0210	+/-0.00379

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	
356638005	09/02/14	09/09/14	< 0.0316	0.02677	+/-0.00425
356995005	09/09/14	09/16/14	< 0.029	0.02724	+/-0.00431
357505005	09/16/14	09/23/14	< 0.0199	0.03448	+/-0.00482
358413005	09/23/14	09/30/14	< 0.0276	0.02934	+/-0.0043
358535005	09/30/14	10/07/14	< 0.0203	0.02406	+/-0.00416
359166005	10/07/14	10/14/14	< 0.0146	0.02594	+/-0.00421
359683005	10/14/14	10/21/14	< 0.0271	0.05999	+/-0.00773
360209005	10/21/14	10/28/14	< 0.033	0.05325	+/-0.00724
360702005	10/28/14	11/04/14	< 0.0276	0.03138	+/-0.0046
361199005	11/04/14	11/11/14	< 0.0204	0.03424	+/-0.00477
361662005	11/11/14	11/18/14	< 0.0205	0.03093	+/-0.00455
362062005	11/18/14	11/25/14	< 0.0343	0.03936	+/-0.00511
362389005	11/25/14	12/02/14	< 0.0309	0.02247	+/-0.0039
363028005	12/02/14	12/09/14	< 0.0414	0.06044	+/-0.00626
363445002	12/09/14	12/16/14	< 0.0366	0.04554	+/-0.0056
363792005	12/16/14	12/23/14	< 0.0263	0.04349	+/-0.0054
363939005	12/23/14	12/30/14	< 0.0356	0.02976	+/-0.00447
L61599	12/30/14	01/06/15	< 0.0501	0.02191	+/-0.00355
Average:				0.0290	
Maximum:				0.0604	
Minimum:				0.0086	

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	
340961006	12/31/13	01/07/14	< 0.0123	0.0406	+/-0.00518
341489006	01/07/14	01/14/14	< 0.026	0.02459	+/-0.0041
341839006	01/14/14	01/21/14	< 0.0223	0.01952	+/-0.00369
342164006	01/21/14	01/29/14	< 0.014	0.0395	+/-0.00482
342457006	01/29/14	02/04/14	< 0.0133	0.0224	+/-0.00421
342999006	02/04/14	02/11/14	< 0.0427	0.0314	+/-0.00458
343303006	02/11/14	02/18/14	< 0.0127	0.03887	+/-0.00513
343772006	02/18/14	02/25/14	< 0.0196	0.03099	+/-0.00455
344067006	02/25/14	03/04/14	< 0.0203	0.03193	+/-0.00463
344619006	03/04/14	03/11/14	< 0.0273	0.03997	+/-0.00522
344943006	03/11/14	03/18/14	< 0.0233	0.01706	+/-0.00343
345331006	03/18/14	03/25/14	< 0.027	0.02673	+/-0.00427
345693006	03/25/14	04/01/14	< 0.0305	0.02657	+/-0.00445
346553006	04/01/14	04/08/14	< 0.0207	0.01704	+/-0.00344
347006006	04/08/14	04/15/14	< 0.0315	0.02359	+/-0.00397
347471006	04/15/14	04/22/14	< 0.0168	0.03742	+/-0.005
347858006	04/22/14	04/29/14	< 0.0179	0.0274	+/-0.00437
348335006	04/29/14	05/06/14	< 0.0238	0.0356	+/-0.00491
348883006	05/06/14	05/13/14	< 0.036	0.02816	+/-0.00434
349205006	05/13/14	05/20/14	< 0.0184	0.02296	+/-0.00402
349706006	05/20/14	05/27/14	< 0.026	0.03632	+/-0.00496
350161003	05/27/14	06/03/14	< 0.0335	0.009739	+/-0.00273
350610006	06/03/14	06/10/14	< 0.0387	0.01073	+/-0.00279
350879006	06/10/14	06/17/14	< 0.0126	0.02813	+/-0.00444
351424006	06/17/14	06/24/14	< 0.0203	0.02477	+/-0.00402
351783003	06/24/14	07/01/14	< 0.0385	0.02243	+/-0.00401
352330006	07/01/14	07/08/14	< 0.022	0.02569	+/-0.00419
352845006	07/08/14	07/15/14	< 0.0342	0.02462	+/-0.00409
353372006	07/15/14	07/22/14	< 0.0261	0.01473	+/-0.0032
353766006	07/22/14	07/29/14	< 0.0251	0.03547	+/-0.0049
354269006	07/29/14	08/05/14	< 0.0217	0.03726	+/-0.00495
354720006	08/05/14	08/12/14	< 0.0382	0.02016	+/-0.00375
355215006	08/12/14	08/19/14	< 0.0328	0.02906	+/-0.00445
355619006	08/19/14	08/26/14	< 0.0343	0.03258	+/-0.00465
355880006	08/26/14	09/02/14	< 0.0172	0.01973	+/-0.00371

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	
356638006	09/02/14	09/09/14	< 0.0405	0.02348	+/-0.00399
356995006	09/09/14	09/16/14	< 0.0268	0.02991	+/-0.00448
357505006	09/16/14	09/23/14	< 0.0195	0.04132	+/-0.00525
358413006	09/23/14	09/30/14	< 0.0389	0.03195	+/-0.00457
358535006	09/30/14	10/07/14	< 0.0141	0.02903	+/-0.00455
359166006	10/07/14	10/14/14	< 0.0116	0.0223	+/-0.00392
359683006	10/14/14	10/21/14	< 0.031	0.05997	+/-0.00773
360209006	10/21/14	10/28/14	< 0.0307	0.05034	+/-0.00704
360702006	10/28/14	11/04/14	< 0.0381	0.03345	+/-0.0047
361199006	11/04/14	11/11/14	< 0.0184	0.03627	+/-0.00495
361662006	11/11/14	11/18/14	< 0.0298	0.03109	+/-0.00457
362062006	11/18/14	11/25/14	< 0.027	0.03354	+/-0.00472
362389006	11/25/14	12/02/14	< 0.0245	0.03002	+/-0.00448
363028006	12/02/14	12/09/14	< 0.0328	0.05834	+/-0.00616
363445006	12/09/14	12/16/14	< 0.0419	0.0477	+/-0.0057
363792006	12/16/14	12/23/14	< 0.0243	0.0407	+/-0.00525
363939006	12/23/14	12/30/14	< 0.0335	0.02405	+/-0.00404
L61599	12/30/14	01/06/15	< 0.0499	0.0228	+/-0.00378
Average:				0.0302	
Maximum:				0.0600	
Minumum:				0.0097	

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

LLD (pCi/m3)			0.05		0.06
LAB ID	LOCATION	DATE	CS-134		CS-137
347217002	AS-3 61VA	02/14/14	0.1267	+/-0.0163	< 0.000662
347217001	AS-1 PG	02/14/14	0.1324	+/-0.0173	< 0.00071
347217003	AS-7 UH	02/14/14	0.1404	+/-0.019	< 0.000977
353670002	AS-3 61VA	05/16/14	0.1198	+/-0.0212	< 0.000982
353670001	AS-1 PG	05/16/14	0.1566	+/-0.0211	< 0.000735
353670003	AS-7 UH	05/16/14	0.1519	+/-0.0193	< 0.000708
360405001	AS-1 PG	08/15/14	0.1168	+/-0.0193	< 0.000702
360405003	AS-7 UH	08/15/14	0.09427	+/-0.0211	< 0.000764
360405002	AS-3 61VA	08/15/14	0.1286	+/-0.0204	< 0.000851
365218001	AS-1 PG	11/14/14	0.09448	+/-0.0139	< 0.000628
365218003	AS-7 UH	11/14/14	0.07944	+/-0.0151	< 0.00056
365218002	AS-3 61VA	11/14/14	0.07654	+/-0.0135	< 0.000509

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	9.8	10.4	11.1	12.5	11.0
M-19	8.5	8.9	10.3	11.3	9.7
M-21	10.4	11.2	12.3	13.9	11.9
M-22	7.6	7.5	8.7	9.9	8.4
M-23	8.1	7.8	8.5	10.0	8.6
M-25	8.9	7.0	9.4	10.9	9.1
M-28	10.2	9.7	11.8	12.6	11.1
M-94	10.6	9.1	10.2	12.3	10.5
M-95	6.7	6.3	7.2	8.6	7.2
M-96	9.0	6.6	8.1	8.8	8.1
M-97	8.0	6.8	8.1	8.8	7.9
M-98	12.0	10.7	12.1	13.7	12.1
M-99*	12.9	12.8	12.7	14.8	13.3
M-100	11.5	10.3	11.7	12.4	11.5

*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	7.9	7.9	9.0	9.6	8.6
M-40	5.9	5.2	5.8	7.0	6.0
M-48	9.3	8.5	10.3	11.6	9.9
M-49	10.9	10.4	11.6	12.5	11.3
M-50	9.4	9.0	9.4	11.7	9.9
M-55	10.6	10.5	11.5	13.0	11.4
M-57*	11.3	10.7	12.0	13.7	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*	11.5	11.7	11.7	12.9	12.0
M-07	10.3	10.5	11.0	12.2	11.0
M-09	9.8	9.1	10.6	11.3	10.2
M-10	8.8	7.7	8.8	10.3	8.9
M-33	20.1	7.4	8.3	9.7	11.4
M-38	9.5	7.9	10.4	12.1	10.0
M-39	8.2	7.9	9.4	10.5	9.0

*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	10.1	10.3	11.0	12.5	11.0

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
344610003	MRUP	03/11/14	< 3.45	< 3.33	< 7.18	< 4.11	< 6.82	< 3.69	< 5.77	< 5.57	< 3.58	< 3.69	< 5.60	< 5.60
344610004	MRUP DUP	03/11/14	< 3.92	< 3.62	< 8.48	< 4.49	< 7.75	< 3.72	< 7.13	< 6.69	< 4.49	< 4.29	< 7.18	< 7.18
344610001	MRDOWN	03/11/14	< 3.14	< 3.31	< 6.81	< 4.60	< 6.80	< 3.56	< 5.89	< 5.82	< 3.72	< 3.57	< 4.85	< 4.85
344610002	MRDOWN DUP	03/11/14	< 3.66	< 3.44	< 7.39	< 4.18	< 7.87	< 4.04	< 5.78	< 5.58	< 4.02	< 3.56	< 5.63	< 5.63
351013005	MRUP	06/12/14	< 2.69	< 2.76	< 5.68	< 2.84	< 5.76	< 3.20	< 5.21	< 9.27	< 2.86	< 2.95	< 6.61	< 6.61
351013006	MRUP DUP	06/12/14	< 3.29	< 3.32	< 7.73	< 3.68	< 6.77	< 3.32	< 5.90	< 10.2	< 3.45	< 3.13	< 8.58	< 8.58
351013003	MRDOWN	06/12/14	< 2.46	< 2.63	< 6.04	< 2.95	< 5.22	< 2.57	< 4.85	< 8.76	< 2.83	< 2.63	< 6.92	< 6.92
351013004	MRDOWN DUP	06/12/14	< 2.59	< 3.01	< 6.06	< 2.8	< 5.24	< 3.00	< 5.35	< 10.2	< 2.78	< 2.96	< 7.85	< 7.85
356999002	MRUP	09/10/14	< 2.56	< 2.64	< 5.20	< 2.67	< 4.94	< 2.57	< 4.58	< 5.37	< 2.84	< 2.74	< 4.39	< 4.39
356999004	MRUP DUP	09/10/14	< 2.31	< 2.5	< 5.09	< 2.78	< 5.43	< 2.47	< 4.27	< 5.43	< 2.67	< 2.80	< 4.34	< 4.34
356999001	MRDOWN	09/10/14	< 2.20	< 2.70	< 5.19	< 3.04	< 5.60	< 2.75	< 4.48	< 5.47	< 2.86	< 2.65	< 4.82	< 4.82
356999003	MRDOWN DUP	09/10/14	< 2.32	< 2.63	< 4.83	< 3.01	< 5.55	< 2.68	< 4.97	< 5.70	< 2.94	< 2.73	< 4.70	< 4.70
362094003	MRDOWN	11/20/14	< 4.95	< 4.52	< 8.92	< 5.48	< 11.3	< 5.10	< 9.07	< 15.0	< 5.31	< 5.43	< 12.5	< 12.5
362094004	MRUP	11/21/14	< 4.45	< 4.58	< 9.46	< 5.47	< 10.4	< 5.29	< 11.0	< 13.7	< 5.26	< 5.50	< 11.0	< 11.0
362094001	MRDOWN *	11/20/14	< 4.01	< 4.00	< 8.01	< 3.78	< 8.18	< 4.38	< 6.86	< 11.2	< 4.49	< 3.55	< 9.11	< 9.11
362094002	MRDOWN DUP *	11/20/14	< 4.11	< 4.23	< 9.29	< 4.55	< 9.68	< 4.84	< 7.97	< 12.0	< 4.59	< 5.85	< 8.95	< 8.95

"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)			3000	
LAB ID	LOCATION	DATE	H-3	
341487001	Outfall 007	01/14/14	< 350	
343003001	Outfall 007	02/06/14	1492	+/-374
344618001	Outfall 007	03/07/14	< 430	
344608001	Outfall 007	03/10/14	< 433	
344610003	MRUP	03/11/14	< 431	
344610004	MRUP DUP	03/11/14	< 433	
344610001	MRDOWN	03/11/14	< 439	
344610002	MRDOWN DUP	03/11/14	< 438	
346231001	Outfall 007	04/03/14	< 484	
348187001	Outfall 007	05/01/14	< 461	
350286001	Outfall 007	06/05/14	< 434	
351013005	MRUP	06/12/14	< 488	
351013006	MRUP DUP	06/12/14	< 486	
351013003	MRDOWN	06/12/14	< 493	
351013004	MRDOWN DUP	06/12/14	< 487	
352091001	Outfall 007	07/03/14	< 362	
354271001	Outfall 007	08/04/14	< 389	
356092001	Outfall 007	09/03/14	< 562	
356999002	MRUP	09/10/14	< 534	
356999004	MRUP DUP	09/10/14	< 527	
356999001	MRDOWN	09/10/14	< 538	
356999003	MRDOWN DUP	09/10/14	< 533	
358411001	Outfall 007	09/30/14	< 346	
360251001	Outfall 007	10/29/14	< 545	
362094003	MRDOWN	11/20/14	< 217	
362094004	MRUP	11/21/14	< 218	
362094001	MRDOWN *	11/20/14	< 218	
362094002	MRDOWN DUP *	11/20/14	< 216	
362064001	Outfall 007	11/24/14	< 218	
363680001	Outfall 007	12/22/14	< 375	

* 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
362696001	PGWELL	12/08/14	< 3.33	< 3.47	< 6.84	< 3.33	< 6.53	< 3.34	< 5.57	< 3.68	< 3.23	< 7.18	< 7.18
362696003	CONSTWELL 3	12/08/14	< 4.20	< 4.62	< 7.69	< 3.60	< 7.15	< 4.73	< 7.33	< 4.44	< 4.12	< 7.29	< 7.29
362696005	CONSTWELL 4	12/08/14	< 3.47	< 3.40	< 7.09	< 3.99	< 7.19	< 3.47	< 6.22	< 3.44	< 3.28	< 6.86	< 6.86

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	
362696001	PGWELL	12/08/14	< 528	362696001
362696002	PGWELL GG DUP	12/08/14	< 565	362696002
362696003	CONSTWELL 3	12/08/14	< 566	362696003
362696004	CONSTWELL 3 GG DUP	12/08/14	< 549	362696004
362696005	CONSTWELL 4	12/08/14	< 557	362696005
362696006	CONSTWELL 4 GG DUP	12/08/14	< 562	362696006

"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
362696001	PGWELL	12/08/14	< 0.576
362696003	CONSTWELL 3	12/08/14	< 0.559
362696005	CONSTWELL 4	12/08/14	< 0.811

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
357217002	SEDCONT	9/10/2014	< 43	< 31.4
357217001	SEDHAM	9/10/2014	< 38.5	39.39

"DUP" – indicates duplicate sample.

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

LLD (pCi/kg) LAB ID	LOCATION	DATE	130 MN-54	130 CO-58	260 FE-59	130 CO-60	260 ZN-65	130 CS-134	150 CS-137
356996001	FISHUP	09/10/14	< 11.0	< 11.5	< 33.5	< 13.7	< 26.1	< 11.3	< 10.9
356996003	FISHUP GG DUP	09/10/14	< 6.12	< 6.85	< 20.6	< 8.72	< 17.8	< 7.01	< 7.85
356996002	FISHDOWN	09/10/14	< 8.99	< 9.12	< 22.5	< 9.94	< 22.1	< 10.9	< 10.4
356996004	FISHDOWN GG DUP	09/10/14	< 6.91	< 8.35	< 17.8	< 7.94	< 19.5	< 8.20	< 7.07

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
345719001	VEG-CONT	03/26/14	< 18.1	< 9.63	< 8.91
345719002	VEG-J	03/27/14	< 22.7	< 15.8	< 13.9
351418001	VEG-CONT	06/18/14	< 11.1	< 5.98	< 5.75
351418003	VEG-CONT GG DUP	06/18/14	< 18.8	< 9.04	< 7.15
351418002	VEG-J	06/19/14	< 17.4	< 10.3	< 10.3
351418004	VEG-J GG DUP	06/19/14	< 20.9	< 12.1	< 11.7
356447001	VEG-CONT	09/08/14	< 8.79	< 7.30	< 7.30
356447002	VEG-J	09/08/14	< 9.95	< 8.40	< 7.41

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

SPECIAL DEER MEAT SAMPLES (GAMMA)

LLD LAB ID	LOCATION	DATE	15 MN-54	15 CO-58	30 FE-59	15 CO-60	30 ZN-65	15 CS-134	18 CS-137
359956001	DEER	10/24/14	< 7.82	< 9.33	< 17.3	< 9.35	< 14.3	< 7.5	< 10

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

STANFORD DOSIMETRY

ENVIRONMENTAL DOSIMETRY COMPANY

ANNUAL QUALITY ASSURANCE STATUS REPORT

January - December 2014

Prepared By: _____ Date: 3/18/15

Approved By: _____ Date: 3/18/15

Environmental Dosimetry Company
10 Ashton Lane
Sterling, MA 01564

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EXECUTIVE SUMMARY

Routine quality control (QC) testing was performed for dosimeters issued by the Environmental Dosimetry Company (EDC) .

During this annual period, 100% (72/72) of the individual dosimeters, evaluated against the EDC internal performance acceptance criteria (high-energy photons only), met the criterion for accuracy and 100% (72/72) met the criterion for precision (Table 1). In addition, 100% (12/12) of the dosimeter sets evaluated against the internal tolerance limits met EDC acceptance criteria (Table 2) and 100% (6/6) of independent testing passed the performance criteria (Table 3). Trending graphs, which evaluate performance statistic for high-energy photon irradiations and co-located stations are given in Appendix A.

Two assessments were performed in 2014, one internal and one external. There were no findings.

I. INTRODUCTION

The TLD systems at the Environmental Dosimetry Company (EDC) are calibrated and operated to ensure consistent and accurate evaluation of TLDs. The quality of the dosimetric results reported to EDC clients is ensured by in-house performance testing and independent performance testing by EDC clients, and both internal and client directed program assessments.

The purpose of the dosimetry quality assurance program is to provide performance documentation of the routine processing of EDC dosimeters. Performance testing provides a statistical measure of the bias and precision of dosimetry processing against a reliable standard, which in turn points out any trends or performance changes. Two programs are used:

A. QC Program

Dosimetry quality control tests are performed on EDC Panasonic 814 Environmental dosimeters. These tests include: (1) the in-house testing program coordinated by the EDC QA Officer and (2) independent test perform by EDC clients. In-house test are performed using six pairs of 814 dosimeters, a pair is reported as an individual result and six pairs are reported as the mean result. Results of these tests are described in this report.

Excluded from this report are instrumentation checks. Although instrumentation checks represent an important aspect of the quality assurance program, they are not included as process checks in this report. Instrumentation checks represent between 5-10% of the TLDs processed.

B. QA Program

An internal assessment of dosimetry activities is conducted annually by the Quality Assurance Officer (Reference 1). The purpose of the assessment is to review procedures, results, materials or components to identify opportunities to improve or enhance processes and/or services.

II. PERFORMANCE EVALUATION CRITERIA

A. Acceptance Criteria for Internal Evaluations

1. Bias

For each dosimeter tested, the measure of bias is the percent deviation of the reported result relative to the delivered exposure. The percent deviation relative to the delivered exposure is calculated as follows:

$$\frac{H_i' - H_i}{H_i} 100$$

where:

H_i' = the corresponding reported exposure for the i^{th} dosimeter (i.e., the reported exposure)

H_i = the exposure delivered to the i^{th} irradiated dosimeter (i.e., the delivered exposure)

2. Mean Bias

For each group of test dosimeters, the mean bias is the average percent deviation of the reported result relative to the delivered exposure. The mean percent deviation relative to the delivered exposure is calculated as follows:

$$\sum\left(\frac{H_i' - H_i}{H_i}\right)100\left(\frac{1}{n}\right)$$

where:

H_i' = the corresponding reported exposure for the i^{th} dosimeter (i.e., the reported exposure)

H_i = the exposure delivered to the i^{th} irradiated test dosimeter (i.e., the delivered exposure)

n = the number of dosimeters in the test group

3. Precision

For a group of test dosimeters irradiated to a given exposure, the measure of precision is the percent deviation of individual results relative to the mean reported exposure. At least two values are required for the determination of precision. The measure of precision for the i^{th} dosimeter is:

$$\left(\frac{H_i' - \bar{H}}{\bar{H}}\right)100$$

where:

H_i' = the reported exposure for the i^{th} dosimeter (i.e., the reported exposure)

$\bar{H}$ = the mean reported exposure; i.e., $\bar{H} = \sum H_i'\left(\frac{1}{n}\right)$

n = the number of dosimeters in the test group

4. EDC Internal Tolerance Limits

All evaluation criteria are taken from the "EDC Quality System Manual," (Reference 2). These criteria are only applied to individual test dosimeters irradiated with high-energy photons (Cs-137) and are as follows for Panasonic Environmental dosimeters: ± 15% for bias and ± 12.8% for precision.

B. QC Investigation Criteria and Result Reporting

EDC Quality System Manual (Reference 2) specifies when an investigation is required due to a QC analysis that has failed the EDC bias criteria. The criteria are as follows:

1. No investigation is necessary when an individual QC result falls outside the QC performance criteria for accuracy.

2. Investigations are initiated when the mean of a QC processing batch is outside the performance criterion for bias.

C. Reporting of Environmental Dosimetry Results to EDC Customers

1. All results are to be reported in a timely fashion.

2. If the QA Officer determines that an investigation is required for a process, the results shall be issued as normal. If the QC results, prompting the investigation, have a mean bias from the known of greater than ±20%, the results shall be issued with a note indicating that they may be updated in the future, pending resolution of a QA issue.

3. Environmental dosimetry results do not require updating if the investigation has shown that the mean bias between the original results and the corrected results, based on applicable correction factors from the investigation, does not exceed ±20%.

III. DATA SUMMARY FOR ISSUANCE PERIOD JANUARY-DECEMBER 2014

A. General Discussion

Results of performance tests conducted are summarized and discussed in the following sections. Summaries of the performance tests for the reporting period are given in Tables 1 through 3 and Figures 1 through 4.

Table 1 provides a summary of individual dosimeter results evaluated against the EDC internal acceptance criteria for high-energy photons only. During this period, 100% (72/72) of the individual dosimeters, evaluated against these criteria met the tolerance limits for accuracy and 100% (72/72) met the criterion for precision. A graphical interpretation is provided in Figures 1 and 2.

Table 2 provides the Bias + Standard deviation results for each group (N=6) of dosimeters evaluated against the internal tolerance criteria. Overall,100% (12/12) of the dosimeter sets evaluated against the internal tolerance performance criteria met these criteria. A graphical interpretation is provided in Figures 3

Table 3 presents the independent blind spike results for dosimeters processed during this annual period. All results passed the performance acceptance criterion. Figure 4 is a graphical interpretation of Seabrook Station blind co-located station results.

B. Result Trending

One of the main benefits of performing quality control tests on a routine basis is to identify trends or performance changes. The results of the Panasonic environmental dosimeter performance tests are presented in Appendix A. The results are evaluated against each of the performance criteria listed in Section II, namely: individual dosimeter accuracy, individual dosimeter precision, and mean bias.

All of the results presented in Appendix A are plotted sequentially by processing date.

IV. STATUS OF EDC CONDITION REPORTS (CR)

No condition reports were issued during this annual period.

V. STATUS OF AUDITS/ASSESSMENTS

A. Internal

EDC Internal Quality Assurance Assessment was conducted during the fourth quarter 2014. There were no findings identified.

B. External

The FPL/NextEra Energy Nuclear Oversight Audit SBK-14-019 was conducted on September 24, 2014. There were no findings identified.

VI. PROCEDURES AND MANUALS REVISED DURING JANUARY - DECEMBER 2014

No procedures or manuals were revised in 2014.

VII. CONCLUSION AND RECOMMENDATIONS

The quality control evaluations continue to indicate the dosimetry processing programs at the EDC satisfy the criteria specified in the Quality System Manual. The EDC demonstrated the ability to meet all applicable acceptance criteria.

VIII. REFERENCES

1. EDC Quality Control and Audit Assessment Schedule, 2014.

2. EDC Manual 1, Quality System Manual, Rev. 3, August 1, 2012.

TABLE 1

PERCENTAGE OF INDIVIDUAL DOSIMETERS THAT PASSED EDC INTERNAL CRITERIA JANUARY – DECEMBER 2014[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 2014[1], [2]

Process Date	Mean Bias %	Standard Deviation %	Tolerance Limit +/-15%
4/19/2014	2.7	1.6	Pass
4/22/2014	-0.1	0.9	Pass
4/30/2014	0.1	1.9	Pass
7/22/2014	1.7	1.5	Pass
7/25/2014	2.8	1.2	Pass
8/04/2014	-3.6	1.0	Pass
9/24/2014	2.5	0.6	Pass
10/21/2014	0.7	0.5	Pass
10/28/2014	3.9	1.5	Pass
1/25/2015	4.1	1.1	Pass
1/28/2015	2.1	1.6	Pass
3/11/2015	-8.2	1.0	Pass

[1]This table summarizes results of tests conducted by EDC for TLDs issued in 2014.
[2]Environmental dosimeter results are free in air.

TABLE 3
SUMMARY OF INDEPENDENT DOSIMETER TESTING JANUARY – DECEMBER 2014[1], [2]

Issuance Period	Client	Mean Bias %	Standard Deviation %	Pass / Fail
1st Qtr. 2014	Millstone	2.8	3.2	Pass
2nd Qtr.2014	Millstone	-6.0	4.5	Pass
2nd Qtr.2014	Seabrook	0.3	1.6	Pass
3rd Qtr. 2014	Millstone	-10.2	3.6	Pass
4th Qtr.2014	Millstone	-6.5	2.9	Pass
4th Qtr.2014	Seabrook	5.5	1.7	Pass

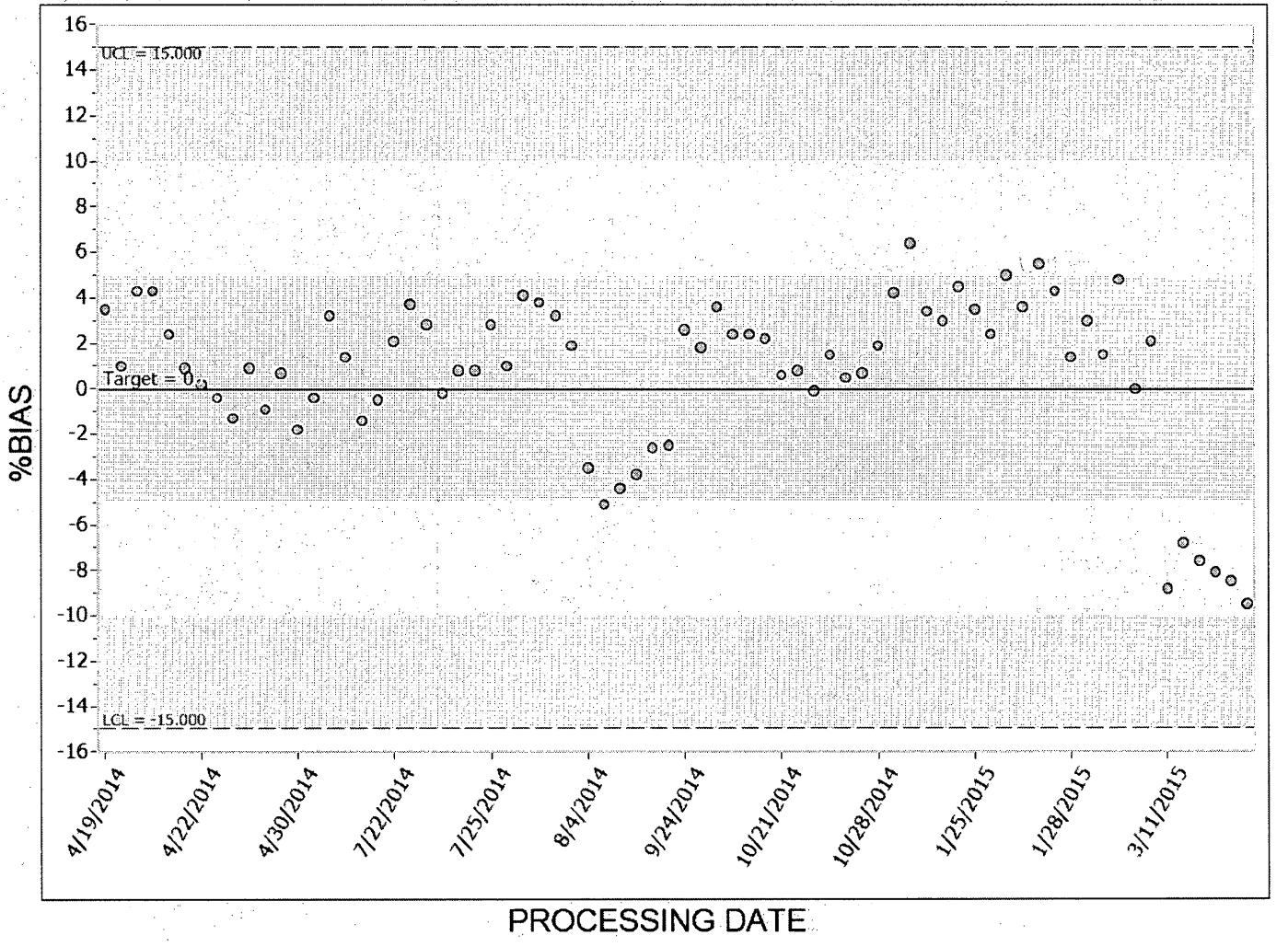
[1]Performance criteria are +/- 30%.
[2]Blind spike irradiations using Cs-137

APPENDIX A

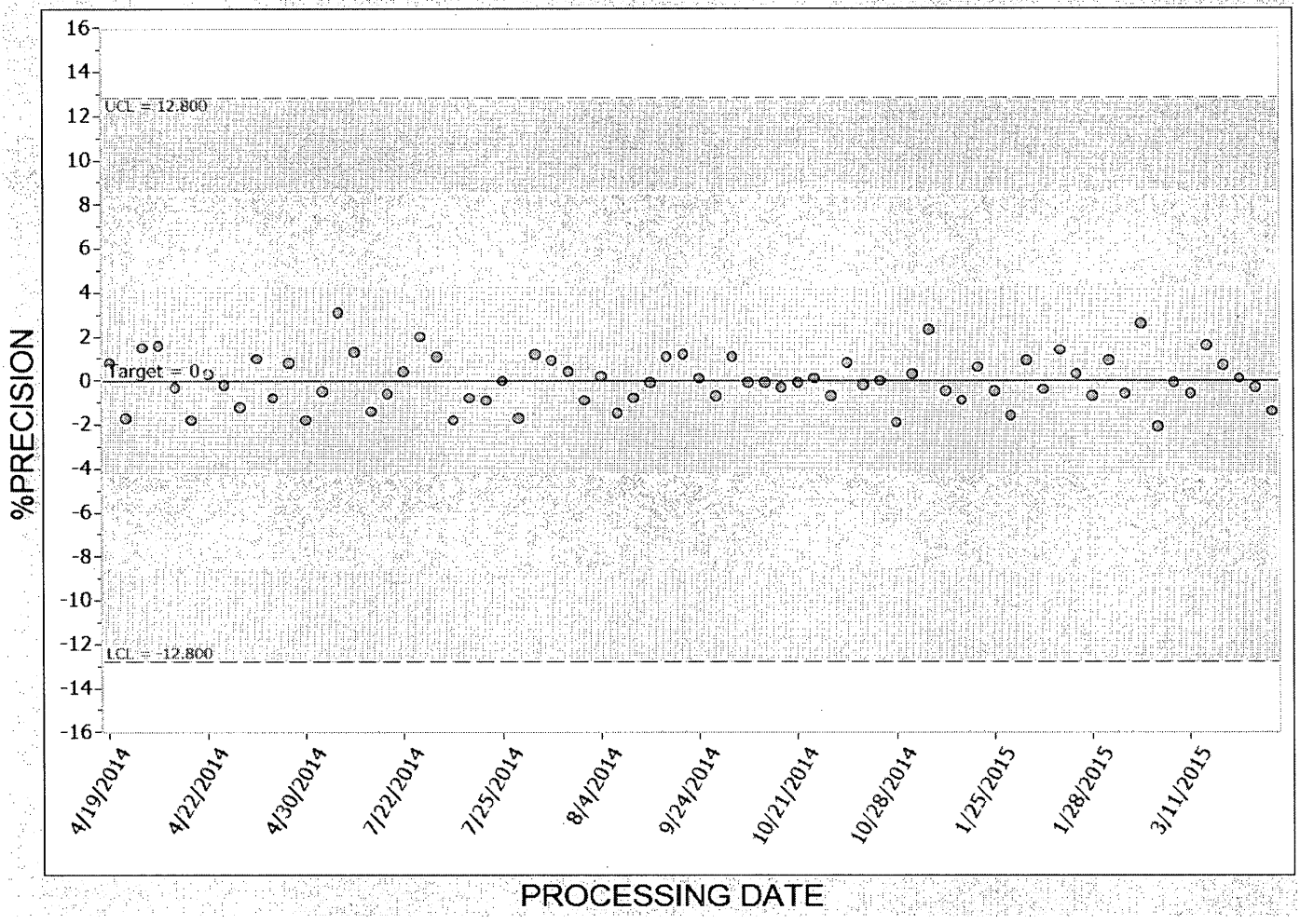
DOSIMETRY QUALITY CONTROL TRENDING GRAPHS

ISSUE PERIOD JANAURY - DECEMBER 2014

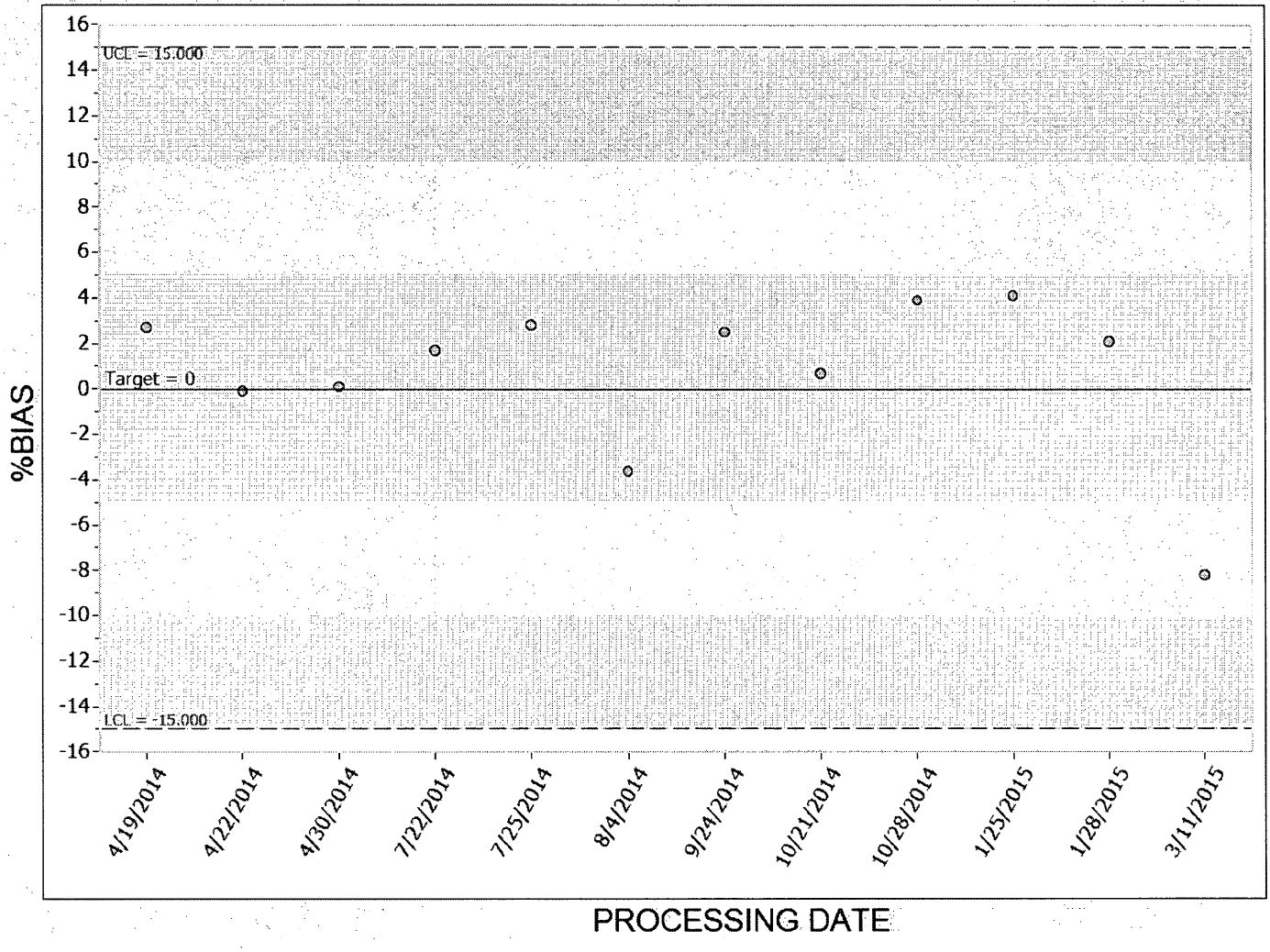
INDIVIDUAL ACCURACY ENVIRONMENTAL
FIGURE 1



INDIVIDUAL PRECISION ENVIRONMENTAL
FIGURE 2



MEAN ACCURACY ENVIRONMENTAL
FIGURE 3



SEABROOK CO-LOCATE ACCURACY
FIGURE 4

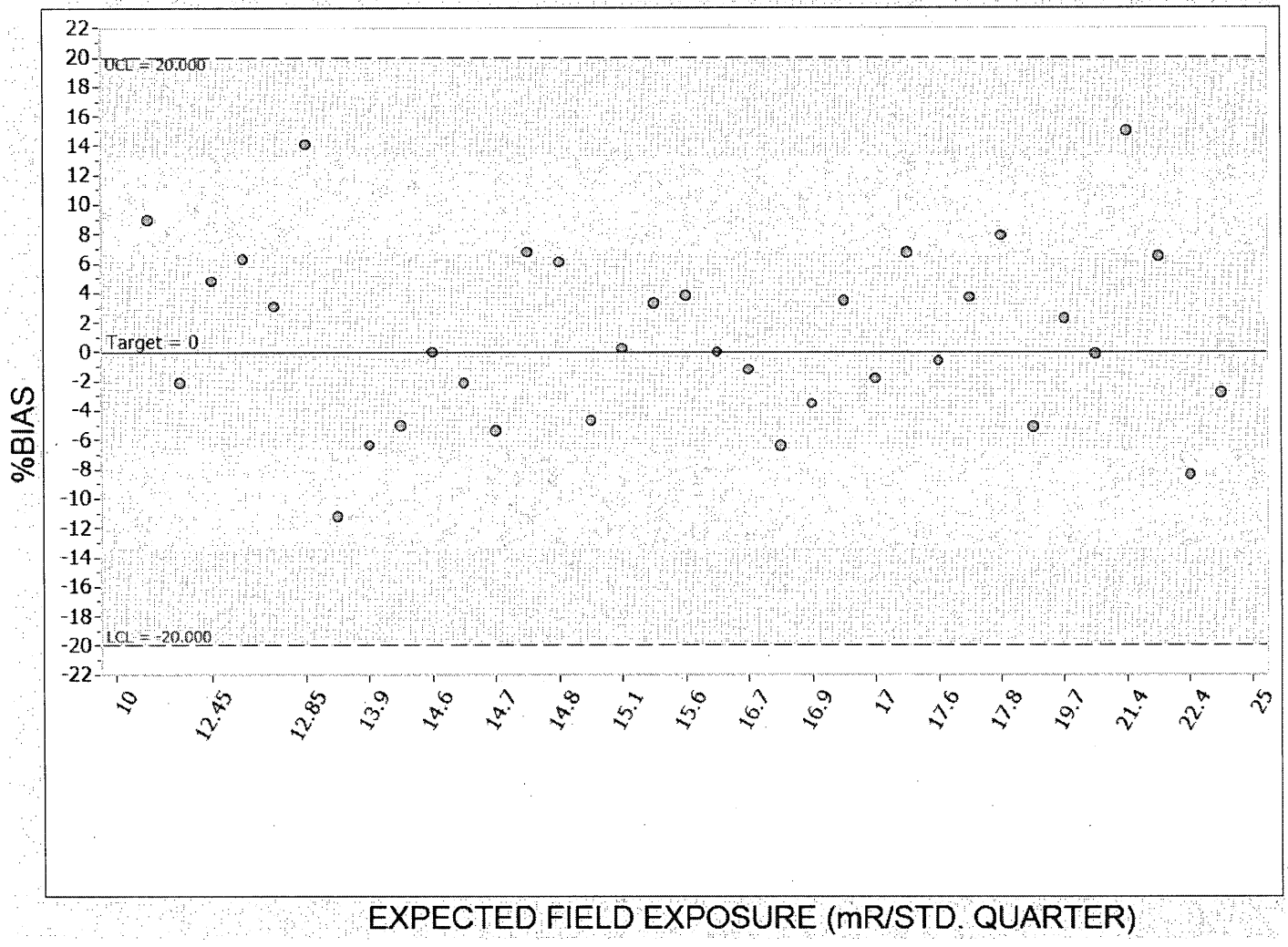


Table A.9.2
Sample Type: Quality Assurance Report
Matrix: Milk, Soil, Liquid, Vegetation, Air Charcoal, Air Particulate, Water

GEL LABORATORIES LLC

GEL | Laboratories LLC

2014 ANNUAL QUALITY ASSURANCE REPORT

FOR THE

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM (REMP)

GEL LABORATORIES, LLC
P.O. Box 30712, Charleston, SC 29417
843.556.8171

2014 ANNUAL QUALITY ASSURANCE REPORT

FOR THE

RADIOLOGICAL ENVIRONMENTAL

MONITORING PROGRAM (REMP)

Approved By: _____ February 15, 2015 Rev. 1
Robert L. Pullano Date
Director, Quality Systems

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2014 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 2014. 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 2014.
- Inter-laboratory QC results analyzed during 2014 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 July, 2014. One (1) finding, four (4) observations, and eight (8) recommendations resulted from this assessment. By September, 2014, the 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 2014. Of the four hundred forty-five (445) total results reported, 98.6% (439 of 445) 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 sixty-nine (69) 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 30 and 31 were analyzed by the laboratory. Of the one hundred thirty-eight (138) analyses, 97.8% (135 out of 138) of all results fell within the PT provider's acceptance criteria. Three analytical failures occurred: Uranium-234/233 and Uranium-238 in Soil and Uranium-238 in vegetation.

For the corrective actions associated with MAPEP Series 30, refer to CARR 140605-879 which is detailed in Table 8.

10. Summary of Participation in the ERA MRaD PT Program

The ERA MRad program provided samples (MRAD-20 and MRAD-21) for one hundred eighty-eight (188) individual environmental analyses. One hundred eighty-seven (187) of the 188 analyses fell within the PT provider's acceptance criteria (99.4%). One analytical failure occurred: Americium-241 in water.

For the corrective actions associated with MRAD-20, refer to CARR140520-874 which are detailed in Table 8.

11. Summary of Participation in the ERA PT Program

The ERA program provided samples (RAD-96, RAD-98, and 011014L) for fifty (50) individual environmental analyses. Of the 50 analyses, 96.0% (48 out of 50) of all results fell within the PT provider's acceptance criteria. One isotope failure occurred: Strontium-89 in water.

For the corrective actions associated with RAD-98 refer to corrective actions CARR140825-902 (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 2014. **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

2014 RADIOLOGICAL PROFICIENCY TESTING RESULTS AND ACCEPTANCE CRITERIA

PT Provider	Quarter / Year	Report Received Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Barium-133	80.6	76.2	63.8-83.8	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Cesium-134	64.7	66.8	54.4-73.5	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Cesium-137	112.0	109	98.1-122	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Cobalt-60	95.0	88.7	79.8-99.9	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Zinc-65	200	185	166-218	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Gross Alpha	34.8	36.1	18.6-46.4	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Gross Beta	19.6	22.3	13.5-30.4	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Gross Alpha	34.6	36.1	18.6-46.4	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Radium-226	16.2	16.8	12.5-19.2	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Radium-228	4.62	5.04	3.01-6.67	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Uranium (Nat)	7.39	7.23	5.51-8.53	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	ug/L	Uranium (Nat) mass	11.00	10.6	8.07-12.5	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Radium-226	15.10	16.8	12.5-19.2	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Radium-228	4.66	5.04	3.01-6.67	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Uranium (Nat)	7.47	7.23	5.51-8.53	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	ug/L	Uranium (Nat) mass	11.4	10.6	8.07-12.5	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Tritium	3320	3580	3030-3950	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Strontium-89	44.1	44.4	34.4-51.6	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Strontium-90	34.2	30.3	22.1-35.2	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Strontium-89	38.9	44.4	34.4-51.6	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Strontium-90	27.1	30.3	22.1-35.2	Acceptable
ERA	1st / 2014	02/06/14	011014L	Water	pCi/L	Strontium-89	42.3	38.7	29.3-45.7	Acceptable
ERA	1st / 2014	02/06/14	011014L	Water	pCi/L	Strontium-89	42.2	38.7	29.3-45.7	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Iodine-131	25.2	24.4	20.2-28.9	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Iodine-131	22.4	24.4	20.2-28.9	Acceptable
EZA	1st/2014	05/16/14	E10846	Cartridge	pCi	Iodine-131	7.83E+01	7.50E+03	1.04	Acceptable
EZA	1st/2014	05/16/14	E10847	Milk	pCi/L	Strontium-89	9.14E+01	9.17E+01	1	Acceptable
EZA	1st/2014	05/16/14	E10847	Milk	pCi/L	Strontium-90	1.27E+01	1.51E+01	0.84	Acceptable

PT Provider	Quarter / Year	Report Received Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
EZA	1st/2014	05/16/14	E10848	Milk	pCi/L	Iodine-131	9.84E+01	9.85E+01	1	Acceptable
EZA	1st/2014	05/16/14	E10848	Milk	pCi/L	Cerium-141	1.21E+02	1.19E+02	1.02	Acceptable
EZA	1st/2014	05/16/14	E10848	Milk	pCi/L	Cr-51	5.19E+02	4.91E+02	1.06	Acceptable
EZA	1st/2014	05/16/14	E10848	Milk	pCi/L	Cesium-134	1.79E+02	2.10E+02	0.85	Acceptable
EZA	1st/2014	05/16/14	E10848	Milk	pCi/L	Cesium-137	2.55E+02	2.53E+02	1.01	Acceptable
EZA	1st/2014	05/16/14	E10848	Milk	pCi/L	Cobalt-58	2.58E+02	2.68E+02	0.96	Acceptable
EZA	1st/2014	05/16/14	E10848	Milk	pCi/L	Mn-54	3.01E+02	2.97E+02	1.01	Acceptable
EZA	1st/2014	05/16/14	E10848	Milk	pCi/L	Iron-59	2.24E+02	2.19E+02	1.02	Acceptable
EZA	1st/2014	05/16/14	E10848	Milk	pCi/L	Zinc-65	3.45E+02	3.23E+02	1.07	Acceptable
EZA	1st/2014	05/16/14	E10848	Milk	pCi/L	Cobalt-60	3.39E+02	3.37E+02	1.00	Acceptable
EZA	1st/2014	05/16/14	E10849	Water	pCi/L	Iodine-131	9.24E+01	8.99E+01	1.03	Acceptable
EZA	1st/2014	05/16/14	E10849	Water	pCi/L	Cerium-141	8.19E+01	7.71E+01	1.06	Acceptable
EZA	1st/2014	05/16/14	E10849	Water	pCi/L	Cr-51	3.32E+02	3.19E+02	1.04	Acceptable
EZA	1st/2014	05/16/14	E10849	Water	pCi/L	Cesium-134	1.27E+02	1.36E+02	0.93	Acceptable
EZA	1st/2014	05/16/14	E10849	Water	pCi/L	Cesium-137	1.69E+02	1.64E+02	1.03	Acceptable
EZA	1st/2014	05/16/14	E10849	Water	pCi/L	Cobalt-58	1.75E+02	1.74E+02	1.01	Acceptable
EZA	1st/2014	05/16/14	E10849	Water	pCi/L	Mn-54	2.08E+02	1.93E+02	1.08	Acceptable
EZA	1st/2014	05/16/14	E10849	Water	pCi/L	Iron-59	1.68E+02	1.42E+02	1.18	Acceptable
EZA	1st/2014	05/16/14	E10849	Water	pCi/L	Zinc-65	2.25E+02	2.10E+02	1.07	Acceptable
EZA	1st/2014	05/16/14	E10849	Water	pCi/L	Cobalt-60	2.31E+02	2.19E+02	1.02	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-GrF30	Filter	Bq/sample	Gross Alpha	1.980	1.77	0.53-3.01	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-GrF30	Filter	Bq/sample	Gross Beta	0.823	0.77	0.39-1.16	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Americium-241	65	68	47.6-88.4	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Cesium-134	5.44	0	False Pos Test	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Cesium-137	1270	1238	867-1609	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Cobalt-57	947	966	676-1256	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Cobalt-60	0.581	1.220	Sens. Eval.	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Iron-55	580	643	444-824	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Manganese-54	1470	1430	1001-1859	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Nickel-63	6.95	0	False Pos Test	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Plutonium-238	89.7	96.0	67-125	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Plutonium-239/240	69.80	76.8	53.8-99.8	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Potassium-40	703	622	435-809	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-	Soil	Bq/kg	Strontium-90	1.48	0	False Pos Test	Acceptable

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			MaS30							
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Technetium-99	37.1	0	False Pos Test	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	U-234/233	30.5	81.0	57-105	Not Accept.
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Uranium-238	35	83	58-108	Not Accept.
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Zinc-65	766	695	487-904	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Americium-241	0.759	0.720	0.504-0.936	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Cesium-134	21.4	23.1	16.2-30.0	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Cesium-137	29.70	28.9	20.2-37.6	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Cobalt-57	28.0	27.5	19.3-35.8	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Cobalt-60	16.6	16.0	11.2-20.8	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Hydrogen-3	308	321	225-417	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Iron-55	0.3	0.0	False Pos Test	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Manganese-54	14.4	13.9	9.7-18.1	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Nickel-63	31.4	34.0	23.8-44.2	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Plutonium-238	0.764	0.828	0.580-1.076	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Pu-239/240	0.6590	0.6760	0.473-0.879	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Potassium-40	0.460	0	False Pos Test	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Strontium-90	8.32	8.51	5.96-11.06	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Technetium-99	9.5	10.3	7.2-13.4	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	U-234/233	0.210	0.225	0.158-0.293	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Uranium-238	1.41	1.45	1.02-1.89	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-	Water	Bq/L	Zinc-65	-0.126	0.0	False Pos Test	Acceptable

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			MaW30							
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Gross Alpha	0.96	0.85	0.255-1.443	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Gross Beta	4.7	4.2	2.10-6.29	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Iodine-129	0.0227	0.00	False Pos Test	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	ug/sample	Uranium-235	0.018	0.020	0.014-0.026	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	ug/sample	Uranium-238	8.77	10.4	7.3-13.5	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	ug/sample	Uranium-Total	8.80	10.4	7.3-13.5	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	ug/sample	Americium-241	0.086	0.090	0.063-0.117	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/sample	Cesium-134	1.85	1.91	1.34-2.48	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/sample	Cesium-137	1.81	1.76	1.23-2.29	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/sample	Cobalt-57	0.0757	0.00	False Pos Test	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/sample	Cobalt-60	1.490	1.39	0.97-1.81	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/sample	Manganese-54	0.0138	0.00	False Pos Test	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/sample	Plutonium-238	0.000819	0.00090	Sens. Eval.	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/sample	Pu-239/240	0.071	0.7720	0.054-0.1004	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/sample	Strontium-90	1.19	1.18	0.83-1.53	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/sample	U-234/233	0.0159	0.0195	0.0137-0.0254	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/sample	Uranium-238	0.118	0.129	0.090-0.168	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/sample	Zinc-65	0.246	0.00	False Pos Test	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/sample	Gross Alpha	0.656	1.20	0.36-2.04	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/sample	Gross Beta	0.95	0.85	0.43-1.28	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-	Filter	Bq/sample	Americium-241	0.106	0.104	0.073-0.135	Acceptable

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			RdF30							
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	ug/sample	Uranium-235	0.261	0.0268	0.0188-0.0348	Not Accept.
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	ug/sample	Uranium-238	12.7	13.3	9.3-17.3	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	ug/sample	Uranium-Total	12.7	13.3	9.3-17.3	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	ug/sample	Americium-241	0.1100	0.108	0.076-0.140	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	Bq/sample	Cesium-134	5.65	6.04	4.23-7.85	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	Bq/sample	Cesium-137	4.98	4.74	3.32-6.16	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	Bq/sample	Cobalt-57	11.1	10.1	7.1-13.1	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	Bq/sample	Cobalt-60	7.21	6.93	4.85-9.01	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	Bq/sample	Manganese-54	9.24	8.62	6.03-11.21	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	Bq/sample	Plutonium-238	0.116	0.121	0.085-0.157	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	Bq/sample	Pu-239/240	0.134	0.154	0.108-0.0200	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	Bq/sample	Strontium-90	1.580	1.46	1.02-1.90	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	Bq/sample	U-234/233	0.2640	0.2530	0.0177-0.0329	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	Bq/sample	Uranium-238	0.174	0.165	0.116-0.215	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	Bq/sample	Zinc-65	8.87	7.00	4.38-8.13	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Actinium-228	1140	1240	795-1720	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Americium-241	418	399	233-518	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Bismuth-212	976	1240	330-1820	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Bismuth-214	2290	1960	1180-2820	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Cesium-134	3080	3390	2220-4070	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Cesium-137	8310	8490	6510-10900	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Cobalt-60	6570	6830	4620-9400	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Lead-212	1330	1240	812-1730	Acceptable
ERA	2nd/2014	05/16/14	MRAD-	Soil	pCi/kg	Lead-214	2800	2070	1210-3090	Acceptable

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			20							
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Manganese-54	<44.3	<1000	0-1000	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Plutonium-238	579	578	348-797	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Plutonium-239	488	471.00	308-651	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Potassium-40	10500	10500	7660-14100	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Strontium-90	2500	2780	1060-4390	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Thorium-234	3420	3360	1060-6320	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Zinc-65	5700	5400	4300-7180	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Strontium-90	6730	8530	3250-13500	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Uranium-234	2602	3390	2070-4350	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Uranium-238	2425	3360	2080-4260	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Uranium-Total	5027	6910	3750-9120	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	ug/kg	Uranium-Total(mass)	7110	10100	5570-12700	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Uranium-234	3440	3390	2070-4350	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Uranium-238	3680	3360	2080-4260	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Uranium-Total	7310	6910	3750-9120	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	ug/kg	Uranium-Total(mass)	11000	10100	5570-12700	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Uranium-234	3740	3390	2070-4350	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Uranium-238	3780	3360	2080-4260	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Uranium-Total	7683	6910	3750-9120	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	ug/kg	Uranium-Total(mass)	11300	10100	5570-12700	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	ug/kg	Uranium-Total(mass)	11200	10100	5570-12700	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Americium-241	1670	1490	911-1980	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Cesium-134	657	646	415-839	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Cesium-137	861	880	638-1220	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Cobalt-60	997	926	639-1290	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Curium-244	514	516	253-804	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Manganese-54	<62.2	<300	0.00-300	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Plutonium-238	2230	2110	1260-2890	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Plutonium-239	3810	3740	2300-5150	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Potassium-40	30800	31900	23000-44800	Acceptable
ERA	2nd/2014	05/16/14	MRAD-	Vegetation	pCi/kg	Strontium-	2330	2580	1470-3420	Acceptable

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			20			90				
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Uranium-234	1920	1760	1160-2260	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Uranium-238	1970	1750	1170-2220	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Uranium-Total	4025	3580	2430-4460	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	ug/kg	Uranium-Total(mass)	5920	5240	3510-6650	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Zinc-65	1030	919	663-1290	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Uranium-234	1730	1760	1160-2260	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Uranium-238	2000	1750	1170-2220	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Uranium-Total	3817	3580	2430-4460	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	ug/kg	Uranium-Total(mass)	5990	5240	3510-6650	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	ug/kg	Uranium-Total(mass)	5620	5240	3510-6650	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Americium-241	60.2	59.7	36.8-80.8	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Cesium-134	920	1010	643-1250	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Cesium-137	816	828	622-1090	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Cobalt-60	1130	1120	867-1400	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Iron-55	254	240	74.4-469	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Manganese-54	<6.64	<50.0	0-50.0	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Plutonium-238	51.3	56.3	38.6-74.0	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Plutonium-239	47.5	48.6	35.2-63.5	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Strontium-90	76.7	78.9	38.6-118	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Uranium-234	33.8	36.4	22.6-54	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Uranium-238	34.5	36.1	23.3-49.9	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Uranium-Total	70.3	74.3	41.1-113	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	ug/Filter	Uranium-Total(mass)	104	108	69.1-152	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Zinc-65	737	667	478-921	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Uranium-234	35.5	36.4	22.6-54	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Uranium-238	35.3	36.1	23.3-49.9	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Uranium-Total	72.4	74.3	41.1-113	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	ug/Filter	Uranium-Total(mass)	105	108	69.1-152	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	ug/Filter	Uranium-Total(mass)	100	108	69.1-152	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Gross Alpha	60.9	46	15.4-71.4	Acceptable
ERA	2nd/2014	05/16/14	MRAD-	Filter	pCi/Filter	Gross Beta	58.9	53.8	34.0-78.4	Acceptable

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			20							
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Americium-241	186	114	76.8-153	Not Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Cesium-134	1540	1660	1220-1910	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Cesium-137	2760	2690	2280-3220	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Cobalt-60	1320	1270	1100-1490	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Iron-55	1230	1200	716-1630	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Manganese-54	<7.54	<100	0.00-100	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Plutonium-238	37	44	32.6-54.9	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Plutonium-239	124	160	124-202	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Strontium-90	95	890	580-1180	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-234	77.8	82.4	61.9-106	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-238	50.8	48.4	36.9-59.4	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-Total	156	168	123-217	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	ug/L	Uranium-Total(mass)	233	245	195-296	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Zinc-65	2030	1800	1500-2270	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-234	82.1	82.4	61.9-106	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-238	84.6	48.4	36.9-59.4	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-Total	170	168	123-217	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	ug/L	Uranium-Total(mass)	253	245	195-296	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-234	80.5	82.4	61.9-106	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-238	90.0	48.4	36.9-59.4	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-Total	175	168	123-217	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	ug/L	Uranium-Total(mass)	269	245	195-296	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-234	77.8	82.4	61.9-106	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-238	78.3	48.4	36.9-59.4	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-Total	156	168	123-217	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	ug/L	Uranium-Total(mass)	233	245	195-296	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	ug/L	Uranium-Total(mass)	232	245	195-296	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Gross Alpha	141.0	133	47.2-206	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Gross Beta	172	174.0	99.6-258	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Tritium	5280	5580	3740-7960	Acceptable
EZA	2nd/2014	08/08/14	E10897	Cartridge	pCi	Iodine-131	8.73E+01	8.54E+01	1.02	Acceptable

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EZA	2nd/2014	08/08/14	E10898	Milk	pCi/L	Strontium-89	9.84E+01	9.13E+01	1.08	Acceptable
EZA	2nd/2014	08/08/14	E10898	Milk	pCi/L	Strontium-90	1.44E+01	1.45E+01	0.99	Acceptable
EZA	2nd/2014	08/08/14	E10899	Milk	pCi/L	Iodine-131	9.89E+01	9.09E+01	1.09	Acceptable
EZA	2nd/2014	08/08/14	E10899	Milk	pCi/L	Cerium-141	1.38E+02	1.24E+02	1.12	Acceptable
EZA	2nd/2014	08/08/14	E10899	Milk	pCi/L	Chromium-51	2.68E+02	2.53E+02	1.06	Acceptable
EZA	2nd/2014	08/08/14	E10899	Milk	pCi/L	Cesium-134	1.58E+02	1.62E+02	0.97	Acceptable
EZA	2nd/2014	08/08/14	E10899	Milk	pCi/L	Cesium-137	1.27E+02	1.20E+02	1.06	Acceptable
EZA	2nd/2014	08/08/14	E10899	Milk	pCi/L	Cobalt-58	1.20E+02	1.12E+02	1.07	Acceptable
EZA	2nd/2014	08/08/14	E10899	Milk	pCi/L	Manganese-54	1.67E+02	1.56E+02	1.07	Acceptable
EZA	2nd/2014	08/08/14	E10899	Milk	pCi/L	Iron-59	1.02E+02	1.02E+02	1.00	Acceptable
EZA	2nd/2014	08/08/14	E10899	Milk	pCi/L	Zinc-65	2.68E+02	2.52E+02	1.06	Acceptable
EZA	2nd/2014	08/08/14	E10899	Milk	pCi/L	Cobalt-60	2.42E+02	2.24E+02	1.08	Acceptable
EZA	2nd/2014	08/08/14	E10900	Water	pCi/L	Iodine-131	1.13E+02	9.83E+01	1.15	Acceptable
EZA	2nd/2014	08/08/14	E10900	Water	pCi/L	Cerium-141	1.52E+02	1.43E+02	1.06	Acceptable
EZA	2nd/2014	08/08/14	E10900	Water	pCi/L	Chromium-51	3.62E+02	2.94E+02	1.23	Acceptable
EZA	2nd/2014	08/08/14	E10900	Water	pCi/L	Cesium-134	1.69E+02	1.88E+02	0.90	Acceptable
EZA	2nd/2014	08/08/14	E10900	Water	pCi/L	Cesium-137	1.48E+02	1.39E+02	1.06	Acceptable
EZA	2nd/2014	08/08/14	E10900	Water	pCi/L	Cobalt-58	1.34E+02	1.30E+02	1.03	Acceptable
EZA	2nd/2014	08/08/14	E10900	Water	pCi/L	Manganese-54	1.88E+02	1.80E+02	1.04	Acceptable
EZA	2nd/2014	08/08/14	E10900	Water	pCi/L	Iron-59	1.29E+02	1.19E+02	1.09	Acceptable
EZA	2nd/2014	08/08/14	E10900	Water	pCi/L	Zinc-65	3.29E+02	2.93E+02	1.12	Acceptable
EZA	2nd/2014	08/08/14	E10900	Water	pCi/L	Cobalt-60	2.74E+02	2.60E+02	1.05	Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Barium-133	67.8	68.7	57.3-75.6	Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Cesium-134	71	72.3	59.0-79.5	Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Cesium-137	161	163	147-181	Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Cobalt-60	76.7	75.5	68.0-85.5	Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Zinc-65	92	82	73.8-98.5	Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Gross Alpha	45.3	45.4	23.6-57.4	Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Gross Beta	32.3	33.4	21.7-41.1	Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Gross Alpha	48.6	45.4	23.6-57.4	Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Radium-226	8.26	9.06	6.80-10.6	Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Radium-226	8.54	9.06	6.80-10.6	Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Radium-226	9.7	9.06	6.80-10.6	Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Radium-228	5.07	5.07	3.03-6.79	Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Radium-228	5.74	5.07	3.03-6.79	Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Uranium (Nat)	13.9	13.5	10.7-15.4	Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	ug/L	Uranium (Nat) mass	22.25	19.8	15.6-22.6	Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Uranium (Nat)	13	13.5	10.7-15.4	Acceptable
ERA	3rd /	08/25/14	RAD -	Water	ug/L	Uranium	20.7	19.8	15.6-22.6	Acceptable

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	2013		98			(Nat) mass				
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Tritium	10200	11200	9750-12300	Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Tritium	10400	11200	9750-12300	Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Strontium-89	56.3	42.7	32.9-49.8	Not Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Strontium-90	28.2	31.7	23.1-36.7	Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Strontium-89	56.5	42.7	32.9-49.8	Not Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Strontium-90	26	31.7	23.1-36.7	Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Iodine-131	28.6	26.1	21.7-30.8	Acceptable
ERA	3rd / 2013	08/25/14	RAD - 98	Water	pCi/L	Iodine-131	22.3	26.1	21.7-30.8	Acceptable
EZA	3rd/2014	11/22/14	E10993	Cartridge	pCi	Iodine-131	9.47E+01	8.99E+01	1.05	Acceptable
EZA	3rd/2014	11/22/14	E10994	Milk	pCi/L	Strontium-89	9.73E+01	9.69E+01	1.00	Acceptable
EZA	3rd/2014	11/22/14	E10994	Milk	pCi/L	Strontium-90	1.31E+01	1.64E+00	0.80	Acceptable
EZA	3rd/2014	11/22/14	E10995	Milk	pCi/L	Iodine-131	1.04E+02	9.76E+01	1.07	Acceptable
EZA	3rd/2014	11/22/14	E10995	Milk	pCi/L	Cerium-141	1.28E+02	1.26E+02	1.01	Acceptable
EZA	3rd/2014	11/22/14	E10995	Milk	pCi/L	Chromium-51	3.12E+02	2.88E+02	1.08	Acceptable
EZA	3rd/2014	11/22/14	E10995	Milk	pCi/L	Cesium-134	1.51E+02	1.58E+02	0.96	Acceptable
EZA	3rd/2014	11/22/14	E10995	Milk	pCi/L	Cesium-137	2.03E+02	1.93E+02	1.05	Acceptable
EZA	3rd/2014	11/22/14	E10995	Milk	pCi/L	Cobalt-58	1.44E+02	1.43E+02	1.01	Acceptable
EZA	3rd/2014	11/22/14	E10995	Milk	pCi/L	Manganese-54	1.49E+02	1.42E+02	1.05	Acceptable
EZA	3rd/2014	11/22/14	E10995	Milk	pCi/L	Iron-59	1.82E+02	1.58E+02	1.15	Acceptable
EZA	3rd/2014	11/22/14	E10995	Milk	pCi/L	Zinc-65	7.41E+01	7.30E+01	1.01	Acceptable
EZA	3rd/2014	11/22/14	E10995	Milk	pCi/L	Cobalt-60	3.14E+02	2.94E+02	1.06	Acceptable
EZA	3rd/2014	11/22/14	E10996	Water	pCi/L	Iodine-131	1.02E+02	9.88E+01	103	Acceptable
EZA	3rd/2014	11/22/14	E10996	Water	pCi/L	Cerium-141	1.30E+02	1.25E+02	104	Acceptable
EZA	3rd/2014	11/22/14	E10996	Water	pCi/L	Chromium-51	2.75E+02	2.86E+02	0.96	Acceptable
EZA	3rd/2014	11/22/14	E10996	Water	pCi/L	Cesium-134	1.45E+02	1.56E+02	0.93	Acceptable
EZA	3rd/2014	11/22/14	E10996	Water	pCi/L	Cesium-137	1.94E+02	1.92E+02	1.01	Acceptable
EZA	3rd/2014	11/22/14	E10996	Water	pCi/L	Cobalt-58	1.43E+02	1.42E+02	1.01	Acceptable
EZA	3rd/2014	11/22/14	E10996	Water	pCi/L	Manganese-54	1.46E+02	1.41E+02	1.04	Acceptable
EZA	3rd/2014	11/22/14	E10996	Water	pCi/L	Iron-59	1.66E+02	1.57E+02	1.06	Acceptable
EZA	3rd/2014	11/22/14	E10996	Water	pCi/L	Zinc-65	7.55E+01	7.24E+01	1.04	Acceptable
EZA	3rd/2014	11/22/14	E10996	Water	pCi/L	Cobalt-60	3.09E+02	2.95E+02	1.05	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-GrF31	Filter	Bq/sample	Gross Alpha	0.433	0.530	0.16-0.09	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-GrF31	Filter	Bq/sample	Gross Beta	1.060	1.060	0.53-1.59	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Americium-241	88.4	85.5	59.9-111.2	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Cesium-134	588	622	435-809	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Cesium-137	1.67		False Pos Test	Acceptable

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MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Cobalt-57	1160	1116	781-1451	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Cobalt-60	821	779	545-1013	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Iron-55	796	680	476-884	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Manganese-54	1060	1009	706-1312	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Nickel-63	924	980	686-1274	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Plutonium-238	0.92	0.48	Sens. Eval.	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Plutonium-239/240	61.5	58.6	41.0-76.2	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Potassium-40	879	824	577-1071	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Strontium-90	891	858	601-1115	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Technetium-99	466	589	412-766	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	U-234/233	905	89	62-116	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Uranium-238	257	259	181-337	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Zinc-65	605.0	541	379-703	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Americium-241	0.915	0.880	0.62-1.14	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Cesium-134	-0.06		False Pos Test	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Cesium-137	18.4	18.4	12.9-23.9	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Cobalt-57	25	24.7	17.3-32.1	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Cobalt-60	12.5	12.4	8.7-16.1	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Hydrogen-3	216	208	146-270	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Iron-55	34.0	31.5	22.1-41.0	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Manganese-54	14.2	14.0	9.8-18.2	Acceptable

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MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Nickel-63	23.6	24.6	17.2-32.0	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Plutonium-238	0.547	0.618	0.433-0.803	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Plutonium-239/240	0.015	0.005	Sens. Eval.	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Potassium-40	174	161	113-209	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Strontium-90	0.03		False Pos Test	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Technetium-99	6.92	6.99	4.89-9.09	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Uranium-234/233	0.206	0.205	0.144-0.267	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Uranium-238	1.280	1.420	0.99-1.85	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Zinc-65	11.900	10.90	7.6-14.2	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Gross Alpha	0.793	0.701	0.201-1.192	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Gross Beta	6.220	5.94	2.97-8.91	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	ug/sample	Uranium-235	0.040	0.040	0.0278-0.0516	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	ug/sample	Uranium-238	19.3	20.3	14.2-26.4	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	ug/sample	Uranium-Total	19.00	20.4	14.3-26.5	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	ug/sample	Americium-241	0.0561	0.067	0.0472-0.0876	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	Bq/sample	Cesium-134	0.8640	0.96	0.67-1.25	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	Bq/sample	Cesium-137	1.190	1.20	0.84-1.56	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	Bq/sample	Cobalt-57	1.540	1.43	1.00-1.86	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	Bq/sample	Cobalt-60	1.200	1.10	0.77-1.43	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	Bq/sample	Manganese-54	0.808	0.75	0.53-0.98	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	Bq/sample	Plutonium-238	0.155	0.107	0.075-0.139	Acceptable

PT Provider	Quarter / Year	Report Received Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	Bq/sample	Plutonium-239/240	0.048	0.0468	0.0328-0.0608	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	Bq/sample	Strontium-90	0.762	0.70	0.492-0.914	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	Bq/sample	Uranium-234/233	0.037	0.0358	0.0251-0.0465	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	Bq/sample	Uranium-238	0.227	0.253	0.177-0.329	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	Bq/sample	Zinc-65	0.779	0.76	0.53-0.99	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/sample	Americium-241	0.226	0.19	0.135-0.251	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/sample	Cesium-134	4.750	5.20	3.64-6.67	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/sample	Cesium-137	6.910	6.60	4.62-8.58	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/sample	Cobalt-57	-0.002	0.00	False Pos Test	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/sample	Cobalt-60	0.008	0.00	False Pos Test	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/sample	Manganese-54	7.980	7.88	5.52-10.24	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/sample	Plutonium-238	0.001	0.001	Sens. Eval.	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/sample	Plutonium-239/240	0.1510	0.171	0.120-0.222	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/sample	Strontium-90	2.330	2.32	1.62-3.02	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/sample	Uranium-234/233	0.046	0.047	0.0326-0.0606	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/sample	Uranium-238	0.332	0.324	0.227-0.421	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/sample	Zinc-65	2.850	2.63	1.84-3.42	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-SrF-31	Filter	Bq/sample	Strontium-89	3.62	3.79	2.65-4.93	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-SrF-31	Filter	Bq/sample	Strontium-90	3.62	3.79	2.65-4.93	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-XaW-31	Water	Bq/L	Iodine-129	4.56	4.55	3.19-5.92	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Actinium-228	1280	1240	795-1720	Acceptable
ERA	3rd /	11/25/14	MRAD-	Soil	pCi/kg	Americium-	825	763	431-956	Acceptable

PT Provider	Quarter / Year	Report Received Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
	2014		21			241				
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Bismuth-212	1620	1240	330-1820	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Bismuth-214	2900	2810	1690-4040	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Cesium-134	1960	2140	1400-2570	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Cesium-137	6760	6550	5020-8430	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Cobalt-60	4480	4260	2880-5860	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Lead-212	1260	1240	812-1730	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Lead-214	3480	2750	1610-4100	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Manganese-54	<30.0	<1000	0-1000	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Plutonium-238	732	739	444-1020	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Plutonium-239	281	309	202-427	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Potassium-40	11500	10700	7810-14400	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Strontium-90	8790	8420	3210-13300	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Thorium-234	2000	2350	743-4420	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Zinc-65	3910	3270	2600-4350	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Uranium-234	2280	2370	1450-3040	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Uranium-238	2340	2350	1450-2980	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Uranium-Total	4762	4540	2360-6390	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	ug/kg	Uranium-Total(mass)	7020	7050	3890-8870	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Americium-241	2260	2290	1400-3505	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Cesium-134	837	849	545-1100	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Cesium-137	729	644	467-896	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Cobalt-60	818	784	541-1100	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Curium-244	361	367	180-572	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Manganese-54	<25.3	<300	0-300	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Plutonium-238	886	862	514-1180	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Plutonium-239	675	701	430-965	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Potassium-40	35300	30900	22300-43400	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Strontium-90	1230	1710	975-2270	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Uranium-234	1980	1780	1170-2290	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Uranium-238	1970	1760	1170-2240	Acceptable
ERA	3rd /	11/25/14	MRAD-	Vegetation	pCi/kg	Uranium-	4038	3620	2450-4510	Acceptable

PT Provider	Quarter / Year	Report Received Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
	2014		21			Total				
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	ug/kg	Uranium-Total(mass)	5910	5280	3540-6710	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Uranium-234	1670	1780	1170-2290	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Uranium-238	1800	1760	1170-2240	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Uranium-Total	3556	3620	2450-4510	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	ug/kg	Uranium-Total(mass)	5390	5280	3540-6710	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	ug/kg	Uranium-Total(mass)	5860	5280	3540-6710	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Zinc-65	1930	1570	1130-2200	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Americium-241	41.4	38.6	23.8-52.2	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Cesium-134	742	765.0	487-949	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Cesium-137	677	647	486-850	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Cobalt-60	543	523	405-653	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Iron-55	117	120.0	37.2-234	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Manganese-54	<5.87	<50	0.00-50.0	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	ug/Filter	Plutonium-238	32.9	35.7	24.5-46.9	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Plutonium-239	26.8	29.1	21.1-38.0	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Strontium-90	187	168	82.1-252	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Uranium-234	26	28	27.8-41.9	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Uranium-238	28	27.60	17.8-38.2	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Uranium-Total	56	57	31.4-86.3	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	ug/Filter	Uranium-Total(mass)	82.6	82.7	52.9-116	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Zinc-65	629	547	392-755	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Uranium-234	28	28	27.8-41.9	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Uranium-238	25	27.60	17.8-38.2	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Uranium-Total	55	57	31.4-86.3	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	ug/Filter	Uranium-Total(mass)	75.1	82.7	52.9-116	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	ug/Filter	Uranium-Total(mass)	90.7	82.7	52.9-116	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Gross Alpha	47.4	36.9	12.4-57.3	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Gross Beta	27.2	21.1	13.3-30.8	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Americium-241	72.4	68.6	46.2-92.0	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Cesium-134	816.0	850	624-977	Acceptable
ERA	3rd /	11/25/14	MRAD-	Water	pCi/L	Cesium-137	1310	1240	1060-1490	Acceptable

PT Provider	Quarter / Year	Report Received Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
	2014		21							
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Cobalt-60	1130	1070	930-1250	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Iron-55	130	134	79.9-182	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Manganese-54	<6.34	<100	0.00-100	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Plutonium-238	35	33	24.6-41.4	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Plutonium-239	46.4	51	39.7-64.4	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Strontium-90	300	254	165-336	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Uranium-234	42	44	32.9-56.5	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Uranium-238	50	43.50	33.2-53.4	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Uranium-Total	92	89	65.5-115	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	ug/L	Uranium-Total(mass)	137	130	104-157	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Zinc-65	1070	921	768-1160	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Uranium-234	43	44	32.9-56.5	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Uranium-238	45	43.50	33.2-53.4	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Uranium-Total	90	89	65.5-115	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	ug/L	Uranium-Total(mass)	134	130	104-157	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Uranium-234	49	44	32.9-56.5	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Uranium-238	42	43.50	33.2-53.4	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Uranium-Total	93	89	65.5-115	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	ug/L	Uranium-Total(mass)	126	130	104-157	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	ug/L	Uranium-Total(mass)	144	130	104-157	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Gross Alpha	96.2	98	34.8-152	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Gross Beta	86.1	77.5	44.4-115	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Tritium	5490	5500	3680-7840	Acceptable

TABLE 2

2014 ECKERT & ZIEGLER ANALYTICS PERFORMANCE EVALUATION RESULTS

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
EZA	1st/2014	05/16/14	E10846	Cartridge	pCi	Iodine-131	7.83E+01	7.52E+01	1.04	Acceptable
EZA	1st/2014	05/16/14	E10847	Milk	pCi/L	Strontium-89	9.14E+01	9.17E+01	1	Acceptable
EZA	1st/2014	05/16/14	E10847	Milk	pCi/L	Strontium-90	1.27E+01	1.51E+01	0.84	Acceptable
EZA	1st/2014	05/16/14	E10848	Milk	pCi/L	Iodine-131	9.84E+01	9.85E+01	1	Acceptable
EZA	1st/2014	05/16/14	E10848	Milk	pCi/L	Cerium-141	1.21E+02	1.19E+02	1.02	Acceptable
EZA	1st/2014	05/16/14	E10848	Milk	pCi/L	Cr-51	5.19E+02	4.91E+02	1.06	Acceptable
EZA	1st/2014	05/16/14	E10848	Milk	pCi/L	Cesium-134	1.79E+02	2.10E+02	0.85	Acceptable
EZA	1st/2014	05/16/14	E10848	Milk	pCi/L	Cesium-137	2.55E+02	2.53E+02	1.01	Acceptable
EZA	1st/2014	05/16/14	E10848	Milk	pCi/L	Cobalt-58	2.58E+02	2.68E+02	0.96	Acceptable
EZA	1st/2014	05/16/14	E10848	Milk	pCi/L	Mn-54	3.01E+02	2.97E+02	1.01	Acceptable
EZA	1st/2014	05/16/14	E10848	Milk	pCi/L	Iron-59	2.24E+02	2.19E+02	1.02	Acceptable
EZA	1st/2014	05/16/14	E10848	Milk	pCi/L	Zinc-65	3.45E+02	3.23E+02	1.07	Acceptable
EZA	1st/2014	05/16/14	E10848	Milk	pCi/L	Cobalt-60	3.39E+02	3.37E+02	1.00	Acceptable
EZA	1st/2014	05/16/14	E10849	Water	pCi/L	Iodine-131	9.24E+01	8.99E+01	1.03	Acceptable
EZA	1st/2014	05/16/14	E10849	Water	pCi/L	Cerium-141	8.19E+01	7.71E+01	1.06	Acceptable
EZA	1st/2014	05/16/14	E10849	Water	pCi/L	Cr-51	3.32E+02	3.19E+02	1.04	Acceptable
EZA	1st/2014	05/16/14	E10849	Water	pCi/L	Cesium-134	1.27E+02	1.36E+02	0.93	Acceptable
EZA	1st/2014	05/16/14	E10849	Water	pCi/L	Cesium-137	1.69E+02	1.64E+02	1.03	Acceptable
EZA	1st/2014	05/16/14	E10849	Water	pCi/L	Cobalt-58	1.75E+02	1.74E+02	1.01	Acceptable
EZA	1st/2014	05/16/14	E10849	Water	pCi/L	Mn-54	2.08E+02	1.93E+02	1.08	Acceptable
EZA	1st/2014	05/16/14	E10849	Water	pCi/L	Iron-59	1.68E+02	1.42E+02	1.18	Acceptable
EZA	1st/2014	05/16/14	E10849	Water	pCi/L	Zinc-65	2.25E+02	2.10E+02	1.07	Acceptable
EZA	1st/2014	05/16/14	E10849	Water	pCi/L	Cobalt-60	2.31E+02	2.19E+02	1.02	Acceptable
EZA	2nd/2014	08/08/14	E10897	Cartridge	pCi	Iodine-131	8.73E+01	8.54E+01	1.02	Acceptable
EZA	2nd/2014	08/08/14	E10898	Milk	pCi/L	Strontium-89	9.84E+01	9.13E+01	1.08	Acceptable
EZA	2nd/2014	08/08/14	E10898	Milk	pCi/L	Strontium-90	1.44E+01	1.45E+01	0.99	Acceptable
EZA	2nd/2014	08/08/14	E10899	Milk	pCi/L	Iodine-131	9.89E+01	9.09E+01	1.09	Acceptable
EZA	2nd/2014	08/08/14	E10899	Milk	pCi/L	Cerium-141	1.38E+02	1.24E+02	1.12	Acceptable
EZA	2nd/2014	08/08/14	E10899	Milk	pCi/L	Chromium-51	2.68E+02	2.53E+02	1.06	Acceptable
EZA	2nd/2014	08/08/14	E10899	Milk	pCi/L	Cesium-134	1.58E+02	1.62E+02	0.97	Acceptable
EZA	2nd/2014	08/08/14	E10899	Milk	pCi/L	Cesium-137	1.27E+02	1.20E+02	1.06	Acceptable
EZA	2nd/2014	08/08/14	E10899	Milk	pCi/L	Cobalt-58	1.20E+02	1.12E+02	1.07	Acceptable
EZA	2nd/2014	08/08/14	E10899	Milk	pCi/L	Manganese-54	1.67E+02	1.56E+02	1.07	Acceptable
EZA	2nd/2014	08/08/14	E10899	Milk	pCi/L	Iron-59	1.02E+02	1.02E+02	1.00	Acceptable
EZA	2nd/2014	08/08/14	E10899	Milk	pCi/L	Zinc-65	2.68E+02	2.52E+02	1.06	Acceptable
EZA	2nd/2014	08/08/14	E10899	Milk	pCi/L	Cobalt-60	2.42E+02	2.24E+02	1.08	Acceptable
EZA	2nd/2014	08/08/14	E10900	Water	pCi/L	Iodine-131	1.13E+02	9.83E+01	1.15	Acceptable

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance - Range/ Ratio	Evaluation
EZA	2nd/2014	08/08/14	E10900	Water	pCi/L	Cerium-141	1.52E+02	1.43E+02	1.06	Acceptable
EZA	2nd/2014	08/08/14	E10900	Water	pCi/L	Chromium-51	3.62E+02	2.94E+02	1.23	Acceptable
EZA	2nd/2014	08/08/14	E10900	Water	pCi/L	Cesium-134	1.69E+02	1.88E+02	0.90	Acceptable
EZA	2nd/2014	08/08/14	E10900	Water	pCi/L	Cesium-137	1.48E+02	1.39E+02	1.06	Acceptable
EZA	2nd/2014	08/08/14	E10900	Water	pCi/L	Cobalt-58	1.34E+02	1.30E+02	1.03	Acceptable
EZA	2nd/2014	08/08/14	E10900	Water	pCi/L	Manganese-54	1.88E+02	1.80E+02	1.04	Acceptable
EZA	2nd/2014	08/08/14	E10900	Water	pCi/L	Iron-59	1.29E+02	1.19E+02	1.09	Acceptable
EZA	2nd/2014	08/08/14	E10900	Water	pCi/L	Zinc-65	3.29E+02	2.93E+02	1.12	Acceptable
EZA	2nd/2014	08/08/14	E10900	Water	pCi/L	Cobalt-60	2.74E+02	2.60E+02	1.05	Acceptable
EZA	3rd/2014	11/22/14	E10993	Cartridge	pCi	Iodine-131	9.47E+01	8.99E+01	1.05	Acceptable
EZA	3rd/2014	11/22/14	E10994	Milk	pCi/L	Strontium-89	9.73E+01	9.69E+01	1.00	Acceptable
EZA	3rd/2014	11/22/14	E10994	Milk	pCi/L	Strontium-90	1.31E+01	1.64E+01	0.80	Acceptable
EZA	3rd/2014	11/22/14	E10995	Milk	pCi/L	Iodine-131	1.04E+02	9.76E+01	1.07	Acceptable
EZA	3rd/2014	11/22/14	E10995	Milk	pCi/L	Cerium-141	1.28E+02	1.26E+02	1.01	Acceptable
EZA	3rd/2014	11/22/14	E10995	Milk	pCi/L	Chromium-51	3.12E+02	2.88E+02	1.08	Acceptable
EZA	3rd/2014	11/22/14	E10995	Milk	pCi/L	Cesium-134	1.51E+02	1.58E+02	0.96	Acceptable
EZA	3rd/2014	11/22/14	E10995	Milk	pCi/L	Cesium-137	2.03E+02	1.93E+02	1.05	Acceptable
EZA	3rd/2014	11/22/14	E10995	Milk	pCi/L	Cobalt-58	1.44E+02	1.43E+02	1.01	Acceptable
EZA	3rd/2014	11/22/14	E10995	Milk	pCi/L	Manganese-54	1.49E+02	1.42E+02	1.05	Acceptable
EZA	3rd/2014	11/22/14	E10995	Milk	pCi/L	Iron-59	1.82E+02	1.58E+02	1.15	Acceptable
EZA	3rd/2014	11/22/14	E10995	Milk	pCi/L	Zinc-65	7.41E+01	7.30E+01	1.01	Acceptable
EZA	3rd/2014	11/22/14	E10995	Milk	pCi/L	Cobalt-60	3.14E+02	2.94E+02	1.06	Acceptable
EZA	3rd/2014	11/22/14	E10996	Water	pCi/L	Iodine-131	1.02E+02	9.88E+01	103	Acceptable
EZA	3rd/2014	11/22/14	E10996	Water	pCi/L	Cerium-141	1.30E+02	1.25E+02	104	Acceptable
EZA	3rd/2014	11/22/14	E10996	Water	pCi/L	Chromium-51	2.75E+02	2.86E+02	0.96	Acceptable
EZA	3rd/2014	11/22/14	E10996	Water	pCi/L	Cesium-134	1.45E+02	1.56E+02	0.93	Acceptable
EZA	3rd/2014	11/22/14	E10996	Water	pCi/L	Cesium-137	1.94E+02	1.92E+02	1.01	Acceptable
EZA	3rd/2014	11/22/14	E10996	Water	pCi/L	Cobalt-58	1.43E+02	1.42E+02	1.01	Acceptable
EZA	3rd/2014	11/22/14	E10996	Water	pCi/L	Manganese-54	1.46E+02	1.41E+02	1.04	Acceptable
EZA	3rd/2014	11/22/14	E10996	Water	pCi/L	Iron-59	1.66E+02	1.57E+02	1.06	Acceptable
EZA	3rd/2014	11/22/14	E10996	Water	pCi/L	Zinc-65	7.55E+01	7.24E+01	1.04	Acceptable
EZA	3rd/2014	11/22/14	E10996	Water	pCi/L	Cobalt-60	3.09E+02	2.95E+02	1.05	Acceptable

TABLE 3

2014 DEPARTMENT OF ENERGY MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP) RESULTS

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MAPEP	2nd/2014	06/05/14	MAPEP-14-GrF30	Filter	Bq/sample	Gross Alpha	1.980	1.77	0.53-3.01	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-GrF30	Filter	Bq/sample	Gross Beta	0.823	0.77	0.39-1.16	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Americium-241	65	68	47.6-88.4	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Cesium-134	5.44	0	False Pos Test	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Cesium-137	1270	1238	867-1609	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Cobalt-57	947	966	676-1256	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Cobalt-60	0.581	1.220	Sens. Eval.	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Iron-55	580	643	444-824	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Manganese-54	1470	1430	1001-1859	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Nickel-63	6.95	0	False Pos Test	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Plutonium-238	89.7	96.0	67-125	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Plutonium-239/240	69.80	76.8	53.8-99.8	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Potassium-40	703	622	435-809	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Strontium-90	1.48	0	False Pos Test	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Technetium-99	37.1	0	False Pos Test	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	U-234/233	30.5	81.0	57-105	Not Accept.
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Uranium-238	35	83	58-108	Not Accept.
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaS30	Soil	Bq/kg	Zinc-65	766	695	487-904	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Am-241	0.759	0.720	0.504-0.936	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Cesium-134	21.4	23.1	16.2-30.0	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Cesium-137	29.70	28.9	20.2-37.6	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Cobalt-57	28.0	27.5	19.3-35.8	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Cobalt-60	16.6	16.0	11.2-20.8	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Hydrogen-3	308	321	225-417	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Iron-55	0.3	0.0	False Pos Test	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Manganese-54	14.4	13.9	9.7-18.1	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Nickel-63	31.4	34.0	23.8-44.2	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Plutonium-238	0.764	0.828	0.580-1.076	Acceptable

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Pu-239/240	0.6590	0.6760	0.473-0.879	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Potassium-40	0.460	0	False Pos Test	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Strontium-90	8.32	8.51	5.96-11.06	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Technetium-99	9.5	10.3	7.2-13.4	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	U-234/233	0.210	0.225	0.158-0.293	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Uranium-238	1.41	1.45	1.02-1.89	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Zinc-65	-0.126	0.0	False Pos Test	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Gross Alpha	0.96	0.85	0.255-1.443	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Gross Beta	4.7	4.2	2.10-6.29	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-MaW30	Water	Bq/L	Iodine-129	0.0227	0.00	False Pos Test	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	ug/sample	Uranium-235	0.018	0.020	0.014-0.026	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	ug/sample	Uranium-238	8.77	10.4	7.3-13.5	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	ug/sample	Uranium-Total	8.80	10.4	7.3-13.5	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	ug/sample	Americium-241	0.086	0.090	0.063-0.117	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/sample	Cesium-134	1.85	1.91	1.34-2.48	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/sample	Cesium-137	1.81	1.76	1.23-2.29	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/sample	Cobalt-57	0.0757	0.00	False Pos Test	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/sample	Cobalt-60	1.490	1.39	0.97-1.81	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/sample	Manganese-54	0.0138	0.00	False Pos Test	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/sample	Plutonium-238	0.000819	0.00090	Sens. Eval.	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/sample	Pu-239/240	0.071	0.7720	0.054-0.1004	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/sample	Strontium-90	1.19	1.18	0.83-1.53	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/sample	U-234/233	0.0159	0.0195	0.0137-0.0254	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/sample	Uranium-238	0.118	0.129	0.090-0.168	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/sample	Zinc-65	0.246	0.00	False Pos Test	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/sample	Gross Alpha	1.980	1.77	0.53-3.01	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/sample	Gross Beta	0.83	0.77	0.39-1.16	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdF30	Filter	Bq/sample	Americium-241	0.106	0.104	0.073-0.135	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	ug/sample	Uranium-235	0.261	0.0268	0.0188-0.0348	Not Accept.
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	ug/sample	Uranium-238	12.7	13.3	9.3-17.3	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	ug/sample	Uranium-Total	12.7	13.3	9.3-17.3	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	ug/sample	Americium-241	0.1100	0.108	0.076-0.140	Acceptable

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	Bq/sample	Cesium-134	5.65	6.04	4.23-7.85	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	Bq/sample	Cesium-137	4.98	4.74	3.32-6.16	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	Bq/sample	Cobalt-57	11.1	10.1	7.1-13.1	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	Bq/sample	Cobalt-60	7.21	6.93	4.85-9.01	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	Bq/sample	Manganese-54	9.24	8.62	6.03-11.21	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	Bq/sample	Plutonium-238	0.116	0.121	0.085-0.157	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	Bq/sample	Pu-239/240	0.134	0.154	0.108-0.0200	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	Bq/sample	Strontium-90	1.580	1.46	1.02-1.90	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	Bq/sample	U-234/233	0.2640	0.2530	0.0177-0.0329	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	Bq/sample	Uranium-238	0.174	0.165	0.116-0.215	Acceptable
MAPEP	2nd/2014	06/05/14	MAPEP-14-RdV30	Vegetation	Bq/sample	Zinc-65	8.87	7.00	4.38-8.13	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-GrF31	Filter	Bq/sample	Gross Alpha	0.433	0.530	0.16-0.09	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-GrF31	Filter	Bq/sample	Gross Beta	1.060	1.060	0.53-1.59	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Americium-241	88.4	85.5	59.9-111.2	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Cesium-134	588	622	435-809	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Cesium-137	1.67		False Pos Test	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Cobalt-57	1160	1116	781-1451	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Cobalt-60	821	779	545-1013	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Iron-55	796	680	476-884	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Manganese-54	1060	1009	706-1312	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Nickel-63	924	980	686-1274	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Plutonium-238	0.92	0.48	Sens. Eval.	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Plutonium-239/240	61.5	58.6	41.0-76.2	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Potassium-40	879	824	577-1071	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Strontium-90	891	858	601-1115	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Technetium-99	466	589	412-766	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	U-234/233	905	89	62-116	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Uranium-238	257	259	181-337	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaS31	Soil	Bq/Kg	Zinc-65	605.0	541	379-703	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Americium-241	0.915	0.880	0.62-1.14	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Cesium-134	-0.06		False Pos Test	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Cesium-137	18.4	18.4	12.9-23.9	Acceptable

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Cobalt-57	25	24.7	17.3-32.1	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Cobalt-60	12.5	12.4	8.7-16.1	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Hydrogen-3	216	208	146-270	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Iron-55	34.0	31.5	22.1-41.0	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Manganese-54	14.2	14.0	9.8-18.2	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Nickel-63	23.6	24.6	17.2-32.0	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Plutonium-238	0.547	0.618	0.433-0.803	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Plutonium-239/240	0.015	0.005	Sens. Eval.	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Potassium-40	174	161	113-209	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Strontium-90	0.03		False Pos Test	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Technetium-99	6.92	6.99	4.89-9.09	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Uranium-234/233	0.206	0.205	0.144-0.267	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Uranium-238	1.280	1.420	0.99-1.85	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Zinc-65	11.900	10.90	7.6-14.2	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Gross Alpha	0.793	0.701	0.201-1.192	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-MaW31	Water	Bq/L	Gross Beta	6.220	5.94	2.97-8.91	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	ug/sample	Uranium-235	0.040	0.040	0.0278-0.0516	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	ug/sample	Uranium-238	19.3	20.3	14.2-26.4	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	ug/sample	Uranium-Total	19.00	20.4	14.3-26.5	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	ug/sample	Americium-241	0.0561	0.067	0.0472-0.0876	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	Bq/sample	Cesium-134	0.8640	0.96	0.67-1.25	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	Bq/sample	Cesium-137	1.190	1.20	0.84-1.56	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	Bq/sample	Cobalt-57	1.540	1.43	1.00-1.86	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	Bq/sample	Cobalt-60	1.200	1.10	0.77-1.43	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	Bq/sample	Manganese-54	0.808	0.75	0.53-0.98	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	Bq/sample	Plutonium-238	0.115	0.107	0.075-0.139	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	Bq/sample	Plutonium-239/240	0.048	0.0468	0.0328-0.0608	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	Bq/sample	Strontium-90	0.762	0.70	0.492-0.914	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	Bq/sample	Uranium-234/233	0.037	0.0358	0.0251-0.0465	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	Bq/sample	Uranium-238	0.227	0.253	0.177-0.329	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdF31	Filter	Bq/sample	Zinc-65	0.779	0.76	0.53-0.99	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/sample	Americium-241	0.226	0.19	0.135-0.251	Acceptable

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/sample	Cesium-134	4.750	5.20	3.64-6.67	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/sample	Cesium-137	6.910	6.60	4.62-8.58	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/sample	Cobalt-57	-0.002	0.00	False Pos Test	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/sample	Cobalt-60	0.008	0.00	False Pos Test	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/sample	Manganese-54	7.980	7.88	5.52-10.24	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/sample	Plutonium-238	0.001	0.001	Sens. Eval.	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/sample	Plutonium-239/240	0.1510	0.171	0.120-0.222	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/sample	Strontium-90	2.330	2.32	1.62-3.02	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/sample	Uranium-234/233	0.046	0.047	0.0326-0.0606	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/sample	Uranium-238	0.332	0.324	0.227-0.421	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-RdV31	Vegetation	Bq/sample	Zinc-65	2.850	2.63	1.84-3.42	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-SrF-31	Filter	Bq/sample	Strontium-89	3.62	3.79	2.65-4.93	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-SrF-31	Filter	Bq/sample	Strontium-90	3.62	3.79	2.65-4.93	Acceptable
MAPEP	4th /2014	01/09/15	MAPEP-14-XaW-31	Water	Bq/L	Iodine-129	4.56	4.55	3.19-5.92	Acceptable

TABLE 4

2014 ERA PROGRAM PERFORMANCE EVALUATION RESULTS

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Barium-133	80.6	76.2	63.8-83.8	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Cesium-134	64.7	66.8	54.4-73.5	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Cesium-137	112.0	109	98.1-122	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Cobalt-60	95.0	88.7	79.8-99.9	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Zinc-65	200	185	166-218	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Gross Alpha	34.8	36.1	18.6-46.4	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Gross Beta	19.6	22.3	13.5-30.4	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Gross Alpha	34.6	36.1	18.6-46.4	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Radium-226	16.2	16.8	12.5-19.2	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Radium-228	4.62	5.04	3.01-6.67	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Uranium (Nat)	7.39	7.23	5.51-8.53	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	ug/L	Uranium (Nat) mass	11.00	10.6	8.07-12.5	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Radium-226	15.10	16.8	12.5-19.2	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Radium-228	4.66	5.04	3.01-6.67	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Uranium (Nat)	7.47	7.23	5.51-8.53	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	ug/L	Uranium (Nat) mass	11.4	10.6	8.07-12.5	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Tritium	3320	3580	3030-3950	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Strontium-89	44.1	44.4	34.4-51.6	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Strontium-90	34.2	30.3	22.1-35.2	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Strontium-89	38.9	44.4	34.4-51.6	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Strontium-90	27.1	30.3	22.1-35.2	Acceptable
ERA	1st / 2014	02/06/14	011014L	Water	pCi/L	Strontium-89	42.3	38.7	29.3-45.7	Acceptable
ERA	1st / 2014	02/06/14	011014L	Water	pCi/L	Strontium-89	42.2	38.7	29.3-45.7	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Iodine-131	25.2	24.4	20.2-28.9	Acceptable
ERA	1st / 2014	02/24/14	RAD - 96	Water	pCi/L	Iodine-131	22.4	24.4	20.2-28.9	Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Barium-133	67.8	68.7	57.3-75.6	Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Cesium-134	71	72.3	59.0-79.5	Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Cesium-137	161	163	147-181	Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Cobalt-60	76.7	75.5	68.0-85.5	Acceptable

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Zinc-65	92	82	73.8-98.5	Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Gross Alpha	45.3	45.4	23.6-57.4	Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Gross Beta	32.3	33.4	21.7-41.1	Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Gross Alpha	48.6	45.4	23.6-57.4	Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Radium-226	8.26	9.06	6.80-10.6	Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Radium-226	8.54	9.06	6.80-10.6	Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Radium-226	9.7	9.06	6.80-10.6	Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Radium-228	5.07	5.07	3.03-6.79	Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Radium-228	5.74	5.07	3.03-6.79	Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Uranium (Nat)	13.9	13.5	10.7-15.4	Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	ug/L	Uranium (Nat) mass	22.25	19.8	15.6-22.6	Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Uranium (Nat)	13	13.5	10.7-15.4	Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	ug/L	Uranium (Nat) mass	20.7	19.8	15.6-22.6	Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Tritium	10200	11200	9750-12300	Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Tritium	10400	11200	9750-12300	Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Strontium-89	56.3	42.7	32.9-49.8	Not Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Strontium-90	14.3	31.7	23.1-36.7	Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Strontium-89	56.5	42.7	32.9-49.8	Not Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Strontium-90	26	31.7	23.1-36.7	Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Iodine-131	28.6	26.1	21.7-30.8	Acceptable
ERA	3rd / 2014	08/25/14	RAD - 98	Water	pCi/L	Iodine-131	22.3	26.1	21.7-30.8	Acceptable

TABLE 5

2014 ERA PROGRAM (MRAD) PERFORMANCE EVALUATION RESULTS

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Actinium-228	1140	1240	795-1720	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Americium-241	418	399	233-518	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Bismuth-212	976	1240	330-1820	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Bismuth-214	2290	1960	1180-2820	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Cesium-134	3080	3390	2220-4070	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Cesium-137	8310	8490	6510-10900	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Cobalt-60	6570	6830	4620-9400	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Lead-212	1330	1240	812-1730	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Lead-214	2800	2070	1210-3090	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Manganese-54	<44.3	<1000	0-1000	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Plutonium-238	579	578	348-797	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Plutonium-239	488	471.00	308-651	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Potassium-40	10500	10500	7660-14100	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Strontium-90	2500	2780	1060-4390	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Thorium-234	3420	3360	1060-6320	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Zinc-65	5700	5400	4300-7180	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Strontium-90	6730	8530	3250-13500	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Uranium-234	2602	3390	2070-4350	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Uranium-238	2425	3360	2080-4260	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Uranium-Total	5027	6910	3750-9120	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	ug/kg	Uranium-Total(mass)	7110	10100	5570-12700	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Uranium-234	3440	3390	2070-4350	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Uranium-238	3680	3360	2080-4260	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Uranium-Total	7310	6910	3750-9120	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	ug/kg	Uranium-Total(mass)	11000	10100	5570-12700	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Uranium-234	3740	3390	2070-4350	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Uranium-238	3780	3360	2080-4260	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	pCi/kg	Uranium-Total	7683	6910	3750-9120	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Soil	ug/kg	Uranium-Total(mass)	11300	10100	5570-12700	Acceptable

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
ERA	2nd/2014	05/16/14	MRAD-20	Soil	ug/kg	Uranium-Total(mass)	11200	10100	5570-12700	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Am-241	1670	1490	911-1980	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Cesium-134	657	646	415-839	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Cesium-137	861	880	638-1220	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Cobalt-60	997	926	639-1290	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Curium-244	514	516	253-804	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Manganese-54	<62.2	<300	0.00-300	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Plutonium-238	2230	2110	1260-2890	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Plutonium-239	3810	3740	2300-5150	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Potassium-40	30800	31900	23000-44800	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Strontium-90	2330	2580	1470-3420	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Uranium-234	1920	1760	1160-2260	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Uranium-238	1970	1750	1170-2220	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Uranium-Total	4025	3580	2430-4460	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	ug/kg	Uranium-Total(mass)	5920	5240	3510-6650	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Zinc-65	1030	919	663-1290	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Uranium-234	1730	1760	1160-2260	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Uranium-238	2000	1750	1170-2220	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	pCi/kg	Uranium-Total	3817	3580	2430-4460	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	ug/kg	Uranium-Total(mass)	5990	5240	3510-6650	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Vegetation	ug/kg	Uranium-Total(mass)	5620	5240	3510-6650	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Americium-241	60.2	59.7	36.8-80.8	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Cesium-134	920	1010	643-1250	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Cesium-137	816	828	622-1090	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Cobalt-60	1130	1120	867-1400	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Iron-55	254	240	74.4-469	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Manganese-54	<6.64	<50.0	0-50.0	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Plutonium-238	51.3	56.3	38.6-74.0	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Plutonium-239	47.5	48.6	35.2-63.5	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Strontium-90	76.7	78.9	38.6-118	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Uranium-234	33.8	36.4	22.6-54	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Uranium-238	34.5	36.1	23.3-49.9	Acceptable

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Uranium-Total	70.3	74.3	41.1-113	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	ug/Filter	Uranium-Total(mass)	104	108	69.1-152	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Zinc-65	737	667	478-921	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Uranium-234	35.5	36.4	22.6-54	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Uranium-238	35.3	36.1	23.3-49.9	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Uranium-Total	72.4	74.3	41.1-113	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	ug/Filter	Uranium-Total(mass)	105	108	69.1-152	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	ug/Filter	Uranium-Total(mass)	100	108	69.1-152	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Gross Alpha	60.9	46	15.4-71.4	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Filter	pCi/Filter	Gross Beta	58.9	53.8	34.0-78.4	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Americium-241	186	114	76.8-153	Not Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Cesium-134	1540	1660	1220-1910	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Cesium-137	2760	2690	2280-3220	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Cobalt-60	1320	1270	1100-1490	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Iron-55	1230	1200	716-1630	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Manganese-54	<7.54	<100	0.00-100	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Plutonium-238	37	44	32.6-54.9	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Plutonium-239	124	160	124-202	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Strontium-90	95	890	580-1180	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-234	77.8	82.4	61.9-106	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-238	50.8	48.4	36.9-59.4	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-Total	156	168	123-217	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	ug/L	Uranium-Total(mass)	233	245	195-296	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Zinc-65	2030	1800	1500-2270	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-234	82.1	82.4	61.9-106	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-238	84.6	48.4	36.9-59.4	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-Total	170	168	123-217	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	ug/L	Uranium-Total(mass)	253	245	195-296	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-234	80.5	82.4	61.9-106	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-238	90.0	48.4	36.9-59.4	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-Total	175	168	123-217	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	ug/L	Uranium-Total(mass)	269	245	195-296	Acceptable

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-234	77.8	82.4	61.9-106	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-238	78.3	48.4	36.9-59.4	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Uranium-Total	156	168	123-217	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	ug/L	Uranium-Total(mass)	233	245	195-296	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	ug/L	Uranium-Total(mass)	232	245	195-296	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Gross Alpha	141.0	133	47.2-206	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Gross Beta	172	174.0	99.6-258	Acceptable
ERA	2nd/2014	05/16/14	MRAD-20	Water	pCi/L	Tritium	5280	5580	3740-7960	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Actinium-228	1280	1240	795-1720	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Americium-241	825	763	431-956	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Bismuth-212	1620	1240	330-1820	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Bismuth-214	2900	2810	1690-4040	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Cesium-134	1960	2140	1400-2570	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Cesium-137	6760	6550	5020-8430	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Cobalt-60	4480	4260	2880-5860	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Lead-212	1260	1240	812-1730	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Lead-214	3480	2750	1610-4100	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Manganese-54	<30.0	<1000	0-1000	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Plutonium-238	732	739	444-1020	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Plutonium-239	281	309	202-427	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Potassium-40	11500	10700	7810-14400	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Strontium-90	8790	8420	3210-13300	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Thorium-234	2000	2350	743-4420	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Zinc-65	3910	3270	2600-4350	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Uranium-234	2280	2370	1450-3040	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Uranium-238	2340	2350	1450-2980	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	pCi/kg	Uranium-Total	4762	4540	2360-6390	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Soil	ug/kg	Uranium-Total(mass)	7020	7050	3890-8870	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Am-241	2260	2290	1400-3505	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Cesium-134	837	849	545-1100	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Cesium-137	729	644	467-896	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Cobalt-60	818	784	541-1100	Acceptable

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Curium-244	361	367	180-572	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Manganese-54	<25.3	<300	0-300	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Plutonium-238	886	862	514-1180	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Plutonium-239	675	701	430-965	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Potassium-40	35300	30900	22300-43400	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Strontium-90	1230	1710	975-2270	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Uranium-234	1980	1780	1170-2290	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Uranium-238	1970	1760	1170-2240	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Uranium-Total	4038	3620	2450-4510	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	ug/kg	Uranium-Total(mass)	5910	5280	3540-6710	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Uranium-234	1670	1780	1170-2290	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Uranium-238	1800	1760	1170-2240	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Uranium-Total	3556	3620	2450-4510	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	ug/kg	Uranium-Total(mass)	5390	5280	3540-6710	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	ug/kg	Uranium-Total(mass)	5860	5280	3540-6710	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Vegetation	pCi/kg	Zinc-65	1930	1570	1130-2200	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Americium-241	41.4	38.6	23.8-52.2	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Cesium-134	742	765.0	487-949	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Cesium-137	677	647	486-850	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Cobalt-60	543	523	405-653	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Iron-55	117	120.0	37.2-234	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Manganese-54	<5.87	<50	0.00-50.0	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	ug/Filter	Plutonium-238	32.9	35.7	24.5-46.9	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Plutonium-239	26.8	29.1	21.1-38.0	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Strontium-90	187	168	82.1-252	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Uranium-234	26	28	27.8-41.9	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Uranium-238	28	27.60	17.8-38.2	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Uranium-Total	56	57	31.4-86.3	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	ug/Filter	Uranium-Total(mass)	82.6	82.7	52.9-116	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Zinc-65	629	547	392-755	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Uranium-234	28	28	27.8-41.9	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Uranium-238	25	27.60	17.8-38.2	Acceptable

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Uranium-Total	55	57	31.4-86.3	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	ug/Filter	Uranium-Total(mass)	75.1	82.7	52.9-116	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	ug/Filter	Uranium-Total(mass)	90.7	82.7	52.9-116	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Gross Alpha	47.4	36.9	12.4-57.3	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Filter	pCi/Filter	Gross Beta	27.2	21.1	13.3-30.8	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Americium-241	72.4	68.6	46.2-92.0	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Cesium-134	816.0	850	624-977	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Cesium-137	1310	1240	1060-1490	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Cobalt-60	1130	1070	930-1250	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Iron-55	130	134	79.9-182	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Manganese-54	<6.34	<100	0.00-100	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Plutonium-238	35	33	24.6-41.4	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Plutonium-239	46.4	51	39.7-64.4	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Strontium-90	300	254	165-336	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Uranium-234	42	44	32.9-56.5	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Uranium-238	50	43.50	33.2-53.4	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Uranium-Total	92	89	65.5-115	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	ug/L	Uranium-Total(mass)	137	130	104-157	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Zinc-65	1070	921	768-1160	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Uranium-234	43	44	32.9-56.5	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Uranium-238	45	43.50	33.2-53.4	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Uranium-Total	90	89	65.5-115	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	ug/L	Uranium-Total(mass)	134	130	104-157	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Uranium-234	49	44	32.9-56.5	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Uranium-238	42	43.50	33.2-53.4	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Uranium-Total	93	89	65.5-115	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	ug/L	Uranium-Total(mass)	126	130	104-157	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	ug/L	Uranium-Total(mass)	144	130	104-157	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Gross Alpha	96.2	98	34.8-152	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Gross Beta	86.1	77.5	44.4-115	Acceptable
ERA	3rd / 2014	11/25/14	MRAD-21	Water	pCi/L	Tritium	5490	5500	3680-7840	Acceptable

FIGURE 1

COBALT-60 PERFORMANCE EVALUATION RESULTS AND % BIAS

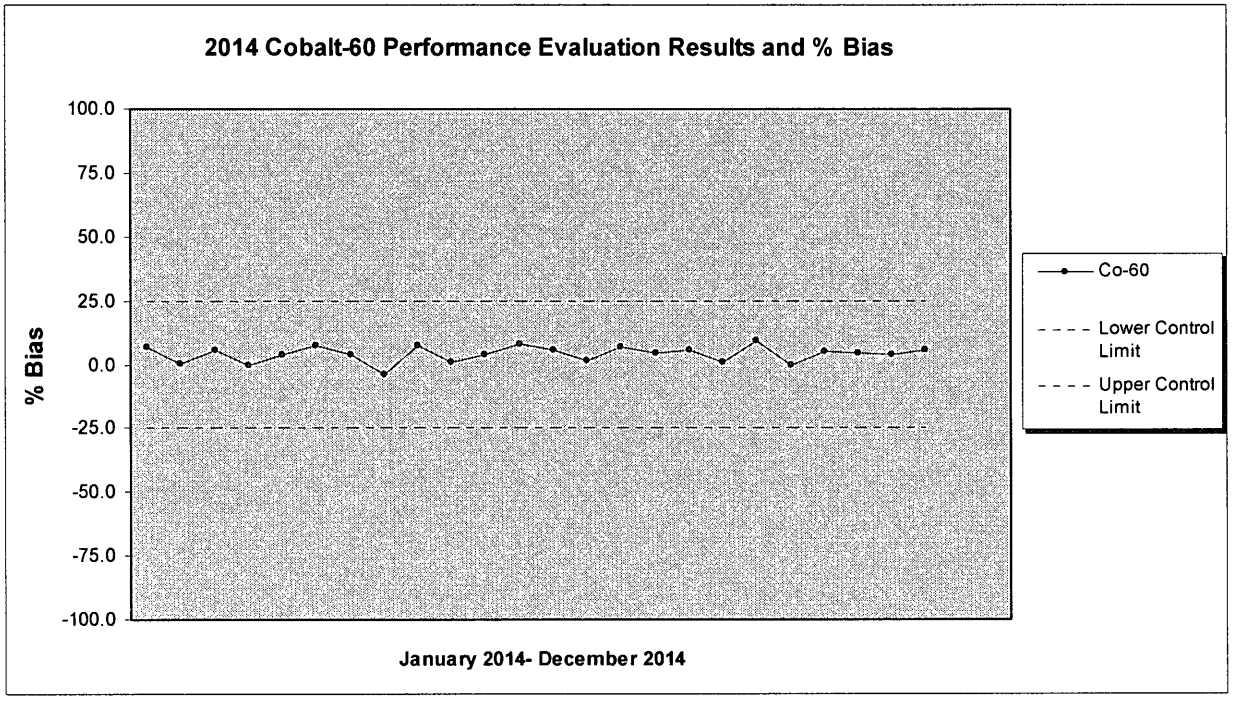

FIGURE 2

CESIUM-137 PERFORMANCE EVALUATION RESULTS AND % BIAS

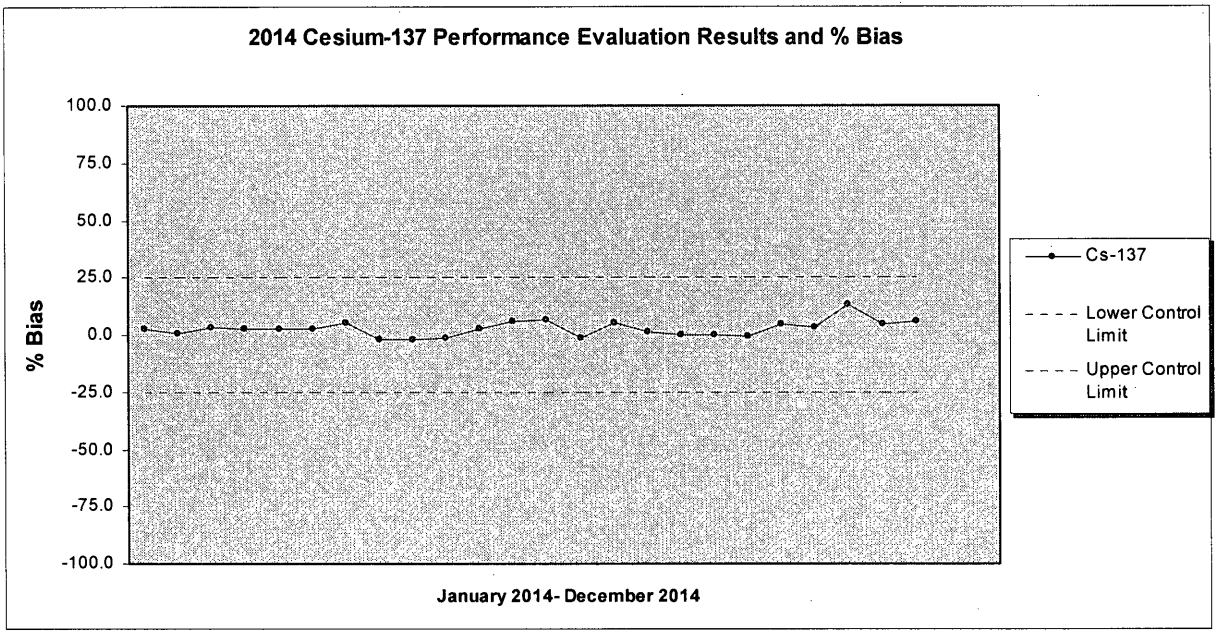

FIGURE 3

TRITIUM PERFORMANCE EVALUATION RESULTS AND % BIAS

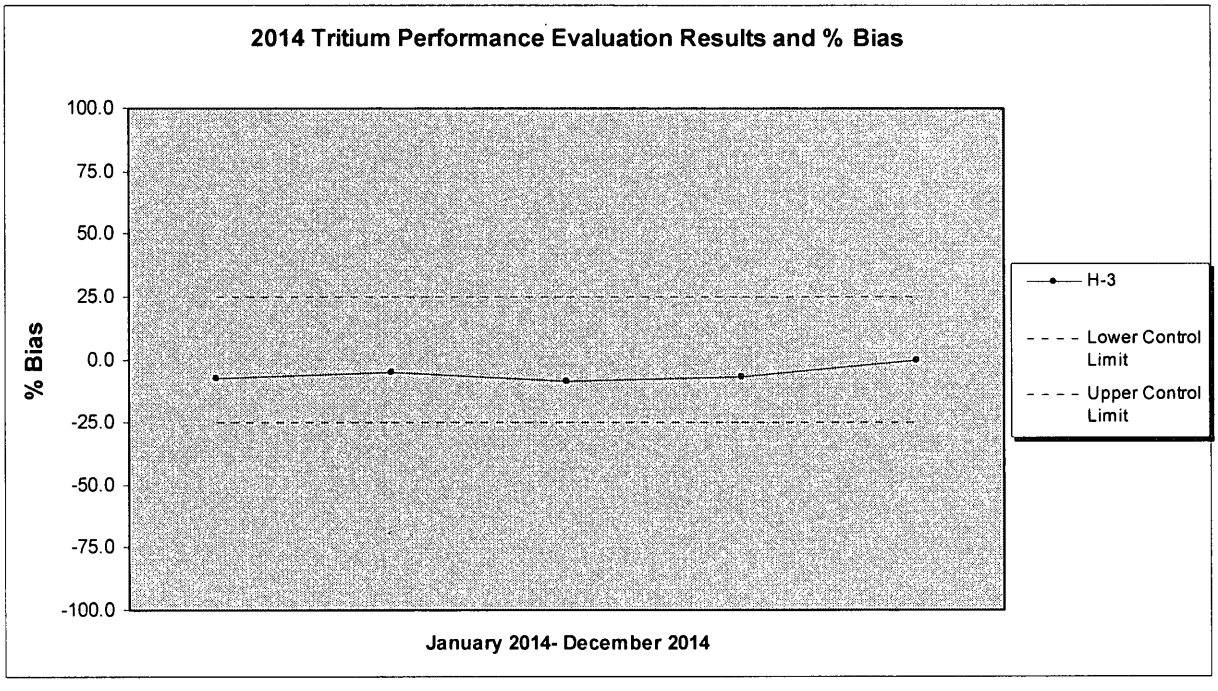

FIGURE 4

STRONTIUM-90 PERFORMANCE EVALUATION RESULTS AND % BIAS

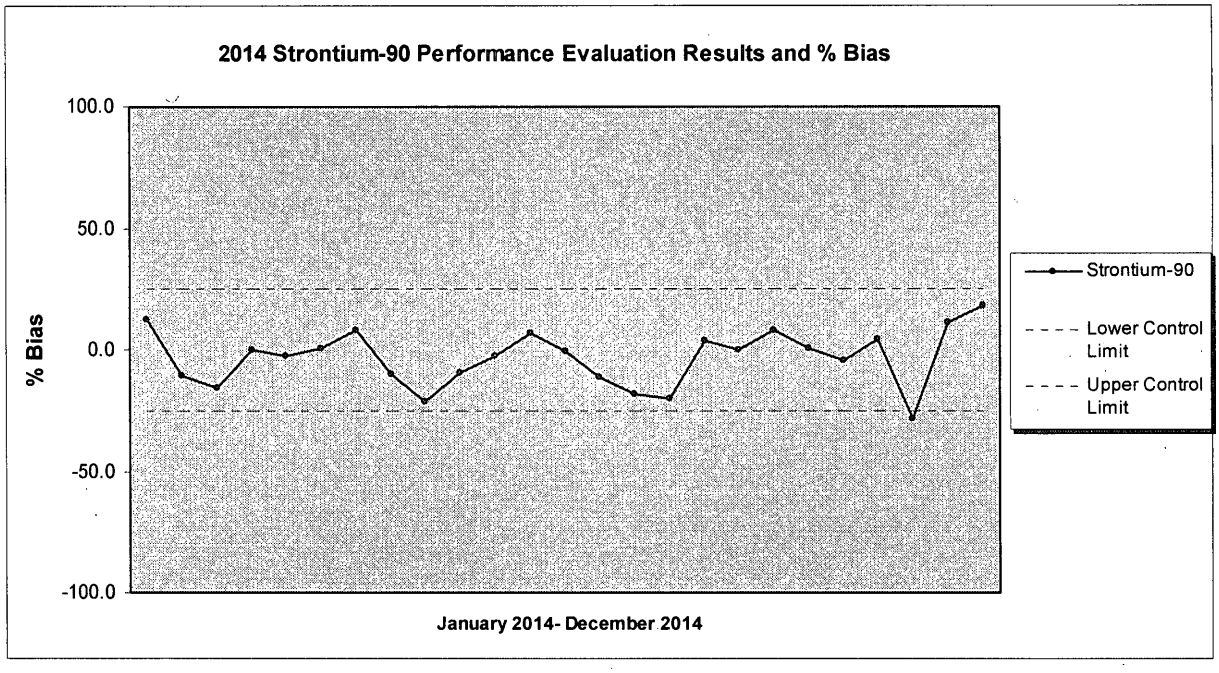

FIGURE 5

GROSS ALPHA PERFORMANCE EVALUATION RESULTS AND % BIAS

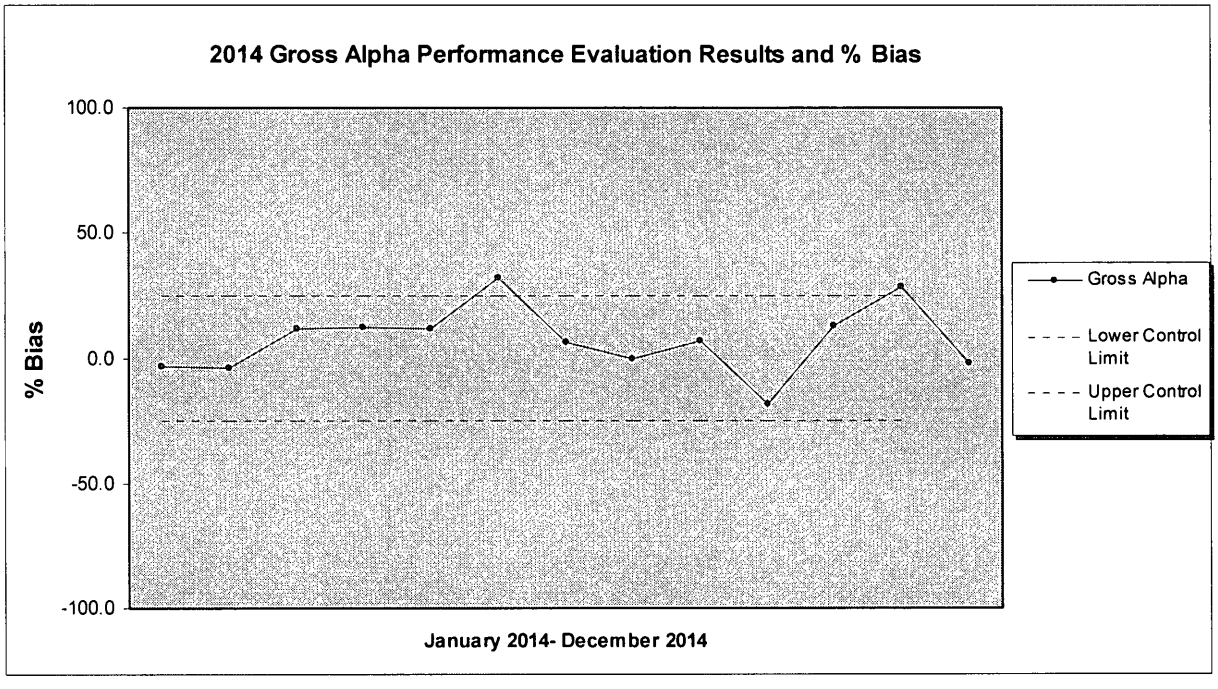

FIGURE 6

GROSS BETA PERFORMANCE EVALUATION RESULTS AND % BIAS

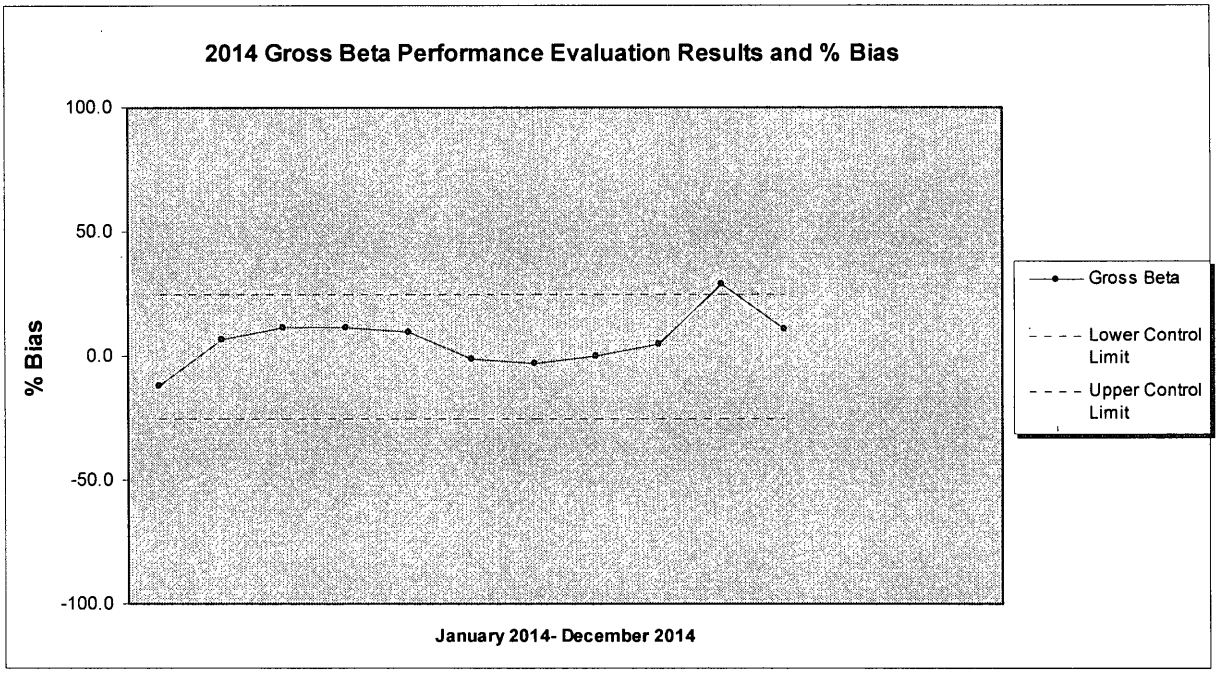

FIGURE 7

IODINE-131 PERFORMANCE EVALUATION RESULTS AND % BIAS

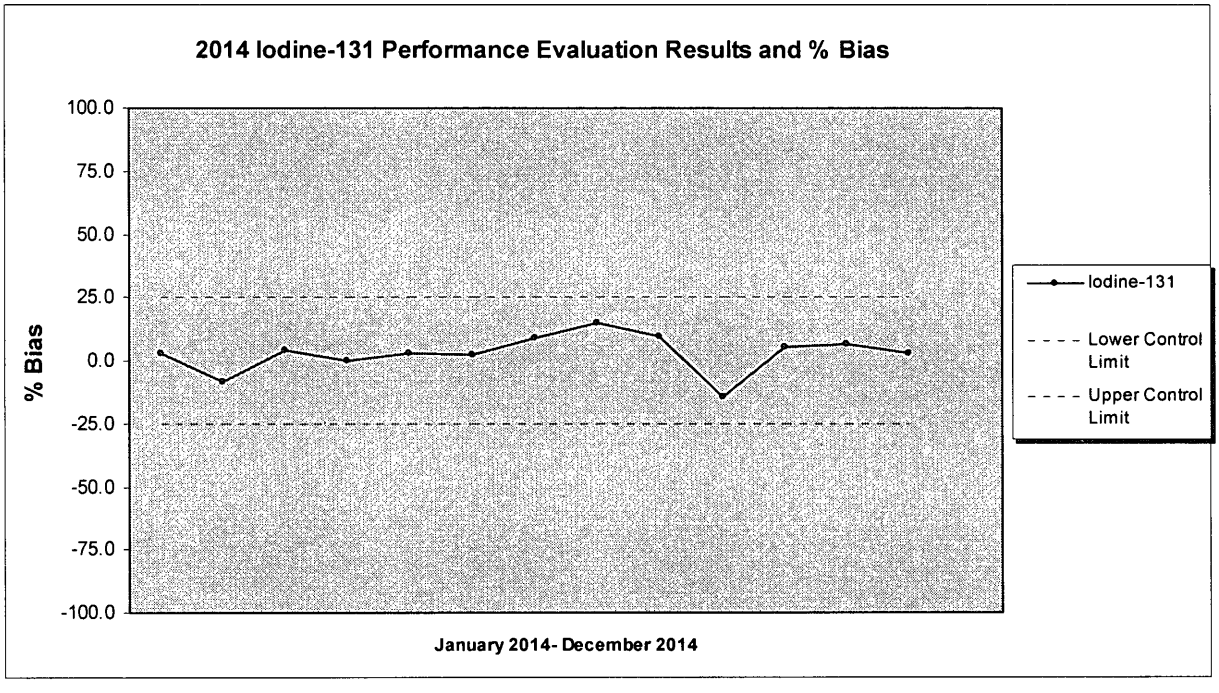

FIGURE 8

AMERICIUM-241 PERFORMANCE EVALUATION RESULTS AND % BIAS

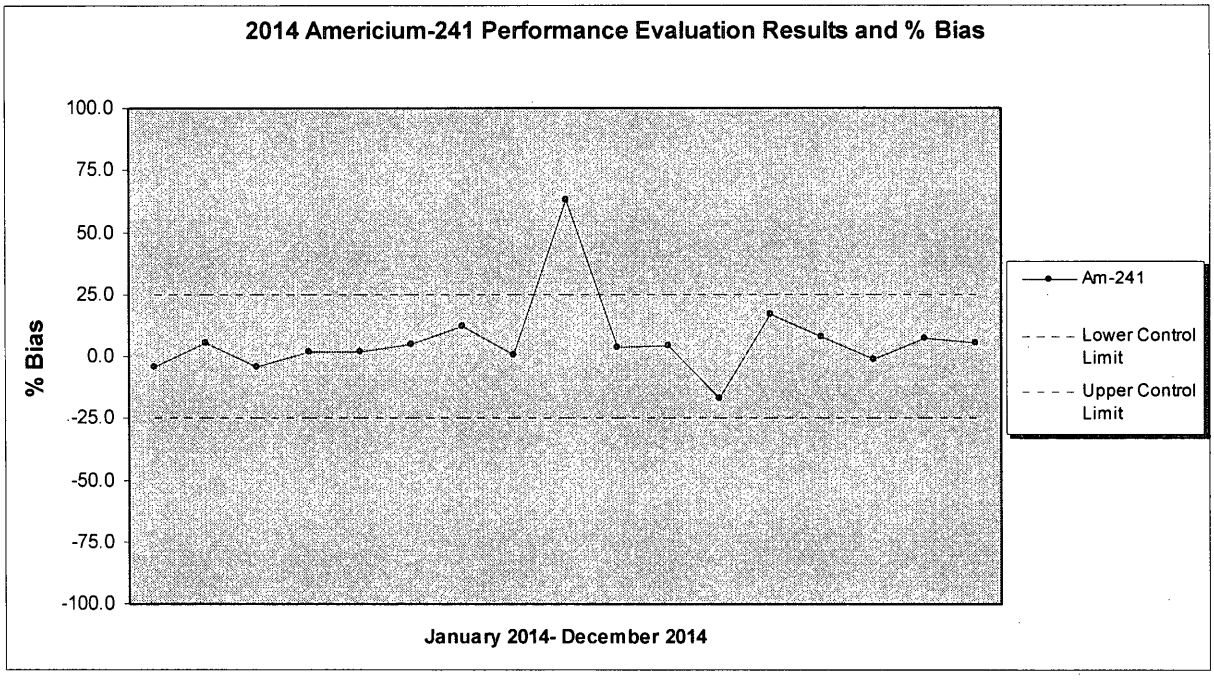

FIGURE 9

PLUTONIUM-238 PERFORMANCE EVALUATION RESULTS AND % BIAS

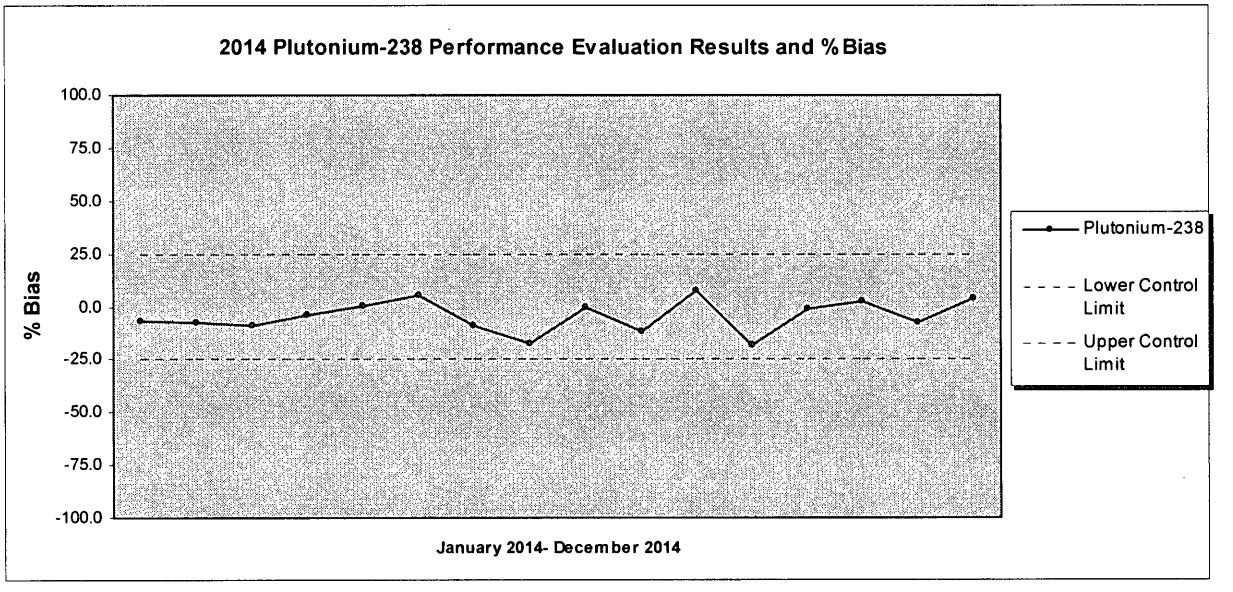

TABLE 6

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

REMP 2014	Bias Criteria (+ / - 25%		Precision Criteria (Note 1)	
	WITHIN CRITERIA	OUTSIDE CRITERIA	WITHIN CRITERIA	OUTSIDE CRITERIA
MILK				
Gas Flow Sr 2nd count	36	0	36	0
Gas Flow Total Strontium	23	0	23	0
Gamma Spec Liquid RAD A-013 with Ba, La	48	0	109	0
SOLID				
LSC Iron-55	3	0	3	0
Gamma Spec Solid RAD A-013	30	0	43	0
LSC Nickel 63	3	0	3	0
Gas Flow Sr 2nd count	5	0	5	0
Gas Flow Total Strontium	5	0	5	0
Gamma Spec Solid RAD A-013 with Ba, La	2	0	8	0
Gamma Spec Solid RAD A-013 with Iodine	6	0	7	0
FILTER				
Gas Flow Sr 2nd Count	5	0	5	0
Gross A & B	429	0	429	0
Gas Flow Sr-90	1	0	1	0
Gamma Spec Filter	45	0	47	0
LIQUID				
Alpha Spec Uranium	1	0	2	0
Tritium	206	0	205	0
Plutonium	1	0	1	0
LSC Iron-55	12	0	12	0
LSC Nickel 63	13	0	13	0
Gamma Spec Liquid RAD A-013	4	0	4	0
Alpha Spec Am243	6	0	6	0
Gamma Iodine-131	28	0	28	0
Alpha Spec Plutonium	10	0	10	0
Gas Flow Sr 2nd count	15	0	15	0
Alpha Spec Am241 Curium	8	0	8	0
Gas Flow Total Strontium	30	0	31	0
Gross Alpha Non Vol Beta	45	0	45	0
Gamma Spec Liquid RAD A-013 with Ba, La	84	0	159	0
Gamma Spec Liquid RAD A-013 with Iodine	40	0	40	0
TISSUE				
Gamma Spec Solid RAD A-013	48	0	46	0
Gas Flow Sr 2nd count	8	0	8	0
Gas Flow Total Strontium	17	0	17	0
Gamma Spec Solid RAD A-013 with Ba, La	10	0	10	0

Gamma Spec Solid RAD A-013 with Iodine	23	0	22	0
SEA WATER				
LSC Iron-55	5	0	6	0
LSC Nickel 63	5	0	6	0
Gas Flow Total Strontium	6	0	6	0
Gross Alpha Non Vol Beta	6	0	6	0
Gamma Spec Liquid RAD A-013 with Iodine	7	0	11	0
VEGETATION				
Gas Flow Sr 2nd count	10	0	10	0
Gamma Spec Solid RAD A-013 with Iodine	86	0	96	0
AIR CHARCOAL				
Gamma Iodine 131 RAD A-013	560	0	606	0
Carbon-14 (Ascarite/Soda Lime Filter per Liter)	28	0	28	0
DRINKING WATER				
Tritium	39	0	40	0
LSC Iron-55	17	0	16	0
LSC Nickel 63	16	0	15	0
Gamma Iodine-131	27	0	26	0
Gas Flow Sr 2nd count	12	0	12	0
Gas Flow Total Strontium	19	0	18	0
Gross Alpha Non Vol Beta	72	0	73	0
Gamma Spec Liquid RAD A-013 with Ba, La	35	0	75	0
Total	**2200**		**2456**	

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:

Total Radiological 2014	Bias Criteria (+ / - 25%		Precision Criteria (Note 1)	
	WITHIN CRITERIA	OUTSIDE CRITERIA	WITHIN CRITERIA	OUTSIDE CRITERIA
MILK				
Gamma Iodine-129	0	0	1	0
Gamma Iodine-131	36	0	110	0
Gas Flow Sr 2nd count	36	0	36	0
Gas Flow Strontium 90	5	0	5	0
Gas Flow Total Strontium	23	0	23	0
Gamma Spec Liquid RAD A-013 with Ba, La	48	0	109	0
Gamma Spec Liquid RAD A-013 with Iodine	3	0	4	0
SOLID				
Gamma Percent Leach	5	0	0	0
Gas Flow Radium 228	16	0	20	0
Tritium	211	0	247	0
Tritium by Combustion	1	0	1	0
Carbon-14	130	0	181	0
LSC Iron-55	103	0	121	0
Alpha Spec Polonium Solid	52	0	54	0
Gamma Nickel 59 RAD A-022	99	0	117	0
LSC Chlorine-36 in Solids	4	0	4	0
Gamma Spec Ra226 RAD A-013	21	0	24	0
Gamma Spec Solid RAD A-013	649	0	812	0
LSC Nickel 63	141	0	154	0
LSC Plutonium	181	0	202	0
Technetium-99	224	0	250	0
Gamma Spec Liquid RAD A-013	2	0	2	0
ICP-MS Technetium-99 in Soil	61	0	60	0
LSC Selenium 79	11	0	11	0
Total Activity,	4	0	4	0
Tritium	16	0	17	0
Alpha Spec Am243	23	0	37	0
Gamma Iodine-129	100	0	120	0
Gas Flow Lead 210	6	0	6	0
Total Uranium KPA	7	0	10	0
Alpha Spec Uranium	214	0	309	0
LSC Promethium 147	2	0	2	0
LSC, Rapid Strontium 89 and 90	42	0	61	0
Alpha Spec Thorium	152	0	196	0
ICP-MS Uranium-233, 234 in Solid	49	0	47	0
Alpha Spec Plutonium	231	0	240	0
ICP-MS Technetium-99 Prep in Soil	62	0	61	0
Alpha Spec Neptunium	213	0	237	0
Alpha Spec Plutonium	158	0	206	0
Gamma Spec Solid with Ra226, Ra228	9	0	13	0

Gas Flow Sr 2nd count	21	0	25	0
Gas Flow Strontium 90	195	0	201	0
Gas Flow Total Radium	2	0	3	0
Lucas Cell Radium 226	38	0	47	0
Total Activity Screen	9	0	10	0
Alpha Spec Am241 Curium	304	0	339	0
Alpha Spec Total Uranium	4	0	8	0
Gas Flow Total Strontium	43	0	46	0
Gross Alpha Non Vol Beta	1	0	1	0
ICP-MS Uranium-233, 234 Prep in Solid	49	0	48	0
ICP-MS Uranium-235, 236, 238 in Solid	60	0	81	0
Gamma Spec Solid RAD A-013 with Ba, La	2	0	8	0
Gamma Spec Solid RAD A-013 with Iodine	6	0	7	0
GFC Chlorine-36 in Solids	3	0	3	0
Gamma Spec Solid RAD A-013 (pCi/Sample)	2	0	2	0
Tritium	8	0	8	0
Alpha Spec Am241 (pCi/Sample)	2	0	2	0
ICP-MS Uranium-234, 235, 236, 238 in Solid	148	0	132	0
ICP-MS Uranium-235, 236, 238 Prep in Solid	50	0	49	0
Alpha Spec Thorium	1	0	1	0
Alpha Spec Uranium	1	0	1	0
Gross Alpha/Beta	235	0	316	3
Alpha Spec Neptunium	1	0	1	0
Gas Flow Sr 2nd count	2	0	1	0
Gross Alpha/Beta (Americium Calibration) Solid	2	0	3	0
ICP-MS Uranium-234, 235, 236, 238 Prep in Solid	69	0	65	0
FILTER				
Alpha Spec Uranium	14	0	18	0
Alpha Spec Polonium	1	0	5	0
Gamma I-131, filter	4	0	4	0
LSC Plutonium Filter	84	0	102	0
Tritium	76	0	112	0
Carbon-14	35	0	66	0
Nickel-63	0	0	8	0
LSC Iron-55	69	0	84	0
Gamma Nickel 59 RAD A-022	55	0	68	0
LSC Nickel 63	60	0	78	0
Technetium-99	51	0	75	0
Gamma Spec Filter RAD A-013	143	0	174	6
Alphaspec Np Filter per Liter	8	0	13	0
Alphaspec Pu Filter per Liter	11	0	22	0
Gamma Iodine-125	5	0	0	0
Gamma Iodine-129	46	0	60	0
Gross Alpha/Beta	5	0	5	0
Alpha Spec Am243	10	0	28	0
Gas Flow Lead 210	0	0	4	0
LSC Plutonium Filter per Liter	9	0	15	0
Total Uranium KPA	9	0	14	0

Alpha Spec Uranium	55	0	96	0
LSC Promethium 147	1	0	2	0
LSC, Rapid Strontium 89 and 90	72	0	94	0
Alpha Spec Thorium	42	0	66	0
Gas Flow Radium 228	1	0	1	0
Alpha Spec Plutonium	81	0	98	0
ICP-MS Uranium-233, 234 in Filter	0	0	3	0
Alpha Spec Neptunium	62	0	83	0
Alpha Spec Plutonium	66	0	96	0
Alpha Spec Polonium,(Filter/Liter)	0	0	14	0
Alpha Spec Radium 226	0	0	2	0
Gas Flow Sr 2nd Count	72	0	81	1
Gas Flow Strontium 90	61	0	68	0
Lucas Cell Radium-226	1	0	1	0
Alpha Spec Am241Curium	95	0	117	0
Gas Flow Total Strontium	5	0	5	0
ICP-MS Uranium-233, 234 Prep in Filter	0	0	3	0
ICP-MS Uranium-235, 236, 238 in Filter	0	0	6	0
Total Activity in Filter,	1	0	10	0
Alphaspec Am241 Curium Filter per Liter	15	0	20	0
Tritium	86	0	89	0
Gamma Spec Filter RAD A-013 Direct Count	6	0	6	0
Carbon-14	12	0	12	0
GFC Chlorine-36 in Filters PL	1	0	1	0
Direct Count-Gross Alpha/Beta	48	0	1	0
Gross Alpha/Beta	48	0	60	0
ICP-MS Uranium-234, 235, 236, 238 in Filter	4	0	6	0
ICP-MS Uranium-235, 236, 238 Prep in Filter	0	0	3	0
Alpha Spec U	13	0	35	0
Gross A & B	497	0	473	0
LSC Iron-55	8	0	19	0
Technetium-99	7	0	13	0
Gas Flow Sr-90	6	0	13	0
LSC Nickel 63	14	0	19	0
Gas Flow Pb-210	8	0	22	0
Gas Flow Ra-228	5	0	10	0
Gamma Iodine 129	8	0	8	0
ICP-MS Uranium-234, 235, 236, 238 Prep in Filter	2	0	3	0
Gamma Spec Filter	97	0	117	0
Lucas Cell Ra-226	8	0	23	0
Alpha Spec Thorium	7	0	22	0
LIQUID				
Alpha Spec Uranium	390	0	553	0
Alpha Spec Polonium	4	0	7	0
Electrolytic Tritium	14	0	25	0
Tritium	1125	0	1177	0
Carbon-14	149	0	161	0

Plutonium	43	0	63	0
Iodine-131	3	0	4	0
LSC Iron-55	192	0	233	0
Gamma Nickel 59 RAD A-022	18	0	21	0
Gamma Iodine 131 RAD A-013	2	0	2	0
Gamma Radium 228 RAD A-013	3	0	3	0
LSC Nickel 63	209	0	236	0
LSC Radon 222	18	0	21	0
Technetium-99	377	0	425	0
Gamma Spec Liquid RAD A-013	702	0	732	0
Alpha Spec Total U RAD A-011	31	0	56	0
LSC Selenium 79	2	0	2	0
Alpha Spec Am243	17	0	18	0
Gamma Iodine-129	80	0	92	0
Gamma Iodine-131	28	0	28	0
ICP-MS Technetium-99 in Water	8	0	31	0
Gas Flow Lead 210	19	0	19	0
Total Uranium KPA	101	0	203	0
LSC Promethium 147	4	0	4	0
LSC, Rapid Strontium 89 and 90	7	0	8	0
Alpha Spec Thorium	145	0	186	0
Gas Flow Radium 228	171	0	206	0
Gas Flow Radium 228	40	0	37	0
Gas Flow Radium 228	1	0	1	0
Alpha Spec Plutonium	288	0	387	0
LSC Sulfur 35	1	0	1	0
Alpha Spec Neptunium	90	0	141	0
Alpha Spec Plutonium	21	0	49	0
Alpha Spec Radium 226	7	0	7	0
Gas Flow Sr 2nd count	191	0	199	0
Gas Flow Strontium 90	365	0	422	0
Gas Flow Strontium 90	1	0	1	0
Gas Flow Total Radium	78	0	103	0
ICP-MS Technetium-99 Prep in Water	8	0	32	0
ICP-MS Uranium-233, 234 in Liquid	6	0	11	0
LSC Calcuim 45	1	0	1	0
Lucas Cell Radium 226	310	0	366	0
Lucas Cell Radium-226	10	0	10	0
Total Activity Screen	7	0	7	0
Chlorine-36 in Liquids	13	0	14	0
Alpha Spec Am241 Curium	217	0	333	0
Gas Flow Total Strontium	112	0	116	0
Gross Alpha Non Vol Beta	980	0	1167	0
LSC Phosphorus-32	2	0	3	0
Lucas Cell Radium 226 by Method Ra-04	2	0	2	0
ICP-MS Uranium-233, 234 Prep in Liquid	6	0	11	0
Tritium in Drinking Water by EPA 906.0	9	0	12	0
Gamma Spec Liquid RAD A-013 with Ba, La	84	0	159	0
Gamma Spec Liquid RAD A-013 with Iodine	162	0	189	0

Gas Flow Strontium 89 & 90	5	0	3	0
ICP-MS Uranium-235, 236, 238 in Liquid	10	0	18	0
Gas Flow Total Alpha Radium	6	0	7	0
Gross Alpha Co-precipitation	3	0	13	0
ICP-MS Uranium-235, 236, 238 Prep in Liquid	6	0	11	0
ICP-MS Uranium-234, 235, 236, 238 in Liquid	31	0	74	0
Gross Alpha Beta (Americium Calibration) Liquid	32	0	46	0
ICP-MS Uranium-234, 235, 236, 238 Prep in Liquid	15	0	38	0
Alpha/Beta (Americium Calibration) Drinking Water	23	0	18	0
TISSUE				
Carbon-14	3	0	3	0
Gamma Spec Solid RAD A-013	76	0	78	0
Technetium-99	4	0	4	0
Tritium	1	0	1	0
Alpha Spec Uranium	5	0	8	0
Alpha Spec Plutonium	5	0	10	0
Gas Flow Sr 2nd count	8	0	8	0
Gas Flow Strontium 90	11	0	12	0
Alpha Spec Am241 Curium	2	0	2	0
Gas Flow Total Strontium	17	0	17	0
Gamma Spec Solid RAD A-013 with Ba, La	10	0	10	0
Gamma Spec Solid RAD A-013 with Iodine	23	0	22	0
Gross Alpha/Beta	2	0	2	0
SEA WATER				
LSC Iron-55	5	0	6	0
LSC Nickel 63	5	0	6	0
Gas Flow Total Strontium	6	0	6	0
Gross Alpha Non Vol Beta	6	0	6	0
Gamma Spec Liquid RAD A-013 with Iodine	7	0	11	0
VEGETATION				
LSC Iron-55	2	0	2	0
Gamma Nickel 59 RAD A-022	1	0	0	0
Gamma Spec Solid RAD A-013	26	0	25	0
LSC Nickel 63	2	0	1	0
LSC Plutonium	1	0	1	0
Technetium-99	4	0	3	0
Tritium	11	0	11	0
Gamma Iodine-129	1	0	0	0
Gas Flow Lead 210	2	0	3	0
Total Uranium KPA	4	0	4	0
Alpha Spec Uranium	22	0	22	0
Alpha Spec Thorium	5	0	5	0
Alpha Spec Plutonium	13	0	11	0
Alpha Spec Neptunium	1	0	1	0
Alpha Spec Plutonium	1	0	1	0
Gas Flow Sr 2nd count	10	0	10	0

Gas Flow Strontium 90	12	0	11	0
Gas Flow Total Radium	2	0	2	0
Alpha Spec Am241 Curium	6	0	6	0
Gamma Spec Solid RAD A-013 with Iodine	86	0	96	0
Gamma Spec Solid RAD A-013 (pCi/Sample)	2	0	2	0
Alpha Spec Am241 (pCi/Sample)	1	0	2	0
ICP-MS Uranium-234, 235, 236, 238 in Solid	12	0	7	0
Alpha Spec Uranium	0	0	2	0
Gross Alpha/Beta	7	0	9	0
Alpha Spec Plutonium	0	0	2	0
Gas Flow Strontium 90	4	0	2	0
ICP-MS Uranium-234, 235, 236, 238 Prep in Solid	7	0	4	0
AIR CHARCOAL				
Gamma Iodine 131 RAD A-013	560	0	606	0
Gamma Iodine-129	7	0	6	0
Carbon-14	7	0	7	0
Carbon-14 (Ascarite/Soda Lime Filter per Liter)	28	0	28	0
Gamma Iodine 129	7	0	7	0
Gamma Spec Filter	7	0	7	0
DRINKING WATER				
Alpha Spec Uranium	4	0	5	0
Alpha Spec Polonium	1	0	25	0
Tritium	39	0	40	0
Carbon-14	3	0	2	0
Iodine-131	2	0	2	0
LSC Iron-55	17	0	16	0
LSC Nickel 63	16	0	15	0
LSC Radon 222	13	0	13	0
Technetium-99	2	0	1	0
Gamma Spec Liquid RAD A-013	17	0	18	0
Gamma Iodine-129	2	0	4	0
Gamma Iodine-131	27	0	26	0
Gas Flow Lead 210	4	0	3	0
Total Uranium KPA	17	0	34	0
Alpha Spec Thorium	1	0	1	0
Gas Flow Radium 228	22	0	26	0
Alpha Spec Plutonium	3	0	3	0
Gas Flow Sr 2nd count	12	0	12	0
Gas Flow Strontium 90	20	0	22	0
LSC Calcuim 45	2	0	2	0
Lucas Cell Radium-226	23	0	49	0
Alpha Spec Am241 Curium	2	0	2	0
Gas Flow Total Strontium	19	0	18	0
Gross Alpha Non Vol Beta	247	0	214	0
Tritium in Drinking Water by EPA 906.0	28	0	26	0
Gamma Spec Liquid RAD A-013 with Ba, La	35	0	75	0
Gas Flow Strontium 89 & 90	17	0	11	0
Gas Flow Total Alpha Radium	1	0	1	0

Gross Alpha Co-precipitation	99	0	91	0
Alpha/Beta (Americium Calibration) Drinking Water	16	0	16	0
ECLS-R-GA NJ 48 Hr Rapid Gross Alpha	7	0	7	0
Total	**16535**		**19734**	

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

2014 CORRECTIVE ACTION REPORT SUMMARY

CORRECTIVE ACTION ID# & PE FAILURE	DISPOSITION
CARR140605-879 ISO Documentation of PT Failures in MAPEP-14-RdV30 for Uranium 235 in Vegetation by ICP/MS and 14-MaS30 Uranium-233/234 and Uranium 238 by Alpha Spec.	**Root Cause Analysis of MAPEP-14-RdV28 in vegetation for Uranium-235 by ICP/MS** The root cause of this failure was human error and inattention to detail. The QAO inadvertently entered the incorrect activity for this parameter when she was entering the results on the MAPEP website. 0.261 ug/sample instead of 0.0261 ug/sample was entered. The data entry error was not caught during the GL review process. MAPEP results only are peer reviewed by the GL of the applicable area to ensure that the data was entered correctly. **A second PT was successfully analyzed for this matrix.** **Uranium-234/233, and Uranium-238 in soil by Alpha Spec:** 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 incomplete sample digestion. A total digestion technique using Hydrofluoric Acid was performed on the sample. However, this digestion was not vigorous enough to extract all the U-234 and U-238 from the soil because the analytes were fused into the soil at an extremely high temperature. Due to the high number of labs that received a Not Acceptable rating for this analysis, MAPEP has posted an explanation on the preparation of the Uranium Soil standard on their website. **Permanent Corrective/Preventive Actions or Improvements** : Upon notification of the failure, the sample was re-digested using a Sodium Hydroxide fusion method prior to ion-exchange separation chemistry. The results for both the U-234 and U-238 fall within acceptable range. In the future, all MAPEP soil samples will be analyzed with a NaOH fusion dissolution technique. Our analytical procedures provide the flexibility to perform different extraction techniques (leaching,

	HF dissolution) based on client requests. For our DOE clients, complete dissolution using HF has been the approved method for Uranium. Some clients also ask for the Uranium analysis using a leach procedure. In all cases, GEL performs the required contractual procedure for the analysis. **A second PT was successfully analyzed for this matrix.**
CARR140520-874 ISO Documentation of PT Failures in –MRAD-20 for Americium-241 in water.	**Root Cause Analysis** After a thorough review of all data, a definite reason for the failure could not be determined. The following steps were taken to prove that this elevated 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 recoveries in the Laboratory Control Sample (LCS) recovered at 98.2%. Two sample duplicates were also prepared in the batch. The RPDs were 4.8 and 8.6. 2. The sample was re-analyzed in duplicate after the report was received. One with our normal Am-243 tracer, and another with Cm-244 tracer. Both of the reanalysis confirm the original reported result (which is outside the range of acceptable results). Control charts for all Am tracer recoveries were also reviewed to determine if there may be an issue with the tracers. While there is a slight bias in the average LCS recovery, it was not significant enough to consider abnormal, and did not come close to accounting for the high result on this analysis. Additionally, since the sample was reanalyzed using two different tracers and achieved the same result, a tracer issue was ruled out as the potential culprit **Permanent Corrective/Preventive Actions or Improvements** : The laboratory must assume unidentified random error caused the elevated bias because all quality control criteria were met for the batch. Additionally, a well characterized performance evaluation sample from another vendor was prepped and analyzed a few weeks after this sample. The Am-241 recovered at 105% for this sample and fell well within its acceptance range. **A second PT was successfully analyzed for this matrix.**

CARR140825-902 For Failures of RAD-98 for Strontium-89 in Water	**Root Cause Analysis of Strontium-89 (Sr-89)** 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 103%. 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** The laboratory must assume an unidentified random error caused the high bias for this batch. While the LCS recovered outside to its acceptance range, the matrix spike (MS) recovery fell within both the acceptance range for the MS (80%-120%) and the acceptance range for the LCS (90%-110%). The result was also confirmed using Method LAB PBMS-A-004. The lab will continue to monitor the recoveries of this radionuclide to ensure that there are no issues. **A second PT was successfully analyzed for this matrix.**