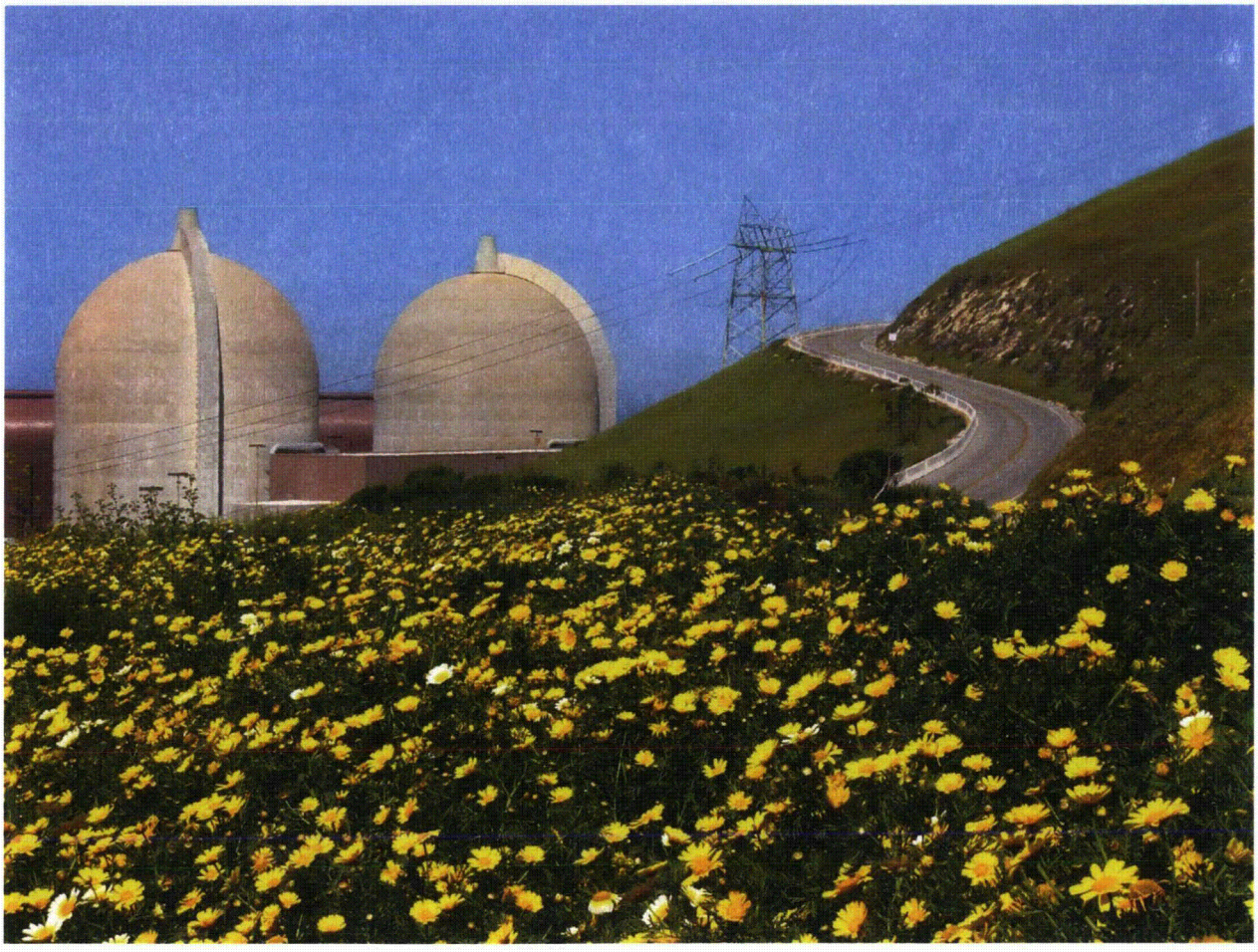
Enclosure
PG&E Letter DCL-12-041

2011 ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

2011 Annual Radiological Environmental Operating Report Diablo Canyon Power Plant

January 1, 2011 - December 31, 2011



Page Intentionally Blank

2011 Diablo Canyon Power Plant

ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT
(AREOR)
January 1, 2011 - December 31, 2011

Prepared By
Pacific Gas & Electric Company
Diablo Canyon Power Plant

Prepared by: Martin Wright Date: 4/16/12
Martin B. Wright, DCPP RP Senior Engineer

Reviewed & Approved by: Tim Irving Date: 4/17/12
Tim Irving, DCPP Radiation Protection Manager

PG&E Submittal Letter DCL-12-041

Page Intentionally Blank

EXECUTIVE SUMMARY

During the year 2011, a Radiological Environmental Monitoring Program (REMP) was conducted for the Diablo Canyon Power Plant (DCPP) to assess the levels of radiation or radioactivity in the environment. More than 1400 samples were collected (including TLDs) over the course of the monitoring period, with approximately 2300 radionuclide or exposure rate analyses performed.

This report contains results from the operational Radiological Environmental Monitoring Program (REMP) for Diablo Canyon Power Plant (DCPP) compiled for the period January 1, 2011 through December 31, 2011. This program was conducted in accordance with DCPP Program Directive CY2, "Radiological Monitoring and Controls Program," and RP1.ID11, "Environmental Radiological Monitoring Procedure."

The types of samples (matrix ID) collected for this monitoring period were as follows:

Air Particulate (AP)	Air Cartridges (AC) for iodide monitoring,		
Direct Radiation (TLD's)	Milk (MK)	Meat (MT)	Vegetation (VG)
Drinking Water (DW)	Ground Water (GW)	Surface Water (SW)	Aquatic Vegetation (AV)
Fish (FH)	Mussels (IM)	Sediment (SD)	Rain (ML)

Diablo Canyon REMP collected environmental samples and shipped them to General Engineering Labs (GEL) located in Charleston, South Carolina. All 2011 REMP environmental lab sample analyses were performed by GEL.

The ambient direct radiation levels in the DCPP offsite environs did not change and were within the preoperational range. Beginning in June 2009, DCPP began loading of the onsite Independent Spent Fuel Storage Installation (ISFSI). The ISFSI had no significant impact on the REMP TLD station readings in the vicinity of the site boundary and beyond. The ambient direct radiation levels within the DCPP plant site boundary near the ISFSI were elevated due to dry cask used fuel storage. An evaluation of direct radiation measurements and member of public occupancy times surrounding the ISFSI indicated all federal criteria for member of public dose limits were conservatively met.

Groundwater monitoring data was collected in accordance with the nuclear industry NEI 07-07 Groundwater Protection Initiative (August 2007). Concentrations of tritium were detected in three monitoring wells beneath the DCPP power block (OW1, OW2, and DY1). This tritium was attributed to rain-washout of gaseous tritium exiting the plant vent system (via an approved discharge path). It should be noted that studies of the DCPP site indicated that any groundwater (subsurface) flow beneath the DCPP power block was not used as a source of drinking water. Due to topography and site characteristics, this subsurface flow discharged into the Pacific Ocean which is approximately 100 yards from the power block.

An Old Steam Generator Storage Facility (OSGSF) long term storage mausoleum was constructed within the DCPP site boundary in 2007 for storage of eight retired DCPP steam generators and two retired DCPP reactor heads. This equipment was placed into this OSGSF on the following dates:

- March 2008 (outage 2R14), four DCPP Unit Two (U-2) Steam Generators
- February 2009 (outage 1R15), four DCPP Unit One (U-1) Steam Generators
- November 2009 (outage 2R15), one DCPP Unit Two (U-2) Reactor (Rx) Head
- October 2010 (outage 1R16), one DCPP Unit One (U-1) Rx Head

This OSGSF did not cause any changes to the ambient direct radiation levels within the DCPP environs during 2011.

The OSGSF sumps were inspected quarterly by REMP personnel. Rainwater in-leakage was found within the OSGSF sumps during the first quarter of 2011. This rainwater had tritium concentrations of 2,000 to 34,000 pCi/Liter due to diffusion of tritium from the stored equipment into the sump rainwater. The rainwater from the sump was removed and processed via an approved radwaste discharge pathway. Subsequent construction repairs to the OSGSF have prevented rainwater from entering the OSGSF throughout the remainder of 2011. These sumps have remained dry.

The results of the 2011 REMP showed no unusual findings from DCPP site operations. These results were also compared to preoperational data and showed no unusual trends.

On March 11th, 2011 the Tohoku earthquake (magnitude 9.0 M_W) and tsunami struck the east coast of Japan. The tsunami associated with this event caused nuclear accidents at the Dai-Ichi Nuclear Power Station in Fukushima Prefecture, Japan. Isotopic releases occurred in Japan and were carried by the jet stream to the west coast of the United States. The DCPP REMP initiated numerous supplemental sampling to establish Fukushima contributions to DCPP isotopic background concentrations. These

Fukushima isotopes were eventually detected by the DCPP REMP beginning on March 17th, 2011. The primary isotopes detected by the DCPP REMP were I-131, I-132, Te-132, Cs-134, and Cs-137. Airborne concentrations were detected from March 17th thru April 20th. The DCPP REMP continued to detect cesium within milk, vegetation, and meat throughout the end of 2011. Additional discussion on Fukushima isotopes is found within Section 4.5 of this report.

Diablo Canyon site operations had no significant radiological impact on airborne, surface water, drinking water, marine life, aquatic vegetation, terrestrial vegetation, milk, or meat radioactivity in the environment.

Page Intentionally Blank

TABLE OF CONTENTS

LIST OF TABLES

LIST OF FIGURES

Page Intentionally Blank

1.0 INTRODUCTION

Diablo Canyon Power Plant (DCPP) consists of two Westinghouse pressurized water reactors. Unit 1 began commercial operation in 1985, and Unit 2 began commercial operation in 1986.

Radiological Environmental Monitoring Program (REMP) samples were collected by DCPP REMP personnel and sent to General Engineering Labs in Charleston, South Carolina for analysis. Fish (except market fish) and ocean sediment samples were collected by contract divers of Tenera Environmental and given to DCPP REMP personnel for shipment to GEL. Market fish samples were collected by local commercial fishermen and then purchased by DCPP REMP personnel in one of two local fish markets for shipment to GEL. Direct radiation analyses were conducted by DCPP REMP personnel and analyzed by the DCPP Thermoluminescent Dosimeter (TLD) Lab.

DCPP sent replicate samples of milk (5F2), drinking water (DW1), outfall water (OUT), Diablo Creek (5S2), vegetative crops (7G1), fish (DCM), sediment (DCM), and kelp (DCM) to the California Department of Public Health (CDPH) Radiological Health Branch as part of a State cross check program. Other pathways monitored independently by the CDPH were direct radiation (TLDs) and air sampling. Additional split sampling was conducted post Fukushima Japan, Dai-Ichi NPS accident time frame.

This report summarizes the quarterly findings of the Radiological Environmental Monitoring Program (REMP) conducted by Diablo Canyon Power Plant. The remainder of this report is organized as follows:

Section 2: Provides a description of the overall REMP design. Included is a summary of the requirements for REMP sampling and tables listing routine sampling and TLD monitoring locations with distances from the plant. Tables listing Lower Limit of Detection requirements and Reporting Levels (NRC notification if levels exceeded) are also included.

Section 3: Consists of the summarized data as required by the Radiological Environmental Monitoring Program. The summaries are provided similar to that specified by the NRC Branch Technical Position on Environmental Monitoring.

Section 4: Provides a summary of the results for the samples collected. The performance of the program in meeting the requirements is discussed, and the data acquired during the monitoring period is analyzed. Also included is environmental TLD preoperational data trending.

Section 5: Provides a summary of groundwater monitoring in accordance with the nuclear industry NEI 07-07 Groundwater Protection Initiative (August 2007).

2.0 PROGRAM DESIGN

The Radiological Environmental Monitoring Program (REMP) for the Diablo Canyon Power Plant (DCPP) was designed with the following specific objectives in mind. These objectives continue to be in force, to varying degrees, throughout facility operation.

- To provide an early indication of the appearance or accumulation of any radioactive material in the environment caused by facility operation. Preoperational data is also used in this comparison.

- To provide assurance to regulatory agencies and the public that the station's environmental impact is known and within anticipated limits.

- To provide standby monitoring capability for rapid assessment of risk to the general public in the event of unanticipated or accidental releases of radioactive material.

The environmental media selected were based on the critical dose pathways of the radionuclides from the environment to man. They included the following: direct radiation, air, water, fish, ocean sediment, and invertebrates. Supplemental samples such as algae, kelp, local agricultural crops, recreational beach sand, groundwater, meat, and milk were also collected. The sampling locations were determined by land use, site meteorology, and local demographics. Guidance for this monitoring program is provided by the Radiological Assessment Branch Technical Position on Radiological Environmental Monitoring, Revision 1, November 1979

The detailed sampling requirements of the REMP are given in Table 2.1 of this report. Summaries of REMP sampling for the period are shown in Appendix A of this report. Direct dose (environmental TLDs) results are shown in Appendix B of this report. The REMP sample isotopic results are shown in Appendix C of this report. Any deviations from the REMP sampling schedule / requirements are documented in section 4.0 of this report.

2.1 MONITORING ZONES

The REMP was designed to allow comparison of levels of radioactivity in samples from the areas possibly influenced by DCPP to levels found in areas not influenced by the facility operations. Areas with the potential to be influenced by facility operations are called "indicator" stations. Areas with sufficient distance from the plant that are not likely to be influenced by facility operations are called the "control" stations. The distinction between the two zones is based on distance and relative direction from the plant. Analysis of survey data from the two zones aided in determination of site environmental influence. It also helped in differentiation between radioactive releases and seasonal variations in the natural environmental background.

2.2 PATHWAYS MONITORED

Direct Radiation
Airborne Radioactivity
Waterborne Pathways
Marine Biological, Beach Sand, and Ocean Sediment
Food Crops
Milk
Meat

2.3 DESCRIPTIONS OF REMP MONITORING

2.3.1 Direct Radiation

Direct ambient radiation was measured at 31 stations in the vicinity of DCPP using Panasonic UD814 TLD badges. The TLD badges had valid element correction factors (ECF), were calibrated using a NIST-traceable cesium-137 source, were annealed prior to placement, and were sealed in watertight packaging. Three badges were placed at each station each quarter. These badges were replaced on a quarterly basis.

Direct ambient radiation was measured at 8 stations in the vicinity of the ISFSI using Panasonic UD814 TLD badges. The TLD badges had valid element correction factors (ECF), were calibrated using a NIST-traceable cesium-137 source, were annealed prior to placement, and were sealed in watertight packaging. Three badges were placed at each station each quarter. These badges were replaced on a quarterly basis.

The field TLD badge packets were prepared and processed by DCPP personnel and the DCPP TLD Lab. Control badges were carried with the field badges to measure any dose received during transit. The location, date, and time of exchange were recorded on a log sheet which accompanied the field badges. The net exposure was reported over a standard 90 day quarter.

DCPP Environmental TLD standard quarter results are measurements of all environmental gamma radiation sources (cosmic, terrestrial, radon, etc) at each station during the deployment period. Transient and lab storage background dose contributions were subtracted prior to reporting.

2.3.2 Airborne Radioactivity

Air particulate and radioiodine sampling were performed weekly at six indicator stations: MT1, 0S2, 1S1, 7D1, 8S1 and 8S2. Air particulate and radioiodine sampling was performed weekly at one control station: 5F1.

Constant flow air samplers were used to draw air through paper filters to collect air particulates and through triethylenediamine (TEDA) impregnated charcoal cartridges to collect radioiodine. The air samplers were set at a flow rate of 1.5 standard cubic feet per minute. The air samplers were located approximately one meter above the ground. The sample volumes were determined by F&J Corporation model DF-1 flowmeters (corrected to standard temperature and pressure, STP) which were installed downstream of the sample head. At the end of the sampling period (weekly), the filter and cartridge were collected. All necessary data regarding the air volume readings, flowrate, sampler time on / off, date of collection, and sampler location were recorded and submitted to GEL along with the samples for analysis.

Approximately 72 hours after sampling (to allow for radon and thoron daughter decay), the filter papers collected from the field were placed on individual planchets and counted for gross beta activity in a low background, thin window gas proportional counter. Gamma isotopic analysis was then performed on quarterly composites of the filters (by station) to determine the activity concentration of gamma emitting isotopes. The quarterly composite is reported at the midpoint of the quarter monitored.

The TEDA impregnated charcoal cartridges were counted for each weekly station sampling period for gamma isotopic analyses to determine the radioiodine concentration.

2.3.3 Waterborne

Water samples (drinking water, surface water, monitor wells, and groundwater) were collected at the frequencies shown in Table 2.1

Ocean surface water samples were collected at Diablo Cove (station DCM), Rattlesnake Canyon (station 7C2), and at the plant Outfall (station OUT).

Drinking water samples were collected from Diablo Creek Weir (station 5S2), Diablo Creek Outlet (station WN2), Blanchard Spring (station 1A2), and from the DCPP drinking water system (station DW1). Drinking water was also collected from a control station located in San Luis Obispo at the Offsite Emergency Lab (station OEL).

Supplemental groundwater samples were collected from Water Well 02 (WW2) and DCSF96-1 (8S3).

Supplemental onsite monitoring well samples were collected from Observation Well 01 (OW1), Observation Well 02 (OW2), and a french drain system labeled Drywell 115 (DY1). These shallow wells were located in close proximity to the facility power block structures and within the protected area.

After collection, the samples were securely sealed and labeled with sample type, station ID, date, time of collection, person performing the collection and sent to GEL for analysis.

2.3.4 Marine Biological, Beach Sand, and Ocean Sediment

The REMP required sampling of rockfish (family Sebastes), perch (family Embiotocidae), mussels (family Mytilus), and ocean sediment from indicator station DCM and control station 7C2. All other marine samples collected were considered supplemental. These supplemental marine samples included the following: intertidal algae, intertidal mussels, kelp, and market fish. The intertidal samples were collected by DCPP personnel during low tidal conditions. Kelp was collected quarterly by DCPP personnel from the offshore kelp bed in the vicinity of the plant. Quarterly samples of fish and an annual sample of ocean sediments were collected from the plant environs by contracted divers (TENERA Environmental). The Tenera divers fillet the fish and leave a small portion of skin for identification. Beach sand was collected by DCPP personnel between the high and low tide boundaries at nearby recreational beaches. Fish caught locally by commercial fishermen were purchased from two local fish markets (Avila Beach Pier-7D3 and Morro Bay-2F1).

All samples were subject to unavailability due to seasonal fluctuations or unfavorable sampling conditions. The above samples were sealed in plastic bags immediately upon collection. Mussels were sent to GEL in-shell where GEL personnel removed the meat & internal organs for analysis. Only edible portions of the fish were analyzed (fish fillets). The samples were labeled with sample type, station ID, date, time of collection, and the individual who performed collection. The samples were then frozen (to prevent spoilage odor) before they were sent to GEL for analysis.

2.3.5 Food Crops

The REMP required broadleaf food vegetation to be collected in the nearest off-site locations of the highest calculated annual average ground level D/Q (dispersion parameter) within 5 miles. There was no broadleaf food vegetation available that satisfied this requirement. Because these food products were unavailable, the DCPP REMP conducted additional air sampling in the SE (station 8S2) and NNW (station 1S1) sectors. Additional representative samples of food crops in season were collected monthly from supplemental stations: Cal Poly Farm (5F2), Kawaoka Farm in Arroyo Grande (7G1), Mello Farm (7C1) along the site access road, and quarterly household gardens (3C1 and 6C1).

The monthly samples (including 3C1) were collected by DCPP personnel and sealed immediately in plastic bags. The quarterly household garden sample (6C1) was provided to DCPP personnel by the land occupant (due to property access difficulty and privacy). The samples were labeled with sample type, station ID, collection date, collection time, and the individual who performed collection. The samples were normally frozen before they were sent to GEL for analysis (to prevent spoilage odor).

2.3.6 Milk

There were no animals within the vicinity of the plant that were utilized for milk consumption by humans. However, supplemental samples of cow milk were collected monthly from Cal Poly Farm (5F2) which was approximately 13 miles from DCPP. Two 1-gallon plastic containers of milk were collected each sampling period by DCPP personnel. Forty grams of sodium bio-sulfite preservative were added to each gallon of milk sample. The containers were sealed and shaken thoroughly to distribute the preservative. The containers were labeled with sample type, station ID, collection date, collection time, and the individual who performed collection. The samples were then express shipped to GEL for analysis.

2.3.7 Meat

A rancher routinely grazed cattle, goats, and sheep within three miles of the site boundary. These livestock meats were offered at local farmer's markets and private distribution. This meat commodity began at the end of 2007. REMP personnel obtained meat samples of each species directly from the land owner. Gamma spec and strontium analyses were performed on the meat.

Additional Fukushima Japan event meat sampling was conducted of Hearst Ranch meat which is located approximately 37 miles north of the DCPP site. This Hearst Ranch meat is free range, grass fed beef. This new REMP station code was HCM and provides a control location far from the site. REMP personnel purchased this Hearst Ranch meat directly from local grocery stores.

Property owners could hunt deer and wild pig (in season) within 5 miles of the site boundary. The REMP obtained one deer meat sample from these property owners. Gamma spec and strontium analyses were performed on the deer meat.

The meat was initially packaged by the livestock owners and turned over to REMP personnel. The packages were then separated by species and placed in large zip-lock bags. Each bag was labeled with sample type, station ID, collection date, collection time, and the individual who performed the collection. The samples were then frozen and sent to GEL for analysis.

TABLE 2.1:
Radiological Environmental Monitoring Program

Exposure Pathway and/or Sample Type	Number of Representative Samples and Sample Locations[1]	Sampling Stations	Collection Frequency	Type of Analysis	Required or Supplemental
1. Direct Radiation[2]	Thirty-one routine monitoring stations containing thermo luminescent dosimeters (TLDs) such that at least two (2) phosphors are present at each station, placed as follows:				
	An inner ring of stations, one in each terrestrial meteorological sector in the general area of the SITE BOUNDARY;	0S1, 0S2, WN1, 1S1, 2S1, 3S1, 4S1, 5S1, 6S1, 7S1, 8S1, 9S1, 8S2, 5S3, and MT1	Quarterly	Gamma Dose	Required
	An outer ring of stations, one in each terrestrial meteorological sector in the 2.5 to 12 km range from the site; and	1A1, 0B1, 1C1, 2D1, 3D1, 4C1, 5C1, 6D1, and 7C1	Quarterly	Gamma Dose	Required
	One or two areas to serve as control stations; and	4D1, 5F1	Quarterly	Gamma Dose	Required
	The balance of the stations to be placed in special interest areas such as population centers, nearby residences, or schools.	7D1, 7D2, 5F3, 7F1, and 7G2	Quarterly	Gamma Dose	Required
	A minimum of four stations around the ISFSI	IS1, IS2, IS3, IS4, IS5, IS6, IS7, IS8	Quarterly	Gamma Dose	Required
2. Airborne Radioiodine	Samples from $\geq$ 4 stations:				
	Three samples from close to the three SITE BOUNDARY locations (0S2, 8S1, & MT1) in different sectors.	MT1, 0S2, and 8S1	Continuous sampler operation with sample collection weekly, or more frequently if required by dust loading.	I-131 analysis	Required
	One sample from the vicinity of a community having the highest calculated annual average ground level D/Q.	7D1	Continuous sampler operation with sample collection weekly, or more frequently if required by dust loading.	I-131 analysis	Required
	If food products are unavailable, additional air sampling will be done in the NNW (station 1S1) and SE (Station 8S2) sectors.	1S1 & 8S2	Continuous sampler operation with sample collection weekly, or more frequently if required by dust loading.	I-131 analysis	Required
	One sample from a control location.	5F1	Continuous sampler operation with sample collection weekly, or more frequently if required by dust loading.	I-131 analysis	Required

Table 2.1 (continued)

Exposure Pathway and/or Sample Type	Number of Representative Samples and Sample Locations[1]	Sampling Stations	Collection Frequency	Type of Analysis	Required or Supplemental
3. Airborne Particulate	Samples from ≥ 4 stations:				
	Three samples from close to the three SITE BOUNDARY locations (0S2, 8S1, & MT1) in different sectors.	MT1, 0S2, and 8S1	Continuous sampler operation with sample collection weekly, or more frequently if required by dust loading.	Weekly gross beta radioactivity analysis following filter change[3]. Quarterly gamma isotopic analysis[4] of composite consisting of approx 12 filters (by location).	Required
	One sample from the vicinity of a community having the highest calculated annual average ground level D/Q.	7D1	Continuous sampler operation with sample collection weekly, or more frequently if required by dust loading.	Weekly gross beta radioactivity analysis following filter change[3]. Quarterly gamma isotopic analysis[4] of composite consisting of approx 12 filters (by location).	Required
	If food products are unavailable, additional air sampling will be done in the NNW (station 1S1) and SE (Station 8S2) sectors.	1S1 & 8S2	Continuous sampler operation with sample collection weekly, or more frequently if required by dust loading.	Weekly gross beta radioactivity analysis following filter change[3]. Quarterly gamma isotopic analysis[4] of composite consisting of approx 12 filters (by location).	Required
	One sample from a control location.	5F1	Continuous sampler operation with sample collection weekly, or more frequently if required by dust loading.	Weekly gross beta radioactivity analysis following filter change[3]. Quarterly gamma isotopic analysis[4] of composite consisting of approx 12 filters (by location).	Required
4. Waterborne					
a. Surface Ocean Water	One sample from the plant Outfall, Diablo Cove, and an area not influenced by plant discharge.	OUT, DCM, and 7C2	Monthly (grab sample)	Gamma isotopic[4] and tritium analysis.	Required
	One sample from the plant Outfall, Diablo Cove, and an area not influenced by plant discharge.	OUT, DCM, and 7C2	Quarterly (grab sample)	Gross Beta, Total Sr, Fe-55, and Ni-63	Supplemental

Table 2.1 (continued)

Exposure Pathway and/or Sample Type	Number of Representative Samples and Sample Locations[1]	Sampling Stations	Collection Frequency	Type of Analysis	Required or Supplemental
b. Drinking Water	One sample from the plant drinking water, one sample from Diablo Creek (upstream of plant), and one control sample.	DW1 and 5S2 OEL (control)	Monthly (grab sample)	Gamma isotopic[4], I-131, and tritium analysis.	Required
	One sample from the plant drinking water, one sample from Diablo Creek (upstream of plant), and one control sample.	DW1 and 5S2 OEL (control)	Quarterly (grab sample)	Gross Beta, Total Sr, Fe-55, and Ni-63	Supplemental
	One sample from Diablo Creek (downstream of plant) and one sample from Blanchard Spring.	WN2 and 1A2	Quarterly (grab sample)	Gamma isotopic[4], tritium, I-131, gross beta, Total Sr, Fe-55, and Ni-63	Supplemental
c. Groundwater	One sample from wells located under the plant power block.	OW1, OW2, and DY1	Quarterly (grab sample, when available)	Gamma isotopic[4], tritium, gross beta, Total Sr, Fe-55, and Ni-63	Supplemental
	One sample from a well located outside the plant power block (control sample).	WW2, 8S3	Quarterly (grab sample, when available)	Gamma isotopic[4], tritium, gross beta, Total Sr, Fe-55, and Ni-63	Supplemental
d. Sediment	One sample of offshore ocean sediment from Diablo Cove and Rattlesnake Canyon.	DCM and 7C2	Annual (grab sample)	Gamma isotopic[4]	Required
	One sample of offshore ocean sediment from Diablo Cove and Rattlesnake Canyon.	DCM and 7C2	Annual (grab sample)	Total Sr, Fe-55, and Ni-63	Supplemental
	One sample from each of five local recreational beaches.	AVA, MDO, PMO, CYA, and CBA	Semi- Annual (grab sample)	Gamma isotopic[4], Total Sr, Fe-55, and Ni-63	Supplemental
e. Marine Flora	One sample of kelp	DCM, PON, POS, and 7C2	Quarterly (when available)	Gamma isotopic[4]	Supplemental
	One sample of intertidal algae	DCM and 7C2	Quarterly (when available)	Gamma isotopic[4]	Supplemental

Table 2.1 (continued)

Exposure Pathway and/or Sample Type	Number of Representative Samples and Sample Locations[1]	Sampling Stations	Collection Frequency	Type of Analysis	Required or Supplemental
5. Ingestion					
a. Milk	Samples from milking animals in three locations within 5 km distance having the highest dose potential. If there are none, then one sample from milking animals in each of three areas between 5 to 8 km distance where doses are calculated to be greater than 1 mrem per year. One sample from milking animals at a control location 15 to 30 km distant and in the least prevalent wind direction. **NOTE:** The sample (5F2) should be taken monthly even if there are no indicator samples available.	5F2	Semimonthly when animals are on pasture; monthly at other times.	Gamma isotopic[4] and I-131 analysis.	Supplemental
b. Fish and Invertebrates	One sample of rock fish (family Sebastes) and one sample of perch (family Embiotocidae)	DCM and 7C2	Quarterly (grab sample)	Gamma isotopic[4] analysis on edible portions of each sample.	Required
	One sample of rock fish (family Sebastes) and one sample of perch (family Embiotocidae)	PON and POS	Quarterly (grab sample)	Gamma isotopic[4] analysis on edible portions of each sample.	Supplemental
	One sample of mussel (family Mytilus)	DCM and 7C2	Quarterly (grab sample)	Gamma isotopic[4] analysis on edible portions of each sample.	Required
	One sample of mussel (family Mytilus)	PON	Annual (grab sample)	Gamma isotopic[4] analysis on edible portions of each sample.	Supplemental
	One sample of mussel (family Mytilus)	POS	Quarterly (grab sample)	Gamma isotopic[4] analysis on edible portions of each sample.	Supplemental
	One sample of locally harvested market fish.	7D3 OR 2F1 (should alternate between locations)	Quarterly (grab sample)	Gamma isotopic[4] analysis on edible portions of each sample.	Supplemental

Table 2.1 (continued)

Exposure Pathway and/or Sample Type	Number of Representative Samples and Sample Locations[1]	Sampling Stations	Collection Frequency	Type of Analysis	Required or Supplemental
c. Broadleaf Vegetation[5]	Three samples of broadleaf vegetation grown nearest off-site locations of highest calculated annual average ground level D/Q IF milk sampling is not performed.		Monthly (when available)	Gamma isotopic[4] analysis (that includes I-131) on edible portion.	Required (see notation #5)
	One sample of each of the similar broadleaf vegetation grown 15 to 30 km distant in the least prevalent wind direction IF milk sampling is not performed.		Monthly (when available)	Gamma isotopic[4] analysis (that includes I-131) on edible portion.	Required (see notation #5)
d. Vegetative Crops	One sample of broadleaf vegetation or vegetables or fruit	5F2, 7C1, and 7G1	Monthly (when available)	Gamma isotopic[4] analysis on edible portion.	Supplemental
	One sample of broadleaf vegetation or vegetables or fruit.	3C1, 6C1	Quarterly (when available)	Gamma isotopic[4] analysis on edible portion.	Supplemental
e. Meat sample	One sample of each species (cow, goat, sheep, deer, or pig) of edible meat portion slaughtered for personal consumption (not mass market).	BCM, BGM, BSM, JDM, JPM, ACM, ADM, APM	Quarterly (as available and provided by land owners within 8 km of plant site)	Gamma isotopic[4] analysis, and Total Sr on edible portion.	Supplemental

Table Notations

1. Deviations are permitted from the required sampling schedule if specimens are unobtainable due to circumstances such as hazardous conditions, seasonal unavailability, malfunction of automatic sampling equipment and other legitimate reasons. If specimens are unobtainable due to sampling equipment malfunction, effort shall be made to complete corrective action prior to the end of the next sampling period. All deviations from the sampling schedule shall be documented in the Annual Radiological Environmental Operating Report. It is recognized that, at times, it may not be possible or practicable to continue to obtain samples of the media of choice at the most desired location or time. In these instances, suitable specific alternative media and locations may be chosen for the particular pathway in question and appropriate substitutions made within 30 days in the Radiological Environmental Monitoring Program, and submitted in the next Annual Radioactive Effluent Release Report, including a revised figure(s) and table for the ERMP reflecting the new location(s) with supporting information identifying the cause of the unavailability of samples for that pathway and justifying the section of the new location(s) for obtaining samples.

2. For the purposes of this table, a thermoluminescent dosimeter (TLD) is considered to be one phosphor. There are normally three calcium sulfate phosphors in an environmental TLD BADGE. Film badges shall not be used as dosimeters for measuring direct radiation.

3. Airborne particulate sample filters shall be analyzed for gross beta radioactivity 24 hours or more after sampling to allow for radon and thoron daughter decay. If gross beta activity in air particulate samples is greater than 10 times the yearly mean of control samples, gamma isotopic analysis shall be performed on the individual samples.

4. Gamma isotopic analysis means the identification and quantification of gamma-emitting radionuclides that may be attributable to the effluents from the facility.

5. If broadleaf vegetation food products are unavailable, additional air sampling as specified in Table 2.1, Parts 2 & 3 will be done in the SE (Station 8S2) and NNW (station 1S1) sectors.

6. The Branch Technical Position (Nov 79) states, "Any location from which milk can no longer be obtained may be dropped from the surveillance program after notifying the NRC in writing that they are no longer obtainable at that location". Although milk sampling performed at 5F2 is outside the 5-mile radius and is supplemental to the REMP, this notification should take place if 5F2 milk sampling ceases.

TABLE 2.2

Distances and Directions to Environmental Monitoring Stations

Station Code[a]	Station Name	Radial Direction** (True Heading) Degrees	Radial Distance** From Plant	
			km	Miles
0S1	Exclusion Fence-Northwest Corner	320	0.16	0.1
0S2	North Gate	320	0.8	0.5
1S1	Wastewater Pond	330	0.64	0.4
2S1	Back Road-300 m North of Plant	0	0.32	0.2
3S1	Road NW of 230 kV Switchyard	23	0.64	0.4
4S1	Back Road Between Switchyards	43	0.8	0.5
5S1	500 kV Switchyard	58	0.64	0.4
5S2	Diablo Creek Weir	65	0.96	0.6
5S3	Microwave Tower Road	70	1.02	0.7
6S1	Microwave Tower	94	0.8	0.5
7S1	Overlook Road	112	0.48	0.3
8S1	Target Range	125	0.8	0.5
8S2	Southwest Site Boundary	128	1.76	1.1
8S3	DCSF 96-1 monitoring well	145	0.52	0.33
9S1	South Cove	167	0.64	0.4
MT1	Meteorological Tower	185	0.32	0.2
DCM	Diablo Cove Marine	270	0.32	0.2
WN1	Northwest Guard Shack	290	0.32	0.2
WN2	Diablo Creek Outlet	283	0.25	0.15
1A1	Crowbar Canyon	327	2.56	1.6
1A2	Blanchard Spring	331	2.4	1.5
0B1	Point Buchon	325	5.76	3.6
1C1	Montana de Oro Campground	336	7.52	4.7
3C1	Ranch Vegetation	20	7.16	4.5
4C1	Clark Valley Gravel Pit	45	9.28	5.8
5C1	Junction Prefumo/See Canyon Roads	64	7.52	4.7
6C1	Household Garden	98	7.24	4.5
7C1	Pecho Creek Ruins (Mello Farm)	120	6.56	4.1
7C2	Rattlesnake Canyon	124	7.52	4.7
2D1	Sunnyside School	10	11.04	6.9
3D1	Clark Valley	24	9.92	6.2
4D1	Los Osos Valley Road	36	12.16	7.6
6D1	Junction See/Davis Canyon Roads	89	13.4	8.3
7D1	Avila Gate	118	10.56	6.6
7D2	Avila Beach	110	12.16	7.6
7D3	Avila Pier	120	11.0	6.9
2F1	Morro Bay (Commercial Landing)	0	17.44	10.9
5F1	SLO OEL	79	16.41	10.2
5F2	Cal Poly Farm	60	20.16	12.6
5F3	SLO County Health Department	70	20.32	12.7
7F1	Shell Beach	110	17.28	10.8

Table 2.2 (continued)

Station Code[a]	Station Name	Radial Direction** (True Heading) Degrees	Radial Distance** From Plant km	Miles
7G1	Arroyo Grande (Kawaoka Farm)	115	26.88	16.8
7G2	Oceano Substation	118	27.68	17.3
AVA	Avila Beach (near pier)	109	11.75	7.3
CBA	Cambria Moonstone Beach	330	45.86	28.5
CYA	Cayucos Beach (near pier)	350	26.87	16.7
DY1	Drywell 115'	77	0.041	0.026
DW1	Drinking Water (Plant Potable Water Sys)	161	0.59	0.37
IS1-IS8	ISFSI	65	0.48	0.3
MDO	Montana de Oro (Spooners Cove)	336	7.56	4.7
OW1	Observation Well 01	336	0.07	0.046
OW2	Observation Well 02	157	0.07	0.045
OEL	Offsite Emergency Lab	79	16.41	10.2
OUT	Plant Outfall	270	0.32	0.2
PMO	Pismo Beach (near pier)	113	20.76	12.9
PON	Pacific Ocean North of Diablo Cove	305	2.4	1.5
POS	Pacific Ocean South of Diablo Cove	180	0.64	0.4
WW2	Water Well 02	70	1.02	0.63
BCM	Blanchard Farm (Cow Meat)	320	1.94	1.2
BGM	Blanchard Farm (Goat Meat)	320	1.94	1.2
BSM	Blanchard Farm (Sheep Meat)	320	1.94	1.2
HCM	Hearst Ranch (Cow Meat)	328	59.5	37
JDM	Johe Property (Deer Meat)	21	5.24	3.26

*The reference point used is the dome of Unit 1 containment.

*Station Code (XYZ):

X - First number (0-9) represents the radial sector in which the station is located:

- 0 - Northwest
- 1 - North-northwest
- 2 - North
- 3 - North-northeast
- 4 - Northeast
- 5 - East-northeast
- 6 - East
- 7 - East-southeast
- 8 - Southeast
- 9 - South-southeast

Y - Letter (S, A-H) represents the distance from the plant:

- S - On-site
- A - 0-2 miles from plant (but off-site)
- B - 2-4 miles from plant
- C - 4-6 miles from plant
- D - 6-8 miles from plant
- E - 8-10 miles from plant
- F - 10-15 miles from plant
- G - 15-20 miles from plant
- H - Greater than 20 miles from plant

Z - Second number represents the station number within the zone.

Table 2.2 (continued)

*Station Codes exceptions:

The following stations do not follow the coding system:

- Diablo Cove Marine (DCM)
- Meteorological Tower (MT1)
- Northwest guard shack (WN1)
- Diablo Creek outlet (WN2)
- Pacific Ocean North (PON)
- Pacific Ocean South (POS)
- Offsite Emergency Lab (OEL)
- Plant outfall (OUT)
- Drinking water (DW1)
- Water Well 02 (WW2)
- Observation Well 01 (OW1)
- Observation Well 02 (OW2)
- Drywell 115 (DY1)
- Avila Beach (AVA)
- Montana de Oro - Spooners Cove (MDO)
- Pismo Beach (PMO)
- Cayucos Beach (CYA)
- Cambria Moonstone Beach (CBA)
- Blanchard Cow Meat (BCM)
- Blanchard Goat Meat (BGM)
- Blanchard Sheep Meat (BSM)
- Hearst Ranch Cow Meat (HCM)
- Johe Deer Meat (JDM)
- Johe Pig Meat (JPM)
- Andre Cow Meat (ACM)
- Andre Deer Meat (ADM)
- Andre Pig Meat (APM)
- ISFSI TLDs (IS1 – IS8)

TABLE 2.3:

Detection Capabilities for Environmental Sample Analysis [1] [2]

Lower Limits of Detection (LLD) [3]

Analysis	Water (pCi/L)	Airborne Particulate or Gases (pCi/m^3)	Fish (pCi/kg, wet)	Milk (pCi/L)	Food Products (pCi/kg, wet)	Sediment (pCi/kg, dry)
Gross beta	4	0.01				
H-3	400					
Mn-54	15		130			
Fe-59	30		260			
Co-58, 60	15		130			
Zn-65	30		260			
Zr-Nb-95	15					
Total Sr	1			1	500	2,000
I-131	1*	0.07		1	60	
Cs-134	15	0.05	130	15	60	150
Cs-137	18	0.06	150	18	80	180
Ba-La-140	15			15		

Table Notations

(1) This list does not mean that only these nuclides are to be considered. Other peaks that are identifiable, together with those of the above nuclides, shall also be analyzed and reported in the Annual Radiological Environmental Operating Report.

(2) Required detection capabilities for thermoluminescent dosimeters used for environmental measurements shall be in accordance with the recommendations of Regulatory Guide 4.13, Revision 1, July 1977.

(3) The LLD is defined, for purposes of these specifications, as the smallest concentration of radioactive material in a sample that will yield a net count, above system background, that will be detected with 95 percent probability with only 5 percent probability of falsely concluding that a blank observation represents a "real" signal.

* If no drinking water pathway exists, a value of 15 pCi/L may be used.

TABLE 2.3 (Continued)

Table Notations

For a particular measurement system, which may include radiochemical separation:

$$LLD = \frac{4.66 s_b}{E \times V \times 2.22 \times Y \times \exp(-\lambda t)}$$

Where:

LLD	=	the "a priori" the lower limit of detection as defined above (as pCi per unit mass or volume)
S_b	=	the standard deviation of the background counting rate or of the counting rate of a blank sample as appropriate (as counts per minute)
E	=	the counting efficiency (as counts per transformation)
V	=	the sample size (in units of mass or volume)
2.22	=	the number of transformations per minute per pico-curie
Y	=	the fractional radiochemical yield (when applicable)
λ	=	the radioactive decay constant for the particular radionuclide
t	=	the elapsed time between sample collection (or end of the sample collection period) and time of counting

The value of S_b used in the calculation of the LLD for a detection system will be based on the actual observed variance of the background counting rate or of the counting rate of the blank samples (as appropriate) rather than on an unverified theoretically predicted variance. In calculating the LLD for a radionuclide determined by gamma-ray spectrometry, the background will include the typical contributions of other radionuclides normally present in the samples (e.g., potassium-40 in milk samples). Analyses will be performed in such a manner that the stated LLDs will be achieved under routine conditions. Occasionally background fluctuations, unavoidably small sample sizes, the presence of interfering nuclides, or other uncontrollable circumstances may render these LLDs unachievable. In such cases, the contributing factors will be identified and described in the Annual Environmental Radiological Operating Report.

Typical values of E, V, Y and t should be used in the calculation. It should be recognized that the LLD is defined as a priori (before the fact) limit representing the capability of a measurement system and not as a posteriori (after the fact) limit for a particular measurement.

TABLE 2.4: Reporting Levels for Radioactivity Concentrations in Environmental Samples

Analysis	Water (pCi/L)	Airborne Particulate or Gases (pCi/m^3)	Fish (pCi/kg, wet)	Milk (pCi/L)	Food Products (pCi/kg, wet)
H-3	* 20,000				
Mn-54	1,000		30,000		
Fe-59	400		10,000		
Co-58	1,000		30,000		
Co-60	300		10,000		
Zn-65	300		20,000		
Sr-89	20				
Sr-90/Y-90	8				
Zr-Nb-95	400				
I-131	** 2	0.9		3	100
Cs-134	30	10	1,000	60	1,000
Cs-137	50	20	2,000	70	2,000
Ba-La-140	200			300	

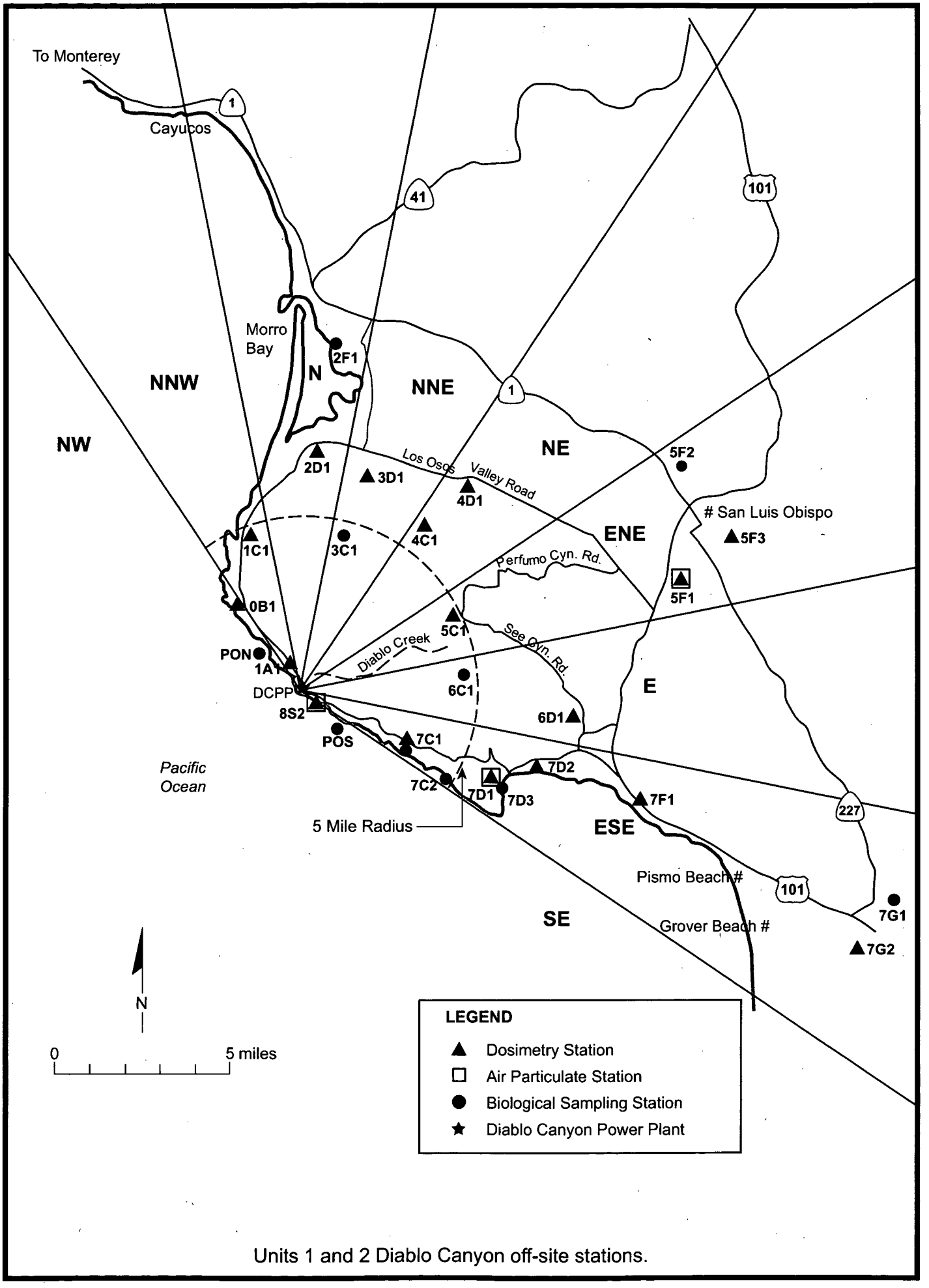
* For drinking water samples. This is the 40 CFR 141 value. If no drinking water pathway exists, a value of 30,000 pCi/L may be used.

** If no drinking water pathway exists, a value of 20 pCi/L may be used

Page Intentionally Blank

Figure 2.1- Diablo Canyon Off-site Stations

Page Intentionally Blank

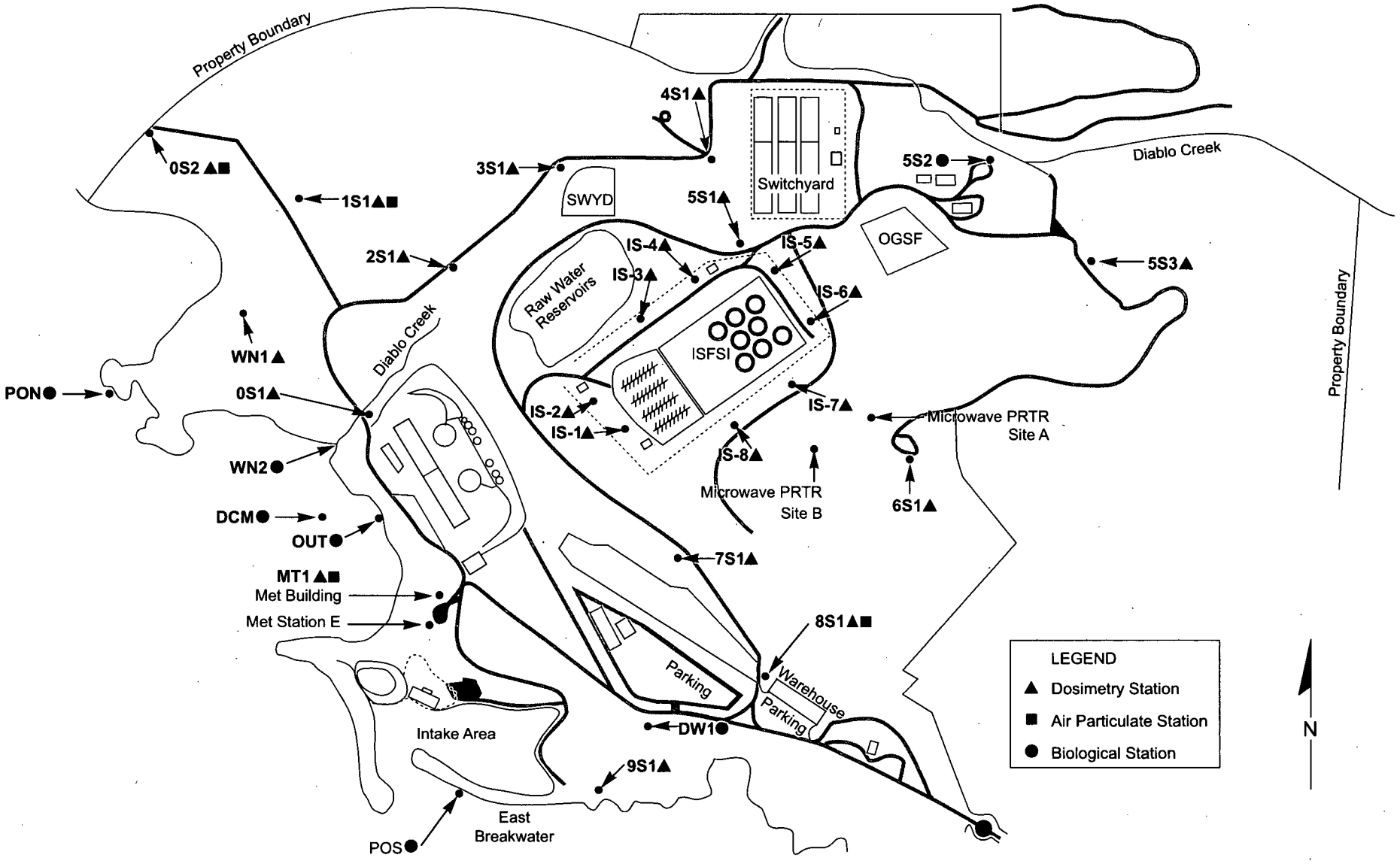


Units 1 and 2 Diablo Canyon off-site stations.

Page Intentionally Blank

Figure 2.2- Diablo Canyon On-site Stations

Page Intentionally Blank

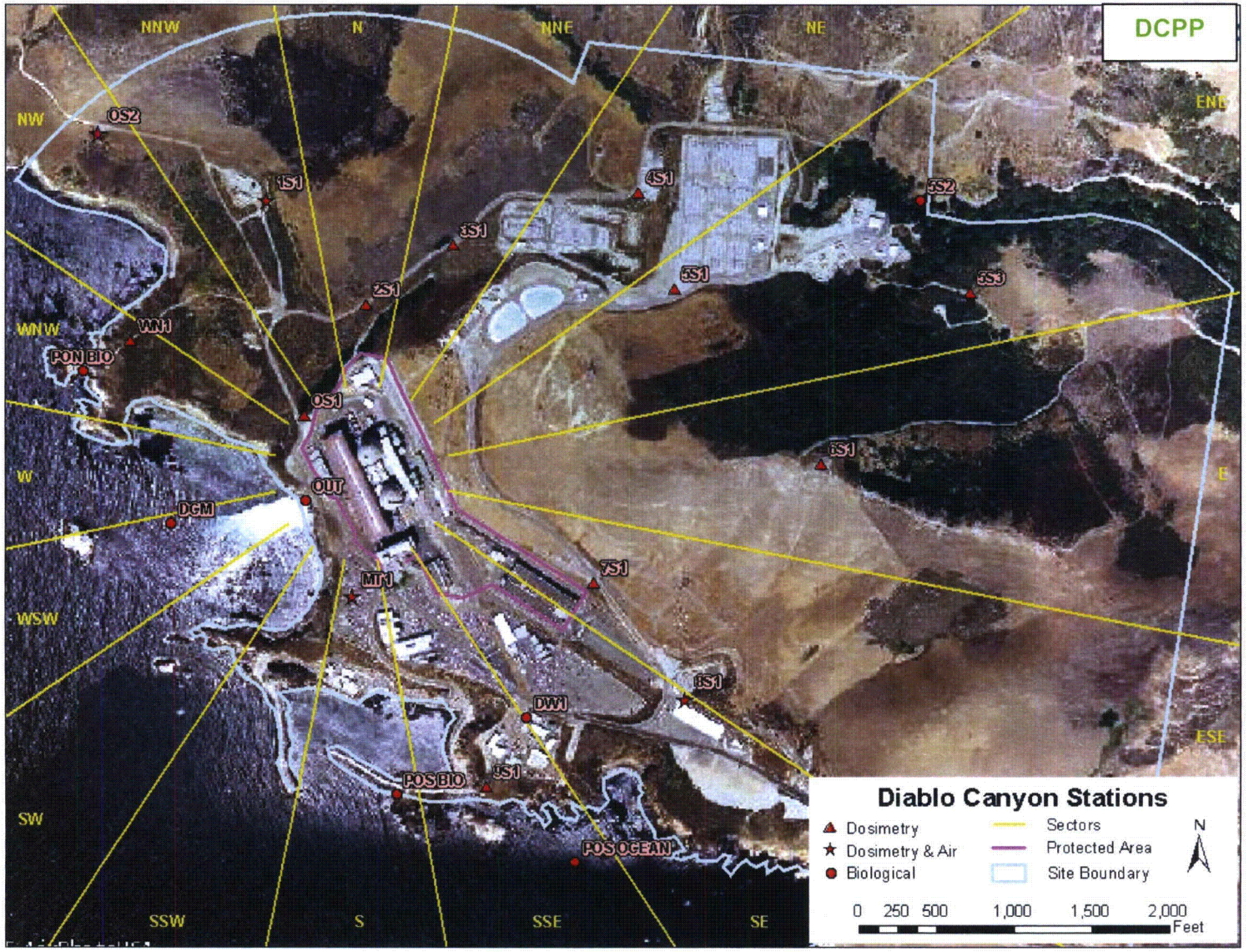


DCPP Onsite ERMP Stations

Page Intentionally Blank

Figure 2.3- Diablo Canyon Station Locations

Page Intentionally Blank


DCPP
NNW
N
NNE
NE
ENE
NW
OS2
1S1
4S1
3S2
3S1
5S1
5S3
2S1
WNW
WN1
PON BIO
OS1
6S1
W
E
OUT
DGM
7S1
MT1
WSW
8S1
DW1
ESE
POS BIO
0S1
SW
POS OCEAN
SSW
S
SSE
SE
Diablo Canyon Stations
Dosimetry
Dosimetry & Air
Biological
Sectors
Protected Area
Site Boundary
N
0 250 500 1,000 1,500 2,000
Feet

Page Intentionally Blank

3.0 RADIOLOGICAL DATA-SUMMARY OF TABLES

This section summarizes the analytical results of the environmental samples, which were collected during the monitoring period. The results, shown in Appendix A, are presented in a format similar to that prescribed in the NRC's Radiological Assessment Branch Technical Position on Environmental Monitoring. The results are ordered by sample media type and then by radionuclide.

Each table is nuclide specific, and the total number of analyses for that radionuclide during the monitoring period, are provided. Additionally, the number of measurements which exceeded the Reporting Levels (NRC Notification Level) found in Table 2.4 of this report are provided. The first column lists the matrix or pathway sampled during the period. The second column lists the nuclides analyzed and number of samples performed. The third column provides the required a-priori Lower Limit of Detection (LLD) for radionuclides that have detection capability requirements as specified in Table 2.3 of this report. The sixth and seventh columns contain the mean and average results for locations. The eighth column contains the number for reportable occurrences for the location pathway. Occasionally, the required LLD is not met. An example of this occurrence might be due to hold times between sampling and analysis. Such cases, if any, are addressed in Section 4.0 of this report.

The Minimum Detectable Concentration (MDC) listed for each analysis in Appendix C was used as an evaluation point for samples collected in the calendar year. The MDC was calculated by the laboratory with each analysis (a-posteriori) and incorporates conditions observed at the laboratory during the analysis. This MDC value mathematically represents the lowest concentration of activity that can be detected by the laboratory with a 95% confidence level. The MDC is also understood as the concentration where there is only a 5% probability of falsely reporting a positive detection in a true blank sample. Note that the MDC equation used by the environmental lab is equivalent to the Lower Limit of Detection (LLD) equation specified in NUREG 1301. For this report, a sample is considered to yield a "detectable measurement" when the "result" concentration exceeds the associated MDC value.

Additionally, the tables of Appendix A provide the mean of all sample results analyzed for the specified radionuclide/ media type, the range, and the number of samples that were considered to have detectable activity of all the samples counted.

- The mean value consists of the average of detectable concentrations.
- The lowest and highest detected concentration values were listed
- The number of detectable measurements and the total number of measurements were listed. For example, (4/20) would indicate that 4 of the 20 samples collected, for that sample type and that radionuclide, contained detectable radioactivity.

The radionuclides reported in this section represent those that:

- had an LLD requirement in Table 2.3 of this report, or a Reporting Level listed in Table 2.4
- were of specific interest for any other reason

The radionuclides routinely analyzed and reported for a gamma spectroscopy analysis are: Ac-228, Ag-110m, Be-7, K-40, Ce-144, Co-57, Co-58, Co-60, Cr-51, I-131, Cs-134, Cs-137, Ba-140, La-140, Fe-59, Mn-54, Nb-95, Ru-103, Rh-106, Sb-124, Sb-125, Zn-65, and Zr-95.

Data from direct radiation measurements made by TLD are also provided in Appendix A in a similar format described above. Actual quarterly TLD results are listed in Appendix B.

Additional supplemental REMP sampling was conducted in 2011 for the Fukushima Prefecture Japan, Dai-Ichi NPS nuclear accidents. This Fukushima event sampling data is also provided in Appendix A tables as described above.

4.0 ANALYSIS OF ENVIRONMENTAL RESULTS

4.1 REMP Sampling Variance / Deviations

The DCPP Radiological Environmental Monitoring Program allows for deviations in the REMP sampling schedule "if samples are unobtainable due to hazardous conditions, seasonal unavailability, or malfunction of sampling equipment." Such deviations do not compromise the program's effectiveness and are normally anticipated for any radiological environmental monitoring program.

The DCPP REMP includes both required and supplemental samples. This section describes the variances with the required samples and describes some of the supplemental sampling during the year.

4.1.1 DIRECT RADIATION

There were no abnormal affects to the 2011 station environmental TLD results.

Previous reporting errors were made in the 2009 and 2010 AREORs for stations 1A1 and 4S1. Corrections are as follows:
2009 1A1 reported total dose was 48.5 mrem ; corrected total dose is 47.4 mrem.
2009 1A1 reported average dose was 12.1 mrem ; corrected average dose is 11.9 mrem.
2009 1A1 reported standard deviation was 0.9 ; corrected standard deviation is 0.7.
2009 1A1 reported 2x standard deviation was 1.7 ; corrected 2x standard deviation is 1.5.
2009 4S1 reported total dose was 80.5 mrem ; corrected total dose is 76.7 mrem.
2009 4S1 reported average dose was 20.1 mrem ; corrected average dose is 19.2 mrem.
2009 4S1 reported standard deviation was 1.2 ; corrected standard deviation is 0.6.
2009 4S1 reported 2x standard deviation was 2.5 ; corrected 2x standard deviation is 1.3.
2010 1A1 reported total dose was 48.5 mrem ; corrected total dose is 45.1 mrem.
2010 1A1 reported average dose was 12.1 mrem ; corrected average dose is 11.3 mrem.
2010 1A1 reported standard deviation was 0.9 ; corrected standard deviation is 1.2.
2010 1A1 reported 2x standard deviation was 1.7 ; corrected 2x standard deviation is 2.4.
2010 4S1 reported total dose was 80.5 mrem ; corrected total dose is 74.4 mrem.
2010 4S1 reported average dose was 20.1 mrem ; corrected average dose is 18.6 mrem.
2010 4S1 reported standard deviation was 1.2 ; corrected standard deviation is 1.3.

4.1.2 AIRBORNE RADIOACTIVITY

The mean percent availability for all on-site and off-site air samplers was 99.9 percent. This means, on average, all air samplers were up and running 99.9 percent of the time. The remaining 0.1 percent can be attributed to equipment problems, filter exchange, and calibration processes.

Actual percent availability for each station were as follow:
0S2 = 99.9 %
1S1 = 99.9 %
5F1 = 100 %
7D1 = 100 %
8S1 = 99.7 %
8S2 = 99.9 %
MT1 = 100 %

Approximately 22 hours of air sampler lost run time occurred at station 8S1 from 1/19/11 to 1/26/11 due to an electrical power outage at this location.

Approximately 4 hours of air sampler lost run time occurred at stations 0S2, 1S1, 8S1, and 8S2 from 5/25/11 to 6/1/11 due to an electrical power outage at these locations.

4.1.3 MARINE SAMPLES

All marine samples were collected as scheduled (including allowable variation).

The California Department of Fish and Game has issued regulations prohibiting the collection of abalone along the central and southern coast of California. PG&E considers is unlikely that collection of abalone will be allowed in the DCPP environs in the near future. The REMP has therefore ceased routine abalone sampling. Note that the sampling of abalone was previously performed and was supplemental to the REMP.

4.1.4 TERRESTRIAL SAMPLES

All terrestrial samples were collected as scheduled (including allowable variation).

4.1.5 OCEAN SURFACE WATER, DRINKING WATER, AND GROUNDWATER

All water samples were collected as scheduled (including allowable variation).

4.1.6 REPLICATE SAMPLES

Replicate sampling is conducted within the REMP for program strength and correlation. Replicate samples were taken from 5F2 Vegetation (3/28/11), 5F2 Milk (3/21/11), DY1 Water (3/14/11), 7C2 Water (6/13/11), and OEL Drinking Water (9/29/11). The results of the analyses were within expected correlation.

4.2 COMPARISON OF ACHIEVED LLDS WITH REQUIREMENTS

For each analysis having an LLD requirement, criteria for the calculated "*a priori*" (before the fact) LLD were met during the sampling and analysis process. Meeting these process criteria satisfies the "a priori" LLD requirements. The "*a posteriori*" (after the fact) Minimum Detectable Concentration (MDC) for that analysis was also compared with the required "*a priori*" (before the fact) LLD.

Table 2.3 of this report gives the required "a priori" Lower Limits of Detection (LLDs) for environmental sample analyses required by the DCPP Radiological Environmental Monitoring Program. Occasionally an LLD is not achievable due to situations, such as hold times between sampling and analysis. In such a case, a discussion of the situation is provided.

The supplemental Fukushima event air sampling was conducted with different protocols than the normal REMP sampling and therefore the normal REMP LLDs may or may not apply. For example, the REMP increased Fukushima event sampling air flow (2.0 scfm) which resulted in increased sample volumes during those time periods. The Fukushima sampling event particulate filters were analyzed at the end of each week (instead of quarterly) which destroyed the filters for strontium analysis.

All other REMP samples analyzed met the specific "a-priori" LLD requirements in 2011.

4.3 COMPARISON OF RESULTS AGAINST REMP REPORTING LEVELS

Notification is required whenever a Reporting Level in Table 2.4 of this document is exceeded. Reporting Levels are the environmental concentrations that relate to the ALARA design dose objectives of 10 CFR 50, Appendix I. It should be noted that environmental concentrations are averaged over calendar quarters for the purposes of this comparison, and that Reporting Levels apply only to measured levels of radioactivity due to DCPP plant related effluents.

No REMP Reporting Levels were exceeded during this monitoring period.

It should be noted that Fukushima Japan event related isotopes are not DCPP plant related effluents and therefore do not apply to these reporting levels.

4.4 DATA ANALYSIS BY MEDIA TYPE

The REMP data for each media type is discussed below. A sample is considered to yield a "detectable measurement" when the result concentration exceeds the MDC for that analysis.

4.4.1 Direct Radiation (Environmental TLDs)

Direct radiation is continuously measured at 31 locations surrounding DCPP using Panasonic UD-814 thermoluminescent dosimeters (TLDs). These 31 locations are made up of 29 indicator stations & 2 control stations. These dosimeters are collected every calendar quarter for readout at the DCPP TLD Lab. The results are trended with preoperational and historical operating values for adverse trends.

DCPP Environmental TLD standard quarter results are measurements of all environmental gamma radiation sources (cosmic, terrestrial, radon, etc) at each station during the deployment period. Transient and lab storage background dose contributions were subtracted prior to reporting.

It should be noted that the following Environmental TLD locations are all within the DCPP site boundary and are not located within the unrestricted area : 0S1, 0S2, WN1, 1S1, 2S1, 3S1, 4S1, 5S1, 5S3, 6S1, 7S1, 8S1, 8S2, 9S1, MT1, and IS1 through IS8. The unrestricted area surrounding DCPP is sparsely inhabited out to five miles from the site (see 2011 Land Use Census). The ambient direct radiation levels within the DCPP plant site boundary (approximately 800 meter radius from U-1 CTMT structure) were elevated due to dry cask used fuel and radioactive material storage. An evaluation of direct radiation measurements and member of public occupancy times within the site boundary indicated all federal criteria for member of public dose limits were conservatively met.

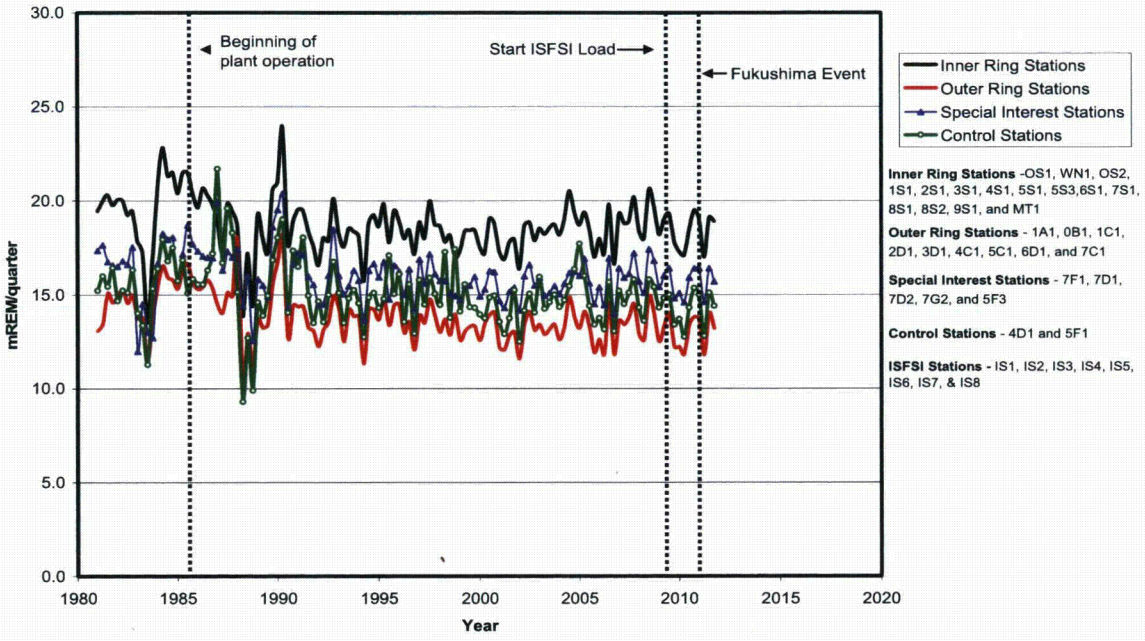
The first graph provided below illustrated overall trending of environmental TLDs with regard to distance from the DCPP plant site. Inner ring, outer ring, special interest, and control stations were combined and averaged to obtain a single standard quarter value for each plot line represented. It should be noted that inner and outer ring TLD averages remain within and trend with pre-operational ranges. It should also be noted that ISFSI loading and the Fukushima Japan nuclear accidents have not affected these inner and outer ring trending results.

The second graph provided below illustrated averaged environmental TLD results from the northwest (stations 0S1, 0S2, 0B1) and southeast (stations 8S1, 8S2) sectors. These sectors were chosen for graphical trending due to historical wind rose results for the site. The northwest and southeast sectors have been the highest historical averaged wind directions and therefore would have the most impact on environmental TLD results. Averaged control stations (4D1, 5F1) were provided for reference.

Appendix B provides individual station environmental TLD standard quarter dose results. Appendix B also provides an individual station historical average along with low/high ranges from 1987 to 2010 for comparison of the 2011 data.

No adverse trends were noted in 2011 Environmental TLD monitoring.

Trending Of TLD Direct Radiation Results



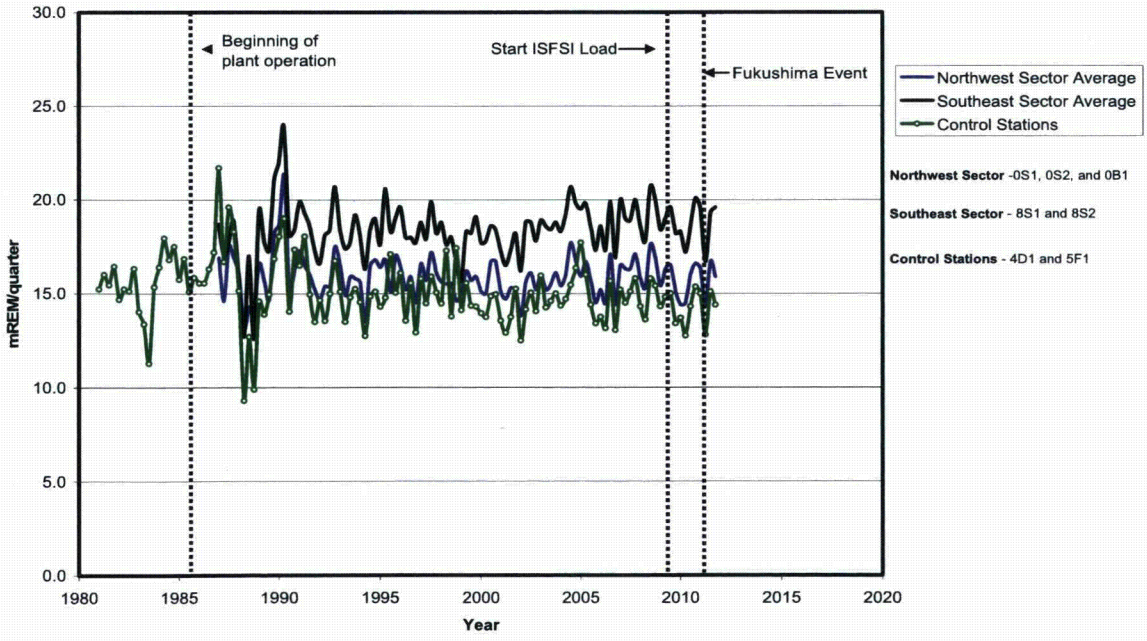
Inner Ring Stations -OS1, WN1, OS2, 1S1, 2S1, 3S1, 4S1, 5S1, 5S3,6S1, 7S1, 8S1, 8S2, 9S1, and MT1

Outer Ring Stations - 1A1, 0B1, 1C1, 2D1, 3D1, 4C1, 5C1, 6D1, and 7C1

Special Interest Stations - 7F1, 7D1, 7D2, 7G2, and 5F3

Control Stations - 4D1 and 5F1

ISFSI Stations - IS1, IS2, IS3, IS4, IS5, IS6, IS7, & IS8

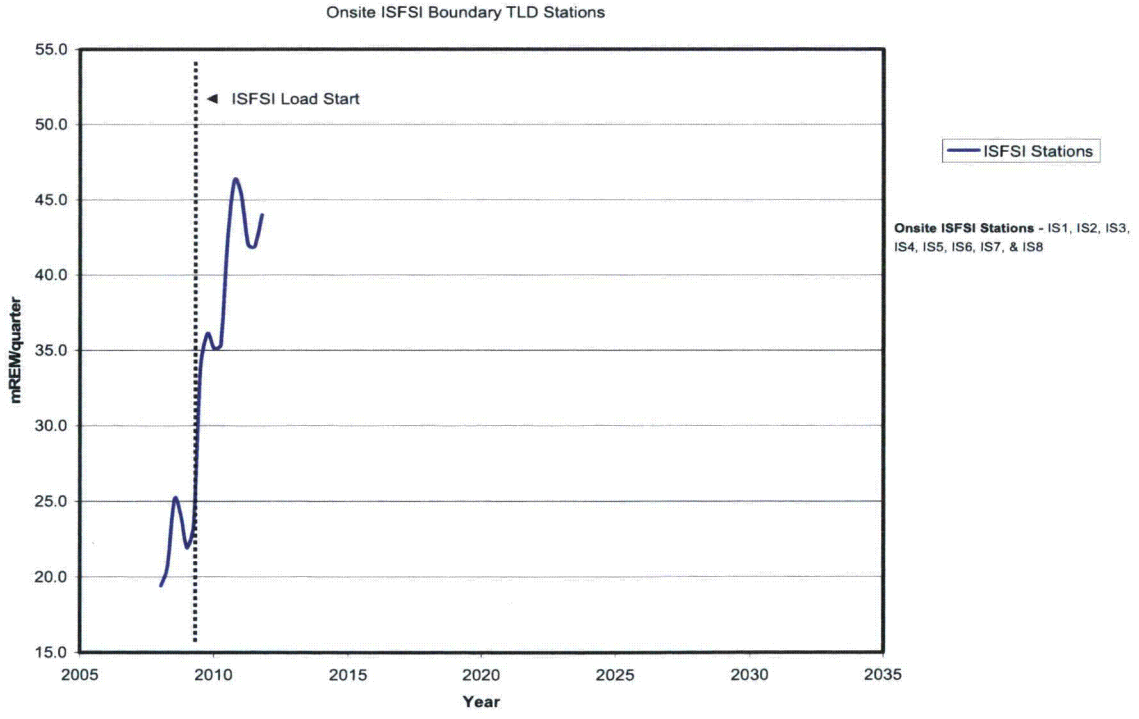


Northwest Sector -0S1, 0S2, and 0B1

Southeast Sector - 8S1 and 8S2

Control Stations - 4D1 and 5F1

Direct radiation is also continuously measured at 8 stations surrounding the Independent Spent Fuel Storage Installation (ISFSI) using Panasonic UD-814 thermoluminescent dosimeters (TLDs). These 8 stations are located directly adjacent to the ISFSI protected area, with 2 stations on each of the four sides of the ISFSI pad. It should be noted that these stations and the ISFSI are well within the DCPP site boundary and are not located within the unrestricted area. These dosimeters are collected every calendar quarter for readout at the DCPP TLD Lab. The first spent fuel canister was loaded onto the ISFSI pad in June 2009. The small increase in radiation levels at the ISFSI pad prior to spent fuel canister load was due to storage of Radioactive Material (RAM) equipment in seatrains at the ISFSI pad prior to an outage. These seatrains of RAM were removed prior to the first load of spent fuel canisters. In May 2010, DCPP began the second ISFSI loading of spent fuel canisters. The ambient direct radiation levels within the DCPP plant site boundary near the ISFSI were elevated due to dry cask used fuel storage. An evaluation of direct radiation measurements and member of public occupancy times surrounding the ISFSI indicated all federal criteria for member of public dose limits were conservatively met. No adverse trends were noted at the DCPP inner ring stations due to ISFSI for 2011 as indicated by the previous graphs. It should be noted that the DCPP inner ring TLD results tracked in correlation with normal Environmental TLD outer ring, special interest, and control station fluctuations. It should also be noted that DCPP inner ring TLD results remain within pre-operational ranges.



4.4.2 Airborne

Air particulate and radioiodine samples were collected weekly from six indicator stations (MT1, 0S2, 1S1, 7D1, 8S1, and 8S2) in the DCPP environs and one control station (5F1). A total of 364 air particulate filters and 364 iodine cartridges were collected and analyzed as part of the normal REMP. Additional air sampling was conducted from 3-16-11 through 5-4-11 due to the Fukushima Japan nuclear accidents. The data collected for the air sampling program is summarized in Appendix A, Appendix C, and Appendix D..

Gross beta activity was detected in almost every weekly air particulate sample collected from all indicator and control stations. Comparison of the data showed that the mean values of gross beta activities for the indicator stations were consistent with those obtained for the control station and historical trending. Normal background gross beta values range from 2E-3 to 9E-2 pCi/m3. The gross beta activities detected at the air sampling stations are tabulated in Appendix A.

Gamma isotopic analyses were performed on quarterly composites of the air particulate filters from each of the normal REMP stations. The Fukushima event supplemental air samples were analyzed individually at the end of each week. I-131, I-132, Te-132, Cs-134, and Cs-137 were detected in REMP and Fukushima event supplemental air sampling in March, April, and May. These isotopes originated from the Fukushima Japan nuclear accidents and were transported to the west coast of the United States via the jet stream. It should be noted that the 2-12-11 identification of isotopes is due to the quarterly analysis midpoint reference of the first quarter of 2011. Therefore, isotopes captured on normal REMP particulate filters in March (after the Fukushima event) were counted with the other REMP filters from the first quarter and the midpoint date assigned. Appendix A summarizes those results.

A total of 364 normal REMP weekly charcoal cartridges were analyzed for Iodine-131. Additional Fukushima event air sampling was also conducted from 3-16-11 through 5-4-11. Iodine-131 was detected in these charcoal cartridges during these date ranges due to the Fukushima Japan nuclear accidents. These isotopes were transported to the west coast of the United States via the jet stream. The supplemental Fukushima event air sampling was conducted at an increased flow rate (2.0 scfm) and increased volume.

No Iodine-131 was detected in any of the remaining station charcoal cartridges after 5-4-11.

Appendix A summarizes normal REMP and Fukushima event supplemental air sampling results.

4.4.3 Drinking Water, Ocean Surface Water, and Groundwater

Drinking Water

Drinking water samples were collected from stations DW1, 5S2, WN2, 1A2, and OEL (control location). The samples were analyzed for gamma emitters, gross beta, tritium, Total Strontium, Iron-55, and Nickle-63.

No plant related radionuclides were detected in any of the drinking water samples.
The results of the water samples collected from both the indicator and control stations are summarized in Appendix A.

Ocean Surface Water
Ocean surface water samples were collected monthly from stations OUT, DCM, and control station 7C2. The samples were analyzed for gamma emitters, gross beta, tritium, Total Strontium, Iron-55, and Nickle-63.

No plant related radionuclides were detected in any of the samples.
The results of the water samples collected from both the indicator and control stations are summarized in Appendix A.

Groundwater
As part of the nuclear industry NEI 07-07 Groundwater Protection Initiative (GPI), DCPP began sampling various water sources in 2006. These sources included onsite monitoring wells (OW1, OW2, DY1, & 8S3), an aquifer well (WW2), a creek (5S2 & WN2), and a groundwater spring (1A2).

Two groundwater aquifer wells are available within the plant site boundary; Water Well 01 and Water Well 02. These wells are located about 115' above and to the east of the power block. Water Well 01 was abandoned and the well pump was inoperable. Water Well 02 was sampled and only naturally occurring isotopes were detected.

One shallow (approximately 70 feet deep) subsurface monitoring well was located Southeast at approximately 0.3 miles from the power block. This monitoring well is labeled DCSF96-1 (8S3). No tritium or plant related isotopes were found in the 8S3 monitoring well during 2011.

Stations 5S2, WN2, and 1A2 were discussed in the previous Drinking Water paragraph.

Three shallow (approximately 37 to 73 feet deep) subsurface monitoring wells are located within the plant protected area and in close proximity to the containment structures, spent fuel pools, and auxiliary building (plant power block). These monitoring wells are labeled Observation Well 01 (OW1), Observation Well 02 (OW2), and Drywell 115 (DY1). Due to rainwater washout of gaseous tritium exiting the plant vent system (via an approved discharge path), these monitoring wells contained low levels of tritium throughout 2011. Further reporting of these monitoring wells was provided in Section 5.2 of this report.

Two additional groundwater monitoring wells were installed along the western side of the DCPP site on December 14, 2011. These wells were not ready for sampling in 2011. Future sampling will begin in the 2012 AREOR. For informational purposes, drill tailing sediment samples were obtained during the drilling process and analyzed for gamma spec. The drill tailing sediment samples are reported within this 2011 annual report within Appendix C. The new well station names are GW1 and GW2.

4.4.4 Ingestion

Marine Biological Samples

Fish samples were collected quarterly from stations DCM, 7C2 (control), PON, POS, and a local market (7D3 or 2F1). Mussels were collected quarterly from stations DCM, 7C2, and POS. Mussels were collected annually from station PON. A summary of these samples (required and supplemental) is described in Table 2.1. A summary of sample results is provided in Appendix A.

I-131 was detected in mussels at station 7C2 on 3-23-11 due to rain washout of Fukushima Japan event isotopes. The 7C2 sampling station is located at the discharge of a creek into the Pacific Ocean. The watershed for this creek caused large concentrations of I-131 to be available for mussel uptake. See Fukushima rain I-131 sampling results in Appendix A. These isotopes were transported from Japan to the west coast of the United States via the jet stream.

All other marine fish and mussel samples did not detect any DCPP related radionuclides during 2011.

Marine Aquatic Vegetation

Supplemental marine aquatic kelp sampling was performed quarterly at REMP sample stations DCM, PON, POS, and 7C2 (control). No DCPP related isotopes were detected in 2011.

Supplemental intertidal algae sampling was performed quarterly at REMP sample stations DCM and 7C2 (control). No DCPP related isotopes were detected in 2011.

Each sample was analyzed for gamma emitting radionuclides. A summary of the sample results is provided in Appendix A.

Ocean Sediment and Recreational Beach Sampling

Ocean sediment samples were collected annually from stations DCM and 7C2. Gamma Spec, Total Strontium, Iron-55, and Nickle-63 were analyzed.

Supplemental recreational beach sand samples were collected semi-annually from stations Avila Beach (AVA), Montana de Oro Spooner's Cove (MDO), Pismo Pier Beach (PMO), Cayucos Morro Strand State Beach (CYA), and Cambria Moonstone Beach (CBA). Each sample was analyzed for gamma emitting radionuclides, Total Strontium, Iron-55, and Nickle-63.

Only natural occurring isotopes where detected in the ocean sediment and recreational beach sand samples collected for 2011.

4.4.5 Food Crops (Vegetation)

Samples of broad leaf vegetation were collected monthly (when available) from two indicator stations (7C1 and 7G1), and one control location (5F2). Samples were collected quarterly from residence gardens at stations 3C1 and 6C1. The samples were analyzed for gamma emitting radionuclides and for Iodine-131 on edible portions.

I-131, Cs-134, and Cs-137 were detected in these vegetation samples due to the Fukushima Japan nuclear accidents. These isotopes were transported to the west coast of the United States via the jet stream.

As further control sampling, supplemental Fukushima event vegetation sampling was conducted in Atascadero, California (20 miles north of DCPP). These Fukushima related isotopes were also detected in various vegetation samples at this control station. A summary of the sample results are provided in Appendix A.

4.4.6 Milk

There are no milking animals within 5 miles of the plant site. In cases where milk sampling is not available, the REMP program permits the collection of broad leaf vegetation from three sample

locations in place of milk. Since broadleaf sampling is also not available in the DCPP environs, the DCPP REMP requires additional air sampling at stations 8S2 and 1S1.

Supplemental samples of milk were collected monthly from Cal Poly Farm (station 5F2). The samples were analyzed for gamma emitting radionuclides, Iodine-131, and Total Strontium. Milk samples were collected monthly from station 5F2 regardless of the availability of milk stations within 5 miles of the plant.

I-131, Cs-134, and Cs-137 were detected in these milk samples due to the Fukushima Japan nuclear accidents. These isotopes were transported to the west coast of the United States via the jet stream. Vegetation uptake and subsequent digestion by the cows were the source of these isotopes into the milk. A summary of the sample results are provided in Appendix A.

4.4.7 Meat Products

Meat products were collected quarterly (when available and provided) from landowners.

Samples of livestock meat were collected from the Blanchard Ranch in 2011. These samples were Blanchard cow meat (BCM), Blanchard sheep meat (BSM), and Blanchard goat meat (BGM).

One wild deer meat sample was supplied by a landowner in 2011.

Additional Fukushima Japan event meat sampling was conducted of Hearst Ranch meat which is located approximately 37 miles north of the DCPP site. This Hearst Ranch meat is free range, grass fed beef. This new REMP station code was HCM and provides a control location far from the site.

Cs-134 and Cs-137 were detected in these meat samples due to the Fukushima Japan nuclear accidents. These isotopes were transported to the west coast of the United States via the jet stream. Vegetation uptake and subsequent digestion by the animals were the source of these isotopes into the meat. A summary of the sample results are provided in Appendix A.

4.5 SUPPLEMENTAL ENVIRONMENTAL SAMPLING AND ISOTOPIC DETECTION DUE TO THE FUKUSHIMA PREFECTURE JAPAN, DAI-ICHI NUCLEAR POWER STATION ACCIDENTS.

On March 11th, 2011 the Tohoku earthquake (magnitude 9.0 M_W) and tsunami struck the east coast of Japan. The tsunami associated with this event caused nuclear accidents at the Dai-Ichi Nuclear Power Station in Fukushima Prefecture, Japan. Isotopic releases occurred in Japan and were carried by the jet stream to the west coast of the United States.

The DCPP REMP initiated numerous supplemental sampling to establish Fukushima contributions to DCPP isotopic background concentrations. Supplemental DCPP environmental sampling included the following:

- Capture of rain in March and April for isotopic analysis (see Appendix A & D)
- Additional air sampling at stations 0S2, 5F1, 7D1, and 8S1. This air sampling was conducted with additional air samplers at an increased flow rate (2.0 scfm) and increased volumes. The station samples were analyzed each week for gamma isotopic and strontium which is different than normal REMP sampling protocols (see Appendix D)

- Additional milk and vegetation sampling was conducted at station 5F2 (Appendix A & C).
- Additional vegetation sampling was conducted outside the possible influence of DCPP within Atascadero, California (20 miles north of DCPP). Fescue grass, milk thistle, miner's lettuce, and acorns were sampled in Atascadero (station ATAS) to establish additional control vegetation samples (see Appendix D).
- Additional meat control sampling was conducted outside the possible influence of DCPP at Hearst Ranch which is located 37 miles north of DCPP near San Simeon, California. Publically offered Hearst Ranch meat (station HCM) was free range, grass fed beef and provided a control for Blanchard meat (stations BCM, BSM, and BGM). The HCM sampling was provided in Appendix A & C.
- Sticky pads (1ft by 3ft) were placed at 0S2 and 5F1 to monitor ground deposition of Fukushima isotopes. These sticky pads were pulled weekly from 3-23-11 until 5-4-11 for isotopic analysis (see Appendix A & D).

Fukushima related isotopes were detected by the DCPP REMP beginning on March 17th, 2011.

The primary Fukushima related isotopes detected by the DCPP REMP were I-131, I-132, Te-132, Cs-134, and Cs-137.

Airborne isotopic concentrations were detected from March 17th thru April 20th.

The DCPP REMP continued to detect cesium within milk, vegetation, and meat throughout the end of 2011.

These supplemental REMP environmental air, rain, vegetation, milk, meat, and sticky pad samples were obtained during 2011. These samples identified detectable concentrations of isotopes that could be related to operation of Diablo Canyon NPS. Given the following facts, the detectable isotopic concentrations are not a result of Diablo Canyon NPS operation:

1. The quantities of radioactive airborne effluents from Diablo Canyon NPS during 2011 did not increase significantly compared to year 2010.
2. Prior REMP sample results have not detected the presence of these isotopes at these concentrations over the last ten years of DCPP operation.
3. The isotopes detected correspond to timelines related to the Fukushima Prefecture Japan nuclear accidents and the jet stream deposition of those isotopes to the west coast of the United States.
4. The concentrations detected within the indicator samples were also identified in the normal REMP control samples and supplemental Fukushima event sampling far from Diablo Canyon NPS.
5. These isotopes were also detected by other Government Agencies, Nuclear Power Sites, and Colleges across the United States.

As such, the atypical detection of these radionuclides in both indicator and control samples is credibly attributed to the trans-Pacific transport of airborne releases from Dai-Ichi, Fukushima following the March 11, 2011 Tohoku earthquake and was not related to the operations of Diablo Canyon NPS. A summary of the sample results are provided in Appendix A, Appendix C, and Appendix D.

5.0 GROUND WATER MONITORING

Diablo Canyon is committed to improving management of situations involving inadvertent radiological releases that get into onsite groundwater that is or may be used as a source of drinking water. This commitment reflects the nuclear industry's high standard of public radiation safety and protection of the environment. Trust and confidence on the part of local communities, States, the NRC, and the public is paramount to this commitment.

Studies of the DCPP ISFSI site and a general assessment of sub-regional hydro-geologic conditions indicates that groundwater (subsurface) flow beneath the Diablo Canyon power block site is west toward the Pacific Ocean or northwest toward Diablo Creek. It should be noted that Diablo Creek also discharges into the Pacific Ocean.

5.1 NEI 07-07 GROUNDWATER PROTECTION INITIATIVE VOLUNTARY REPORTING

5.1.1 NEI 07-07 Objective 2.4, Annual Reporting :

Document all on-site ground water sample results and a description of any significant on-site leaks/spills into ground water for each calendar year in the AREOR or the ARERR

DCPP Response to NEI 07-07 Objective 2.4

Onsite groundwater monitoring points are described in the REMP and reported in this Annual Radiological Environmental Operating Report (AREOR) as follows:

Observation Well 01 (OW1), Observation Well 02 (OW2), Drywell 115 (DY1), DCSF96-1 (8S3), Water Well 02 (WW2), and Diablo Creek Outlet (WN2) were used for data reporting. A summary of the sample results are provided in Appendix A and Appendix C.

DCPP REMP sampled all available groundwater regardless of present or future use. The ground water beneath the DCPP protected area is not used as a source of drinking water.

There were no significant onsite leaks/spills into groundwater in 2011.

Note: the term "significant" is defined by the NEI Initiative as an item or incident that is of interest to the public or stakeholders. It does not imply or refer to regulatory terminology nor is it intended to indicate that the leak or spill has public health and safety or environmental protection consequences. This term also has a volume component of greater than 100 gallons.

5.2 ADDITIONAL GROUNDWATER SAMPLING OVERVIEW:

Ground water monitoring was reported in accordance with the nuclear industry NEI 07-07 Groundwater Protection Initiative and the REMP. Concentrations of tritium were detected in three monitoring wells beneath the DCPP power block. This tritium was coming from the rain-washout of gaseous tritium exiting the plant vent system via an approved discharge route. DCPP has conducted rain-washout studies to document this phenomenon. These monitoring wells consisted of French drain systems that discharge into the associated monitoring well (OW1,

OW2, or DY1). Rain communicated with these French drain systems via building structure to ground interfaces. Once rain water entered the monitoring wells, the water remained stagnant until another rain event caused transport. Subsequent quarterly sampling routinely indicated correlated tritium values due to monitoring well stagnation. DY1 routinely experienced the highest tritium rain washout concentrations due to its close proximity to the plant vent discharge points. It should be noted that hydro geological studies of the DCPP site indicate that any groundwater (subsurface) flow beneath DCPP would flow toward the Pacific Ocean.

The specific ranges of tritium detected in these monitoring wells for 2011 are as follows:
OW1 - Observation Well 01 (401 to 710 pCi/L) of 4 samples collected for tritium analysis.
OW2 - Observation Well 02 (1,140 to 1,340 pCi/L) of 4 samples collected for tritium analysis.
DY1 - Drywell 115 (11,800 to 64,800 pCi/L) of 7 samples collected for tritium analysis.
No other DCPP related isotopes were detected.

Monitoring Well 8S3 was sampled 4 times in 2011. Tritium was not detected in these 4 samples from 8S3. No other DCPP related isotopes were detected.

All other samples of groundwater at 1A2, WW2, and WN2 did not indicate the presence of tritium or any other DCPP related isotopes (only naturally occurring radionuclides were observed).

6.0 OLD STEAM GENERATOR STORAGE FACILITY MONITORING

In accordance with the DCPP Offsite Dose Calculation Manual (ODCM), the Old Steam Generator Storage Facility (OSGSF) sumps were inspected quarterly. If water was found in the sump of a vault containing plant equipment, the expectation was to sample that sump water and dispose of the water per plant protocols via an approved discharge pathway.

For reference, the following equipment was placed into this OSGSF on the following dates:

- 3/2/08 (outage 2R14), four DCPP Unit Two (U-2) Steam Generators
- 2/14/09 (outage 1R15), four DCPP Unit One (U-1) Steam Generators
- 11/6/09 (outage 2R15), one DCPP Unit Two (U-2) Reactor (Rx) Head
- 10/23/10 (outage 1R16), one DCPP Unit One (U-1) Rx Head

As of 12/31/11, the OSGSF contains eight old Steam Generators and two old Rx Heads.

The OSGSF sumps were inspected quarterly by REMP personnel. During the first quarter of 2011, rainwater in-leakage was found within the U-1 old Rx Head vault # 28 and U-2 Old Steam Generator vault # 30 sumps.

This sump water had tritium concentrations of 2,000 to 34,000 pCi/Liter due to diffusion of tritium from the stored equipment, into the OSGSF air, and subsequent diffusion from the air into the stagnant sump water. This tritium concentration phenomenon was communicated to the rest of the industry.

The rainwater from the sumps was removed and processed via an approved DCPP radwaste discharge pathway.

Construction repairs were made to the OSGSF to prevent rainwater from entering the OSGSF. Specific repairs involved OSGSF vertical wall crack repairs and installation of roof gutters around the east and south side of the OSGSF. These repairs have been successful for prevention of rainwater intrusion into the OSGSF. These OSGSF sumps remained dry in 2011.

7.0 CROSS CHECK PROGRAM

Page Intentionally Blank

GEL | Laboratories LLC

2011 ANNUAL QUALITY ASSURANCE REPORT

FOR THE

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM (REMP)

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

2011 ANNUAL QUALITY ASSURANCE REPORT

FOR THE

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM (REMP)

Prepared By: _____ March 2, 2012
Martha J. Harrison Date
Quality Assurance Officer

Approved By: _____ March 2, 2012
Robert L. Pullano Date
Director, Quality Systems

TABLE OF CONTENTS

TABLE OF CONTENTS (CONTINUED)

TABLES

FIGURES

2011 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 2011. 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 2011.
- Inter-laboratory QC results analyzed during 2011 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 Florida/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, revision 1. 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 is conducted in accordance with the pre-established schedule from Standard Operating Procedure for the Conduct of Quality Audits, GL-QS-E001. 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
- 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 (11-RAD-001) was conducted in March 2011. Two (2) findings, three (3) observations, and four (4) recommendations resulted from this assessment. In April 2011, each finding was closed and appropriate laboratory staff addressed each observation and recommendation.

The Nuclear Procurement Issues Committee (NUPIC) audit was conducted on November 14, 2011 through November 18, 2011. This Duke Energy/NUPIC QA audit was performed for the activities and/or documentation/records associated with GEL Laboratories supplying general chemistry, radiochemistry and bioassay analytical services. This audit found that the GEL Laboratories quality system is well documented and/or implemented, and is acceptable.

With the exception of the six (6) audit findings, all of the requirements of GEL Laboratories Quality Assurance Plan audited were found to be satisfactorily implemented, and therefore, "Continued approval of GEL Laboratories as an Appendix B supplier of general chemistry, radiochemistry and bioassay analytical services is recommended."

All responses to the six findings have been adequately addressed by GEL. The Audit Report # 22837-A for Supplier Number 5644 has been posted on the NUPIC website.

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 2011, forty-three radioisotopes associated with seven 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 2011. 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 89 individual environmental analyses. The accuracy of each result reported to Eckert & Ziegler Analytics, Inc. is measured by the ratio of GEL's result to the known value. Of the 89 analyses, 98% (87 out of 89) of all results fell within GEL's acceptance criteria. Two analytical failures occurred with the analysis of Chromium-51 in water and Strontium-90 in milk.

For the corrective actions associated with these failures, refer to CARR110912-626 and CARR111129-644 (Table 6).

9. Summary of Participation in the MAPEP Monitoring Program

MAPEP Series 23, 24 and 25 were analyzed by the laboratory. Of the 167 analyses, 94% (157 out of 167) of all results fell within the PT provider's acceptance criteria. Ten analytical failures occurred: Plutonium-238 in soil, Plutonium-239/240 in soil, Plutonium-238 in water, Gross Alpha in filter, Iron-55 in soil, Iron-55 in water, Gross Alpha in filter, Gross Beta in filter, Plutonium-239/240 in filter, and Uranium-238 in filter.

For the corrective actions associated with MAPEP Series 23, 24 and 25, refer to CARR101122-526, CARR110107-533, CARR110705-12, CARR110809-618, CARR111219-653, and CARR120118-659 (Table 6).

10. Summary of Participation in the ERA MRaD PT Program

The ERA MRad program provided samples (MRAD-14 and MRAD-15) for 176 individual environmental analyses. Of the 176 analyses, 97% (170 out of 176) of all results fell within the PT provider's acceptance criteria. Six analytical failures occurred: Cesium-134 in soil, Americium-241 in soil, Gross Alpha in filter, Gross Beta in filter, Iron-55 in water, and Lead-214 in soil.

For the corrective actions associated with MRAD 14 and MRAD-15, refer to corrective actions CARR110603-600 and CARR111129-645 (Table 6).

11. Summary of Participation in the ERA PT Program

The ERA program provided samples (RAD-84, RAD-86, RAD-87 and RAD-800) for 69 individual environmental analyses. Of the 69 analyses, 96% (66 out of 69) of all results fell within the PT provider's acceptance criteria. Three analytical failures occurred: Barium-133 in water, Zinc-65 in soil, and I-131 in water.

For the corrective actions associated with RAD-84 and RAD-86, refer to corrective actions CARR110307-548, CARR110812-621, and CARR110912-628 (Table 6).

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.

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 6 provides the status of CARRs for radiological performance testing during 2011.

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. MARLAP, Multi-Agency Radiological Laboratory Analytical Protocols
12. 10 CFR Part 21, Reporting of Defects and Noncompliance
13. 10 CFR Part 50 Appendix B, Quality Assurance Criteria for Nuclear Power Plants and Fuel Reprocessing Plants
14. 10 CFR Part 61, Licensing Requirements for Land Disposal and Radioactive Waste
15. NRC REG Guide 4.15 and NRC REG Guide 4.8

TABLE 1

2011 RADIOLOGICAL PROFICIENCY TESTING RESULTS AND ACCEPTANCE CRITERIA

Quarter / Year	Analysis Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
1st / 2011	02/18/11	RAD - 84	Water	pCi/L	Barium-133	58.4	52.3	43.1 - 57.9	Not Acceptable
1st / 2011	02/18/11	RAD - 84	Water	pCi/L	Cesium-134	53.0	56.2	45.4 - 61.8	Acceptable
1st / 2011	02/18/11	RAD - 84	Water	pCi/L	Cesium-137	103	100	90.0 - 112	Acceptable
1st / 2011	02/18/11	RAD - 84	Water	pCi/L	Cobalt-60	73.2	68.9	62.0 - 78.2	Acceptable
1st / 2011	02/18/11	RAD - 84	Water	pCi/L	Zinc-65	166	153	138 - 180	Acceptable
1st / 2011	02/18/11	RAD - 84	Water	pCi/L	Gross Alpha	65.1	62.5	32.7 - 77.5	Acceptable
1st / 2011	02/18/11	RAD - 84	Water	pCi/L	Gross Beta	54.4	51.9	35.3 - 58.9	Acceptable
1st / 2011	02/18/11	RAD - 84	Water	pCi/L	Gross Alpha	51.2	62.5	32.7 - 77.5	Acceptable
1st / 2011	02/18/11	RAD - 84	Water	pCi/L	Radium-226	8.06	8.26	6.21 - 9.71	Acceptable
1st / 2011	02/18/11	RAD - 84	Water	pCi/L	Radium-228	7.4	7.35	4.64 - 9.40	Acceptable
1st / 2011	02/18/11	RAD - 84	Water	pCi/L	Uranium (Nat)	46.1	45.6	37.0 - 50.7	Acceptable
1st / 2011	02/18/11	RAD - 84	Water	ug/L	Uranium (Nat) mass	69.6	66.5	53.9 - 74.0	Acceptable
1st / 2011	02/18/11	RAD - 84	Water	pCi/L	Radium-226	9.68	8.26	6.21 - 9.71	Acceptable
1st / 2011	02/18/11	RAD - 84	Water	pCi/L	Radium-228	6.41	7.35	4.64 - 9.40	Acceptable
1st / 2011	02/18/11	RAD - 84	Water	pCi/L	Uranium (Nat)	45.3	45.6	37.0 - 50.7	Acceptable
1st / 2011	02/18/11	RAD - 84	Water	ug/L	Uranium (Nat) mass	67.6	66.5	53.9 - 74.0	Acceptable
1st / 2011	02/18/11	RAD - 84	Water	pCi/L	Tritium	2930	3460	2930 - 3820	Acceptable
1st / 2011	02/18/11	RAD - 84	Water	pCi/L	Strontium-89	48.9	55.3	44.1 - 62.9	Acceptable
1st / 2011	02/18/11	RAD - 84	Water	pCi/L	Strontium-90	27	33.1	24.2 - 38.3	Acceptable
1st / 2011	02/18/11	RAD - 84	Water	pCi/L	Strontium-89	55.3	55.3	44.1 - 62.9	Acceptable
1st / 2011	02/18/11	RAD - 84	Water	pCi/L	Strontium-90	29.3	33.1	24.2 - 38.3	Acceptable
1st / 2011	02/18/11	RAD - 84	Water	pCi/L	Iodine-131	29	26.8	22.3 - 31.5	Acceptable
1st / 2011	02/18/11	RAD - 84	Water	pCi/L	Iodine-131	23.9	26.8	22.3 - 31.5	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaS23	Soil	Bq/kg	Americium-241	63.27	87	61- 113	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaS23	Soil	Bq/kg	Cesium-134	924	940	658 - 1222	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaS23	Soil	Bq/kg	Cesium-137	685	670	469 - 871	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaS23	Soil	Bq/kg	Cobalt-60	360	343	240 - 246	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaS23	Soil	Bq/kg	Iron-55	1120	1333	933 - 1733	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaS23	Soil	Bq/kg	Manganese-54	875.3	820	574 - 1066	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaS23	Soil	Bq/kg	Nickel-63	901.3	1058	741 - 1375	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaS23	Soil	Bq/kg	Plutonium-238	12.4	64	45 - 83	Not Acceptable
1st / 2011	11/10/10	MAPEP-10-MaS23	Soil	Bq/kg	Plutonium-239/240	21.87	71	50 - 92	Not Acceptable
1st / 2011	11/10/10	MAPEP-10-MaS23	Soil	Bq/kg	Potassium-40	774	699	489-909	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaS23	Soil	Bq/kg	Technetium-99	272.3	325	228 - 423	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaS23	Soil	Bq/kg	Uranium-234/233	266.33	278	195 - 361	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaS23	Soil	Bq/kg	Uranium-238	171	143	83.6 - 210	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaS23	Soil	Bq/kg	Zinc-65	301	265	186 - 345	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaW23	Water	Bq/L	Cesium-134	31.4	31.4	22.0 - 40.8	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaW23	Water	Bq/L	Cesium-137	45.5	44.2	30.9 - 57.5	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaW23	Water	Bq/L	Cobalt-57	36.53	36.0	25.2 - 46.8	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaW23	Water	Bq/L	Cobalt-60	29.10	28.3	19.8 - 36.38	Acceptable

Quarter / Year	Analysis Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
1st / 2011	11/10/10	MAPEP-10-MaW23	Water	Bq/L	Hydrogen-3	429.30	453.4	317.4 - 589.4	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaW23	Water	Bq/L	Iron-55	61.43	60.2	42.1 - 78.3	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaW23	Water	Bq/L	Nickel-63	50	56.10	39.3 - 72.9	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaW23	Water	Bq/L	Plutonium-238	0.866	1.81	1.27 - 2.35	Not Acceptable
1st / 2011	11/10/10	MAPEP-10-MaW23	Water	Bq/L	Plutonium-239/240	1.22	1.35	0.95 - 1.76	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaW23	Water	Bq/L	Potassium-40	42.3	38.9	27.2 - 50.6	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaW23	Water	Bq/L	Strontium-90	7.03	8.3	5.8 - 10.8	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaW23	Water	Bq/L	Technetium-99	33.3	33.6	23.5 - 43.7	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaW23	Water	Bq/L	Uranium-234/233	1.937	2.01	1.41 - 2.61	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaW23	Water	Bq/L	Uranium-238	2.043	2.07	1.45 - 2.69	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaW23	Water	Bq/L	Zinc-65	34.77	31.0	21.7 - 40.3	Acceptable
1st / 2011	11/10/10	MAPEP-10-GrW23	Water	Bq/L	Gross Alpha	1.67	1.92	0.58 - 3.26	Acceptable
1st / 2011	11/10/10	MAPEP-10-GrW23	Water	Bq/L	Gross Beta	4.407	4.39	2.20 - 6.59	Acceptable
1st / 2011	11/10/10	MAPEP-10-RaF23	Filter	ug/sample	Uranium-235	0.0764	0.074	0.052 - 0.096	Acceptable
1st / 2011	11/10/10	MAPEP-10-RaF23	Filter	ug/sample	Uranium-238	10.5	10.2	7.1 - 13.3	Acceptable
1st / 2011	11/10/10	MAPEP-10-RaF23	Filter	ug/sample	Uranium-Total	10.9	10.3	7.2 - 13.4	Acceptable
1st / 2011	11/10/10	MAPEP-10-RaF23	Filter	Bq/sample	Americium-241	0.0917	0.115	0.081 - 0.150	Acceptable
1st / 2011	11/10/10	MAPEP-10-RaF23	Filter	Bq/sample	Cesium-134	2.95	2.98	2.09 - 3.87	Acceptable
1st / 2011	11/10/10	MAPEP-10-RaF23	Filter	Bq/sample	Cobalt-57	4.06	4.08	2.86 - 5.30	Acceptable
1st / 2011	11/10/10	MAPEP-10-RaF23	Filter	Bq/sample	Cobalt-60	2.97	2.92	2.04 - 3.80	Acceptable
1st / 2011	11/10/10	MAPEP-10-RaF23	Filter	Bq/sample	Manganese-54	3.347	3.18	2.23 - 4.13	Acceptable
1st / 2011	11/10/10	MAPEP-10-RaF23	Filter	Bq/sample	Plutonium-238	0.049	0.0489	0.0342-0.0336	Acceptable
1st / 2011	11/10/10	MAPEP-10-RaF23	Filter	Bq/sample	Plutonium-239/240	0.076	0.082	0.057 - 0.107	Acceptable
1st / 2011	11/10/10	MAPEP-10-RaF23	Filter	Bq/sample	Strontium-90	0.854	1.01	0.71 - 1.31	Acceptable
1st / 2011	11/10/10	MAPEP-10-RaF23	Filter	Bq/sample	Uranium-234/233	0.124	0.122	0.085 - 0.159	Acceptable
1st / 2011	11/10/10	MAPEP-10-RaF23	Filter	Bq/sample	Uranium-238	0.122	0.127	0.089 - 0.165	Acceptable
1st / 2011	11/10/10	MAPEP-10-GrF23	Filter	Bq/sample	Gross Beta	0.525	0.5	0.25 - 0.75	Acceptable
1st / 2011	11/10/10	MAPEP-10-GrF23	Filter	Bq/sample	Gross Beta	106	109	82.2 - 140	Acceptable
1st / 2011	11/10/10	MAPEP-10-RdV23	Vegetation	Bq/sample	Americium-241	0.210	0.270	0.189 - 0.351	Acceptable
1st / 2011	11/10/10	MAPEP-10-RdV23	Vegetation	Bq/sample	Cesium-134	4.485	4.79	3.35 - 6.23	Acceptable
1st / 2011	11/10/10	MAPEP-10-RdV23	Vegetation	Bq/sample	Cesium-137	4.759	5.88	4.12 - 7.64	Acceptable
1st / 2011	11/10/10	MAPEP-10-RdV23	Vegetation	Bq/sample	Cobalt-57	9.389	8.27	5.79 - 10.75	Acceptable
1st / 2011	11/10/10	MAPEP-10-RdV23	Vegetation	Bq/sample	Manganese-54	7.34	6.287	4.401 - 8.173	Acceptable
1st / 2011	11/10/10	MAPEP-10-RdV23	Vegetation	Bq/sample	Plutonium-238	0.258	0.221	0.155 - 0.287	Acceptable
1st / 2011	11/10/10	MAPEP-10-RdV23	Vegetation	Bq/sample	Strontium-90	2.790	2.63	1.84 - 3.42	Acceptable
1st / 2011	11/10/10	MAPEP-10-RdV23	Vegetation	Bq/sample	Uranium-234/233	0.392	0.320	0.224 - 0.416	Acceptable
1st / 2011	11/10/10	MAPEP-10-RdV23	Vegetation	Bq/sample	Uranium-238	0.405	0.330	0.231 - 0.429	Acceptable
1st / 2011	11/10/10	MAPEP-10-RdV23	Vegetation	Bq/sample	Zinc-65	6.630	5.39	3.77 - 7.01	Acceptable
2nd / 2011	05/03/11	040511P	Water	pCi/L	Strontium-89	57.9	68.1	55.4 - 76.2	Acceptable
2nd / 2011	05/03/11	040511P	Water	pCi/L	Strontium-90	32.4	29.9	21.8 - 34.7	Acceptable
2nd / 2011	04/05/11	GENE01-11-MaWR3	Water	Bq/L	Plutonium-238	1.1	1.16	0.81 - 1.51	Acceptable
2nd / 2011	04/05/11	GENE01-11-MaWR3	Water	Bq/L	Plutonium-239/240	0.8	0.85	0.60 - 1.11	Acceptable
2nd / 2011	04/05/11	GENE01-11-RdFR1	Water	Bq/sample	Plutonium-238	0.00737	0.00836	.00585-.01087	Acceptable
2nd / 2011	04/05/11	GENE01-11-RdFR1	Water	Bq/sample	Plutonium-239/240	0.00481	0.00670	.00469-.00871	Acceptable
1st / 2011	01/11/11	E7468-278	Water	pCi/L	Iodine-131	9.73E+01	9.40E+01	1.04	Acceptable
1st / 2011	01/11/11	E7468-278	Water	pCi/L	Chromium-51	2.16E+02	1.96E+02	1.10	Acceptable

Quarter / Year	Analysis Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
1st / 2011	01/11/11	E7468-278	Water	pCi/L	Cesium-137	1.47E+02	1.35E+02	1.09	Acceptable
1st / 2011	01/11/11	E7468-278	Water	pCi/L	Cobalt-58	7.71E+01	7.44E+01	1.04	Acceptable
1st / 2011	01/11/11	E7468-278	Water	pCi/L	Manganese-54	1.88E+02	1.75E+02	1.08	Acceptable
1st / 2011	01/11/11	E7468-278	Water	pCi/L	Iron-59	1.26E+02	1.15E+02	1.10	Acceptable
1st / 2011	01/11/11	E7468-278	Water	pCi/L	Zinc-65	1.90E+02	1.72E+02	1.11	Acceptable
1st / 2011	01/11/11	E7468-278	Water	pCi/L	Cobalt-60	1.14E+02	1.13E+02	1.01	Acceptable
1st / 2011	01/11/11	E7466-278	Milk	pCi/L	Strontium-89	9.23E+01	9.74E+01	0.95	Acceptable
1st / 2011	01/11/11	E7466-278	Milk	pCi/L	Strontium-90	1.27E+01	1.58E+01	0.80	Acceptable
1st / 2011	01/11/11	E7467-278	Milk	pCi/L	Iodine-131	1.00E+02	9.69E+01	1.03	Acceptable
1st / 2011	01/11/11	E7467-278	Milk	pCi/L	Chromium-51	3.27E+02	2.98E+02	1.10	Acceptable
1st / 2011	01/11/11	E7467-278	Milk	pCi/L	Cesium-134	1.19E+02	1.30E+02	0.91	Acceptable
1st / 2011	01/11/11	E7467-278	Milk	pCi/L	Cesium-137	2.20E+02	2.05E+02	1.07	Acceptable
1st / 2011	01/11/11	E7467-278	Milk	pCi/L	Cobalt-58	1.18E+02	1.13E+02	1.04	Acceptable
1st / 2011	01/11/11	E7467-278	Milk	pCi/L	Manganese-54	2.78E+02	2.66E+02	1.04	Acceptable
1st / 2011	01/11/11	E7467-278	Milk	pCi/L	Iron-59	1.94E+02	1.75E+02	1.11	Acceptable
1st / 2011	01/11/11	E7467-278	Milk	pCi/L	Zinc-65	2.88E+02	2.61E+02	1.10	Acceptable
1st / 2011	01/11/11	E7467-278	Milk	pCi/L	Cobalt-60	1.76E+02	1.72E+02	1.03	Acceptable
1st / 2011	01/11/11	E7465-278	Cartridge	pCi	Iodine-131	1.03E+02	9.47E+01	1.09	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	pCi/kg	Actinium-228	1290	1490	958 - 2100	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	pCi/kg	Bismuth-212	1340	1400	368 - 2090	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	pCi/kg	Bismuth-214	749	725	445 - 1040	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	pCi/kg	Cesium-134	3240	2450	1580 - 2950	Not Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	pCi/kg	Cesium-137	2440	1920	1470 - 2490	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	pCi/kg	Cobalt-60	2850	2220	1620 - 2980	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	pCi/kg	Lead-212	1160	1440	931 - 2030	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	pCi/kg	Lead-214	848	805	482 - 1200	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	pCi/kg	Manganese-54	<33.9	0.00	---	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	pCi/kg	Potassium-40	11400	11500	8320 - 15600	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	pCi/kg	Thorium-234	696	962	305 - 1830	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	pCi/kg	Zinc-65	2670	1990	1580 - 2670	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	pCi/kg	Strontium-90	6570	7590	2740 - 12400	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	pCi/kg	Uranium-234	941	972	616 - 1210	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	pCi/kg	Uranium-238	776	962	588 - 1220	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	pCi/kg	Uranium-Total	1754	1980	1130 - 2670	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	ug/kg	Uranium-Total(mass)	2314	2890	1590 - 3640	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	pCi/kg	Americium-241	1260	914	546 - 1170	Not Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	pCi/kg	Plutonium-238	1500	1420	813 - 2000	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	pCi/kg	Plutonium-239	1540	1400	956 - 1860	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	pCi/kg	Uranium-234	671	972	616 - 1210	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	pCi/kg	Uranium-238	783	962	588 - 1220	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	pCi/kg	Uranium-Total	1498	1980	1130 - 2670	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	ug/kg	Uranium-Total(mass)	2350	2890	1590 - 3640	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	ug/kg	Uranium-Total(mass)	1950	2890	1590 - 3640	Acceptable
2nd / 2011	05/11/11	MRAD-14	Vegetation	pCi/kg	Americium-241	3430	3200	1820 - 4400	Acceptable
2nd / 2011	05/11/11	MRAD-14	Vegetation	pCi/kg	Curium-244	829	812	400 - 1260	Acceptable

Quarter / Year	Analysis Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
2nd / 2011	05/11/11	MRAD-14	Vegetation	pCi/kg	Plutonium-239	3000	3100	1920 - 4230	Acceptable
2nd / 2011	05/11/11	MRAD-14	Vegetation	pCi/kg	Uranium-234	2400	2610	1790 - 3460	Acceptable
2nd / 2011	05/11/11	MRAD-14	Vegetation	pCi/kg	Uranium-238	2510	2590	1820 - 3270	Acceptable
2nd / 2011	05/11/11	MRAD-14	Vegetation	pCi/kg	Uranium-Total	5032	5320	3660 - 6860	Acceptable
2nd / 2011	05/11/11	MRAD-14	Vegetation	ug/kg	Uranium-Total(mass)	7530	7760	5340 - 10000	Acceptable
2nd / 2011	05/11/11	MRAD-14	Vegetation	pCi/kg	Americium-241	3760	3200	1820 - 4400	Acceptable
2nd / 2011	05/11/11	MRAD-14	Vegetation	pCi/kg	Cesium-134	829	770	441 - 1070	Acceptable
2nd / 2011	05/11/11	MRAD-14	Vegetation	pCi/kg	Cesium-137	883	829	608 - 1150	Acceptable
2nd / 2011	05/11/11	MRAD-14	Vegetation	pCi/kg	Cobalt-60	795	733	496 - 1050	Acceptable
2nd / 2011	05/11/11	MRAD-14	Vegetation	pCi/kg	Manganese-54	<34.1	0.00	---	Acceptable
2nd / 2011	05/11/11	MRAD-14	Vegetation	pCi/kg	Potassium-40	28300	25800	18500 - 36500	Acceptable
2nd / 2011	05/11/11	MRAD-14	Vegetation	pCi/kg	Zinc-65	1020	799	577 - 1090	Acceptable
2nd / 2011	05/11/11	MRAD-14	Vegetation	pCi/kg	Plutonium-238	2910	2990	1610 - 4380	Acceptable
2nd / 2011	05/11/11	MRAD-14	Vegetation	pCi/kg	Plutonium-239	3000	3100	1920 - 4230	Acceptable
2nd / 2011	05/11/11	MRAD-14	Vegetation	pCi/kg	Strontium-90	7400	7890	4410 - 10500	Acceptable
2nd / 2011	05/11/11	MRAD-14	Filter	pCi/Filter	Americium-241	69.2	62.5	36.6 - 85.7	Acceptable
2nd / 2011	05/11/11	MRAD-14	Filter	pCi/Filter	Plutonium-238	69.3	69.0	47.4 - 90.7	Acceptable
2nd / 2011	05/11/11	MRAD-14	Filter	pCi/Filter	Plutonium-239	65.4	65.5	47.5 - 84.8	Acceptable
2nd / 2011	05/11/11	MRAD-14	Filter	pCi/Filter	Uranium-234	60.3	61.5	38.7 - 91.1	Acceptable
2nd / 2011	05/11/11	MRAD-14	Filter	pCi/Filter	Uranium-238	66.7	61.0	39.0 - 86.6	Acceptable
2nd / 2011	05/11/11	MRAD-14	Filter	pCi/Filter	Uranium-Total	131.1	125	63.9 - 199	Acceptable
2nd / 2011	05/11/11	MRAD-14	Filter	ug/Filter	Uranium-Total(mass)	200	183	114 - 263	Acceptable
2nd / 2011	05/11/11	MRAD-14	Filter	pCi/Filter	Americium-241	74.9	62.5	36.6 - 85.7	Acceptable
2nd / 2011	05/11/11	MRAD-14	Filter	pCi/Filter	Cesium-134	260	279	182 - 345	Acceptable
2nd / 2011	05/11/11	MRAD-14	Filter	pCi/Filter	Cesium-137	320	312	234 - 410	Acceptable
2nd / 2011	05/11/11	MRAD-14	Filter	pCi/Filter	Cobalt-60	426	390	302 - 487	Acceptable
2nd / 2011	05/11/11	MRAD-14	Filter	pCi/Filter	Manganese-54	<4.6	0.00	---	Acceptable
2nd / 2011	05/11/11	MRAD-14	Filter	pCi/Filter	Zinc-65	318	279	193 - 386	Acceptable
2nd / 2011	05/11/11	MRAD-14	Filter	pCi/Filter	Strontium-90	192	185	81.4 - 288	Acceptable
2nd / 2011	05/11/11	MRAD-14	Filter	pCi/Filter	Iron-55	391	385	169 - 599	Acceptable
2nd / 2011	05/11/11	MRAD-14	Filter	ug/Filter	Uranium-Total(mass)	185	183	114 - 263	Acceptable
2nd / 2011	05/11/11	MRAD-14	Filter	pCi/Filter	Uranium-234	54.8	61.5	38.7 - 91.1	Acceptable
2nd / 2011	05/11/11	MRAD-14	Filter	pCi/Filter	Uranium-238	54.4	61.0	39.0 - 86.6	Acceptable
2nd / 2011	05/11/11	MRAD-14	Filter	pCi/Filter	Uranium-Total	109	125	63.9 - 199	Acceptable
2nd / 2011	05/11/11	MRAD-14	Filter	ug/Filter	Uranium-Total(mass)	177	183	114 - 263	Acceptable
2nd / 2011	05/11/11	MRAD-14	Filter	pCi/Filter	Gross Alpha	<5.00	74.3	38.5 - 112	Not Acceptable
2nd / 2011	05/11/11	MRAD-14	Filter	pCi/Filter	Gross Beta	34.1	69.5	42.8 - 102	Not Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Uranium-234	87.1	94.3	71.1 - 122	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Uranium-238	81.0	93.5	71.4 - 116	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Uranium-Total	168.1	192	138 - 256	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	ug/L	Uranium-Total(mass)	241	280	219 - 346	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Americium-241	137	135	92.5 - 182	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Plutonium-238	116	131	99.1 - 162	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Plutonium-239	101	119	92.1 - 147	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Uranium-234	88.5	94.3	71.1 - 122	Acceptable

Quarter / Year	Analysis Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Uranium-Total	180.7	192	138 - 256	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	ug/L	Uranium-Total(mass)	264	280	219 - 346	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Americium-241	140	135	92.5 - 182	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Cesium-134	222	231	171 - 265	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Cesium-137	430	417	354 - 500	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Cobalt-60	430	411	358 - 486	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Manganese-54	<5.17	0.00	---	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Zinc-65	131	111	94.1 - 138	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Strontium-90	782	773	491 - 1030	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Uranium-234	100	94.3	71.1 - 122	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Uranium-238	88.7	93.5	71.4 - 116	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Uranium-Total	188.7	192	138 - 256	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	ug/L	Uranium-Total(mass)	264	280	219 - 346	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Iron-55	245	437	254 - 584	Not Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Gross Alpha	99.7	112	49.7 - 166	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Gross Beta	103	99.8	58.4 - 146	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Tritium	13300	15200	9900 - 22500	Acceptable
2nd / 2011	06/14/11	052011J	Water	pCi/L	Barium-133	76.6	75.3	63.0 - 82.8	Acceptable
2nd / 2011	06/14/11	052011J	Water	pCi/L	Cesium-134	71.3	72.9	59.5 - 80.2	Acceptable
2nd / 2011	06/14/11	052011J	Water	pCi/L	Cesium-137	78.8	77.0	69.3 - 87.4	Acceptable
2nd / 2011	06/14/11	052011J	Water	pCi/L	Cobalt-60	92.7	88.8	79.9 - 100	Acceptable
2nd / 2011	06/14/11	052011J	Water	pCi/L	Zinc-65	118	98.9	89.0 - 118	Acceptable
2nd / 2011	07/25/11	E7859-278	Cartridge	pCi	Iodine-131	8.17E+01	8.65E+01	0.95	Acceptable
2nd / 2011	07/25/11	E7860-278	Milk	pCi/L	Strontium-89	9.68E+01	1.03E+02	0.94	Acceptable
2nd / 2011	07/25/11	E7860-278	Milk	pCi/L	Strontium-90	1.58E+01	1.56E+01	1.01	Acceptable
2nd / 2011	07/25/11	E7861-278	Milk	pCi/L	Iodine-131	9.00E+01	1.03E+02	0.87	Acceptable
2nd / 2011	07/25/11	E7861-278	Milk	pCi/L	Cerium-141	8.36E+01	7.99E+01	1.05	Acceptable
2nd / 2011	07/25/11	E7861-278	Milk	pCi/L	Chromium-51	2.39E+02	2.06E+02	1.16	Acceptable
2nd / 2011	07/25/11	E7861-278	Milk	pCi/L	Cesium-134	1.71E+02	1.90E+02	0.90	Acceptable
2nd / 2011	07/25/11	E7861-278	Milk	pCi/L	Cesium-137	1.43E+02	1.38E+02	1.04	Acceptable
2nd / 2011	07/25/11	E7861-278	Milk	pCi/L	Cobalt-58	1.50E+02	1.52E+02	0.99	Acceptable
2nd / 2011	07/25/11	E7861-278	Milk	pCi/L	Manganese-54	1.32E+02	1.38E+02	0.96	Acceptable
2nd / 2011	07/25/11	E7861-278	Milk	pCi/L	Iron-59	1.43E+02	1.23E+02	1.16	Acceptable
2nd / 2011	07/25/11	E7861-278	Milk	pCi/L	Zinc-65	2.76E+02	2.61E+02	1.06	Acceptable
2nd / 2011	07/25/11	E7861-278	Milk	pCi/L	Cobalt-60	1.92E+02	1.95E+02	0.99	Acceptable
2nd / 2011	07/25/11	E7862-278	Water	pCi/L	Iodine-131	1.20E+02	1.01E+02	1.19	Acceptable
2nd / 2011	07/25/11	E7862-278	Water	pCi/L	Cerium-141	9.30E+01	9.35E+01	0.99	Acceptable
2nd / 2011	07/25/11	E7862-278	Water	pCi/L	Chromium-51	3.36E+02	2.41E+02	1.39	Not Acceptable
2nd / 2011	07/25/11	E7862-278	Water	pCi/L	Cesium-134	2.02E+02	2.22E+02	0.91	Acceptable
2nd / 2011	07/25/11	E7862-278	Water	pCi/L	Cesium-137	1.73E+02	1.61E+02	1.07	Acceptable
2nd / 2011	07/25/11	E7862-278	Water	pCi/L	Cobalt-58	1.75E+02	1.77E+02	0.99	Acceptable
2nd / 2011	07/25/11	E7862-278	Water	pCi/L	Manganese-54	1.66E+02	1.61E+02	1.03	Acceptable
2nd / 2011	07/25/11	E7862-278	Water	pCi/L	Iron-59	1.57E+02	1.44E+02	1.09	Acceptable
2nd / 2011	07/25/11	E7862-278	Water	pCi/L	Zinc-65	3.47E+02	3.05E+02	1.14	Acceptable
2nd / 2011	07/25/11	E7862-278	Water	pCi/L	Cobalt-60	2.38E+02	2.28E+02	1.05	Acceptable

Quarter / Year	Analysis Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
3rd / 2011	08/11/11	071111J	Filter	pCi/Filter	Gross Beta	84.7	92.2	56.8 - 92.2	Acceptable
3rd / 2011	08/11/11	071111J	Soil	pCi/kg	Americium-241	2130	1660	992 - 2130	Acceptable
3rd / 2011	08/11/11	071111J	Soil	pCi/kg	Actinium-228	1300	1330	860 - 1880	Acceptable
3rd / 2011	08/11/11	071111J	Soil	pCi/kg	Bismuth-212	1460	1550	406 - 2310	Acceptable
3rd / 2011	08/11/11	071111J	Soil	pCi/kg	Bismuth-214	1430	1420	872 - 2050	Acceptable
3rd / 2011	08/11/11	071111J	Soil	pCi/kg	Cesium-134	6000	5170	3330 - 6220	Acceptable
3rd / 2011	08/11/11	071111J	Soil	pCi/kg	Cesium-137	6190	4970	3800 - 6460	Acceptable
3rd / 2011	08/11/11	071111J	Soil	pCi/kg	Cobalt-60	9680	7520	5470 - 10100	Acceptable
3rd / 2011	08/11/11	071111J	Soil	pCi/kg	Lead-212	1300	1260	820 - 1780	Acceptable
3rd / 2011	08/11/11	071111J	Soil	pCi/kg	Lead-214	1700	1510	902 - 2260	Acceptable
3rd / 2011	08/11/11	071111J	Soil	pCi/kg	Manganese-54	<263	0.00	---	Acceptable
3rd / 2011	08/11/11	071111J	Soil	pCi/kg	Potassium-40	10200	11200	8060 - 15100	Acceptable
3rd / 2011	08/11/11	071111J	Soil	pCi/kg	Thorium-234	1460	1590	500 - 3020	Acceptable
3rd / 2011	08/11/11	071111J	Soil	pCi/kg	Zinc-65	2910	1940	1540 - 2600	Not Acceptable
3rd / 2011	08/11/11	071111J	Soil	pCi/kg	Strontium-90	8390	5750	2080 - 9380	Acceptable
3rd / 2011	08/11/11	071111J	Water	pCi/L	Iron-55	426	588	342 - 785	Acceptable
3rd / 2011	08/18/11	RAD-86	Water	pCi/L	Gross Alpha	44.2	71.5	37.6 - 88.2	Acceptable
3rd / 2011	08/18/11	RAD-86	Water	pCi/L	Gross Beta	58.4	63.4	43.8 - 70.0	Acceptable
3rd / 2011	08/18/11	RAD-86	Water	pCi/L	Gross Alpha	53.1	71.5	37.6 - 88.2	Acceptable
3rd / 2011	08/18/11	RAD-86	Water	pCi/L	Tritium	7200	7620	6600 - 8370	Acceptable
3rd / 2011	08/18/11	RAD-86	Water	pCi/L	Strontium-89	51.9	52.3	41.4 - 59.8	Acceptable
3rd / 2011	08/18/11	RAD-86	Water	pCi/L	Strontium-90	20.3	26.4	19.1 - 30.8	Acceptable
3rd / 2011	08/18/11	RAD-86	Water	pCi/L	Iodine-131	35.4	26.0	21.6 - 30.7	Not Acceptable
3rd / 2011	09/02/11	RAD-800	Water	pCi/L	Barium-133	55.3	51.6	42.5 - 57.2	Acceptable
3rd / 2011	09/02/11	RAD-800	Water	pCi/L	Cesium-134	77.9	84.1	68.9 - 92.5	Acceptable
3rd / 2011	09/02/11	RAD-800	Water	pCi/L	Cesium-137	111	109	98.1 - 122	Acceptable
3rd / 2011	09/02/11	RAD-800	Water	pCi/L	Cobalt-60	110	109	98.1 - 122	Acceptable
3rd / 2011	09/02/11	RAD-800	Water	pCi/L	Zinc-65	63.4	52.8	46.3 - 64.8	Acceptable
3rd / 2011	09/02/11	RAD-800	Water	pCi/L	Radium-226	14.3	14.6	10.9 - 16.8	Acceptable
3rd / 2011	09/02/11	RAD-800	Water	pCi/L	Radium-228	12.6	13.2	8.75 - 16.1	Acceptable
3rd / 2011	09/02/11	RAD-800	Water	pCi/L	Uranium (Nat)	50.7	51.2	41.6 - 56.9	Acceptable
3rd / 2011	09/02/11	RAD-800	Water	ug/L	Uranium (Nat) mass	71.7	74.7	60.6 - 83.0	Acceptable
3rd / 2011	09/02/11	RAD-800	Water	pCi/L	Radium-226	14.1	14.6	10.9 - 16.8	Acceptable
3rd / 2011	09/02/11	RAD-800	Water	pCi/L	Radium-228	12.5	13.2	8.75 - 16.1	Acceptable
3rd / 2011	09/02/11	RAD-800	Water	pCi/L	Uranium (Nat)	52.2	51.2	41.6 - 56.9	Acceptable
3rd / 2011	09/02/11	RAD-800	Water	ug/L	Uranium (Nat) mass	77.9	74.7	60.6 - 83.0	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaS24	Soil	mg/kg	Americium-241	64.93	61.1	42.8 - 79.4	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaS24	Soil	mg/kg	Cesium-134	686.5	680	476 - 884	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaS24	Soil	mg/kg	Cesium-137	783	758	531 - 985	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaS24	Soil	mg/kg	Cobalt-57	898.5	927	649 - 1205	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaS24	Soil	mg/kg	Cobalt-60	493.5	482	337 - 627	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaS24	Soil	mg/kg	Iron-55	245	387	271 - 503	Not Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaS24	Soil	mg/kg	Nickel-63	440.3	582	407 - 757	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaS24	Soil	mg/kg	Plutonium-239/240	90.87	98.0	68.6 - 127.4	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaS24	Soil	mg/kg	Potassium-40	588	540	378 - 702	Acceptable

Quarter / Year	Analysis Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
3rd / 2011	05/07/11	MAPEP-11-MaS24	Soil	mg/kg	Uranium-234/233	175.33	176	123 - 229	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaS24	Soil	mg/kg	Uranium-238	195.67	184	129 - 239	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaS24	Soil	mg/kg	Zinc-65	1515	1359	951 - 1767	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaW24	Water	Bq/L	Americium-241	0.4877	0.529	0.370 - 0.688	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaW24	Water	Bq/L	Cesium-134	19.60	21.5	15.1 - 28.0	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaW24	Water	Bq/L	Cesium-137	29.9	29.4	20.6 - 38.2	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaW24	Water	Bq/L	Cobalt-60	24.75	24.6	17.2 - 32.0	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaW24	Water	Bq/L	Hydrogen-3	225.3	243	170 - 316	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaW24	Water	Bq/L	Iron-55	14.10	26.4	18.5 - 34.3	Not Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaW24	Water	Bq/L	Manganese-54	32.9	31.6	22.1 - 41.1	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaW24	Water	Bq/L	Nickel-63	19.2	18.6	13.0 - 24.2	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaW24	Water	Bq/L	Plutonium-238	1.005	1.064	0.745 - 1.383	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaW24	Water	Bq/L	Plutonium-239/240	0.755	0.809	0.566 - 1.052	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaW24	Water	Bq/L	Potassium-40	99.8	91	64 - 118	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaW24	Water	Bq/L	Strontium-90	8.05	8.72	6.10 - 11.34	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaW24	Water	Bq/L	Technetium-99	8.6	8.99	6.29 - 11.69	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaW24	Water	Bq/L	Uranium-234/233	1.537	1.50	1.05 - 1.95	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaW24	Water	Bq/L	Uranium-238	1.457	1.54	1.08 - 2.00	Acceptable
3rd / 2011	05/07/11	MAPEP-11-GrW24	Water	Bq/L	Gross Alpha	1.019	1.136	0.341 - 1.931	Acceptable
3rd / 2011	05/07/11	MAPEP-11-GrW24	Water	Bq/L	Gross Beta	3.140	2.96	1.48 - 4.44	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdF24	Filter	ug/sample	Uranium-235	0.108	0.106	0.074 - 0.138	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdF24	Filter	ug/sample	Uranium-238	14.4	14.9	10.4 - 19.4	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdF24	Filter	ug/sample	Uranium-Total	14.4	15.0	10.5 - 19.5	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdF24	Filter	Bq/sample	Cesium-134	3.39	3.49	2.44 - 4.54	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdF24	Filter	Bq/sample	Cesium-137	2.375	2.28	1.60 - 2.96	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdF24	Filter	Bq/sample	Cobalt-57	3.60	3.33	2.33 - 4.33	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdF24	Filter	Bq/sample	Manganese-54	2.975	2.64	1.85 - 3.43	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdF24	Filter	Bq/sample	Plutonium-238	0.092	0.096	0.067 - 0.125	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdF24	Filter	Bq/sample	Plutonium-239/240	0.073	0.0765	.0536 - .0995	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdF24	Filter	Bq/sample	Strontium-90	1.373	1.36	0.95 - 1.77	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdF24	Filter	Bq/sample	Uranium-234/233	0.184	0.178	0.125 - 0.231	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdF24	Filter	Bq/sample	Uranium-238	0.183	0.185	0.130 - 0.241	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdF24	Filter	Bq/sample	Zinc-65	3.470	3.18	2.23 - 4.13	Acceptable
3rd / 2011	05/07/11	MAPEP-11-GrF24	Filter	Bq/sample	Gross Alpha	0.102	0.659	0.198 - 1.120	Not Acceptable
3rd / 2011	05/07/11	MAPEP-11-GrF24	Filter	Bq/sample	Gross Beta	1.210	1.32	0.662 - 1.985	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdV24	Vegetation	Bq/sample	Cesium-134	5.120	5.50	3.85 - 7.15	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdV24	Vegetation	Bq/sample	Cobalt-57	9.835	9.94	6.96 - 12.92	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdV24	Vegetation	Bq/sample	Cobalt-60	5.060	4.91	3.44 - 6.38	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdV24	Vegetation	Bq/sample	Manganese-54	6.405	6.40	4.48 - 8.32	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdV24	Vegetation	Bq/sample	Plutonium-238	0.110	0.102	0.071 - 0.133	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdV24	Vegetation	Bq/sample	Plutonium-239/240	0.1277	0.141	0.099 - 0.183	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdV24	Vegetation	Bq/sample	Strontium-90	2.430	2.46	1.72 - 3.20	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdV24	Vegetation	Bq/sample	Uranium-234/233	0.158	0.163	0.114 - 0.212	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdV24	Vegetation	Bq/sample	Uranium-238	0.159	0.168	0.118 - 0.218	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdV24	Vegetation	Bq/sample	Zinc-65	3.275	2.99	2.09 - 3.89	Acceptable

Quarter / Year	Analysis Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
4th / 2011	10/25/11	RAD-87	Liquid	pCi/L	Iodine-131	28.7	27.5	22.9 - 32.3	Acceptable
3rd / 2011	10/19/11	E8095-278	Cartridge	pCi	Iodine-131	7.69E+01	8.02E+01	0.96	Acceptable
3rd / 2011	10/19/11	E8096-278	Milk	pCi/L	Strontium-89	9.51E+01	9.08E+01	1.05	Acceptable
3rd / 2011	10/19/11	E8096-278	Milk	pCi/L	Strontium-90	8.49E+00	1.47E+01	0.58	Not Acceptable
3rd / 2011	10/19/11	E8097-278	Milk	pCi/L	Iodine-131	8.59E+01	8.92E+01	0.96	Acceptable
3rd / 2011	10/19/11	E8097-278	Milk	pCi/L	Cerium-141	6.59E+01	6.67E+01	0.99	Acceptable
3rd / 2011	10/19/11	E8097-278	Milk	pCi/L	Chromium-51	2.18E+02	2.26E+02	0.96	Acceptable
3rd / 2011	10/19/11	E8097-278	Milk	pCi/L	Cesium-134	1.20E+02	1.28E+02	0.94	Acceptable
3rd / 2011	10/19/11	E8097-278	Milk	pCi/L	Cesium-137	1.23E+02	1.14E+02	1.08	Acceptable
3rd / 2011	10/19/11	E8097-278	Milk	pCi/L	Cobalt-58	9.08E+01	9.75E+01	0.93	Acceptable
3rd / 2011	10/19/11	E8097-278	Milk	pCi/L	Manganese-54	1.57E+02	1.51E+02	1.04	Acceptable
3rd / 2011	10/19/11	E8097-278	Milk	pCi/L	Iron-59	5.30E+01	5.48E+01	0.97	Acceptable
3rd / 2011	10/19/11	E8097-278	Milk	pCi/L	Zinc-65	1.88E+02	1.80E+02	1.04	Acceptable
3rd / 2011	10/19/11	E8097-278	Milk	pCi/L	Cobalt-60	1.51E+02	1.57E+02	0.96	Acceptable
3rd / 2011	10/19/11	E8098-278	Water	pCi/L	Iodine-131	7.23E+01	8.01E+01	0.9	Acceptable
3rd / 2011	10/19/11	E8098-278	Water	pCi/L	Cerium-141	9.06E+01	9.15E+01	0.99	Acceptable
3rd / 2011	10/19/11	E8098-278	Water	pCi/L	Chromium-51	3.19E+02	3.10E+02	1.03	Acceptable
3rd / 2011	10/19/11	E8098-278	Water	pCi/L	Cesium-134	1.57E+02	1.76E+02	0.89	Acceptable
3rd / 2011	10/19/11	E8098-278	Water	pCi/L	Cesium-137	1.60E+02	1.56E+02	1.03	Acceptable
3rd / 2011	10/19/11	E8098-278	Water	pCi/L	Cobalt-58	1.34E+02	1.34E+02	1.00	Acceptable
3rd / 2011	10/19/11	E8098-278	Water	pCi/L	Manganese-54	2.19E+02	2.07E+02	1.06	Acceptable
3rd / 2011	10/19/11	E8098-278	Water	pCi/L	Iron-59	9.04E+01	7.52E+01	1.20	Acceptable
3rd / 2011	10/19/11	E8098-278	Water	pCi/L	Zinc-65	2.74E+02	2.47E+02	1.11	Acceptable
3rd / 2011	10/19/11	E8098-278	Water	pCi/L	Cobalt-60	2.25E+02	2.15E+02	1.04	Acceptable
4th / 2011	11/21/11	MAPEP-11-MaS25	Soil	Bq/kg	Cesium-137	990.5	979	685 - 1273	Acceptable
4th / 2011	11/21/11	MAPEP-11-MaS25	Soil	Bq/kg	Cobalt-57	1140	1180	826 - 1534	Acceptable
4th / 2011	11/21/11	MAPEP-11-MaS25	Soil	Bq/kg	Cobalt-60	665.5	644	451 - 837	Acceptable
4th / 2011	11/21/11	MAPEP-11-MaS25	Soil	Bq/kg	Iron-55	1206.7	1000	700 - 1300	Acceptable
4th / 2011	11/21/11	MAPEP-11-MaS25	Soil	Bq/kg	Manganese-54	897.5	848	594 - 1102	Acceptable
4th / 2011	11/21/11	MAPEP-11-MaS25	Soil	Bq/kg	Plutonium-238	90.9	93.6	65.5 - 121.7	Acceptable
4th / 2011	11/21/11	MAPEP-11-MaS25	Soil	Bq/kg	Plutonium-239/240	76.6	77.4	54.2 - 100.6	Acceptable
4th / 2011	11/21/11	MAPEP-11-MaS25	Soil	Bq/kg	Potassium-40	692	625	438 - 813	Acceptable
4th / 2011	11/21/11	MAPEP-11-MaS25	Soil	Bq/kg	Strontium-90	333.3	320	224 - 416	Acceptable
4th / 2011	11/21/11	MAPEP-11-MaS25	Soil	Bq/kg	Technetium-99	166	182	127 - 237	Acceptable
4th / 2011	11/21/11	MAPEP-11-MaS25	Soil	Bq/kg	Uranium-234/233	273.67	263	184 - 342	Acceptable
4th / 2011	11/21/11	MAPEP-11-MaS25	Soil	Bq/kg	Uranium-238	287.33	274	192 - 356	Acceptable
4th / 2011	11/21/11	MAPEP-11-MaS25	Soil	Bq/kg	Zinc-65	1770	1560	1092 - 2028	Acceptable
4th / 2011	11/16/11	MAPEP-11-MaW25	Water	Bq/L	Americium-241	3.0667	3.18	2.23 - 4.13	Acceptable
4th / 2011	11/16/11	MAPEP-11-MaW25	Water	Bq/L	Cesium-134	16.95	19.1	13.4 - 24.8	Acceptable
4th / 2011	11/16/11	MAPEP-11-MaW25	Water	Bq/L	Cobalt-57	38.05	36.6	25.6 - 47.6	Acceptable
4th / 2011	11/16/11	MAPEP-11-MaW25	Water	Bq/L	Cobalt-60	30.45	29.3	20.5 - 38.1	Acceptable
4th / 2011	11/16/11	MAPEP-11-MaW25	Water	Bq/L	Hydrogen-3	965.7	1014	710 - 1318	Acceptable
4th / 2011	11/16/11	MAPEP-11-MaW25	Water	Bq/L	Manganese-54	26.95	25.0	17.5 - 32.5	Acceptable
4th / 2011	11/16/11	MAPEP-11-MaW25	Water	Bq/L	Plutonium-239/240	2.247	2.4	1.68 - 3.12	Acceptable
4th / 2011	11/16/11	MAPEP-11-MaW25	Water	Bq/L	Potassium-40	171.5	156	109 - 203	Acceptable
4th / 2011	11/16/11	MAPEP-11-MaW25	Water	Bq/L	Strontium-90	14.47	14.2	9.9 - 18.5	Acceptable

Quarter / Year	Analysis Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
4th / 2011	11/21/11	MAPEP-11-MaW25	Water	Bq/L	Uranium-238	2.787	2.89	2.02 - 3.76	Acceptable
4th / 2011	11/21/11	MAPEP-11-MaW25	Water	Bq/L	Zinc-65	32.7	28.5	20.0 - 37.1	Acceptable
4th / 2011	11/21/11	MAPEP-11-GrW25	Water	Bq/L	Gross Alpha	0.876	0.866	0.260 - 1.472	Acceptable
4th / 2011	11/21/11	MAPEP-11-GrW25	Water	Bq/L	Gross Beta	5.003	4.81	2.41 - 7.22	Acceptable
4th / 2011	11/21/11	MAPEP-11-RdF25	Filter	uq/sample	Uranium-235	0.0927	0.0966	.0676 -.1256	Acceptable
4th / 2011	11/21/11	MAPEP-11-RdF25	Filter	uq/sample	Uranium-238	12.9	13.7	9.6 - 17.8	Acceptable
4th / 2011	11/21/11	MAPEP-11-RdF25	Filter	uq/sample	Uranium-Total	13	13.8	9.7 - 17.9	Acceptable
4th / 2011	11/21/11	MAPEP-11-RdF25	Filter	Bq/sample	Americium-241	0.1097	0.147	0.103 - 0.191	Acceptable
4th / 2011	11/21/11	MAPEP-11-RdF25	Filter	Bq/sample	Cesium-137	1.945	2.6	1.82 - 3.38	Acceptable
4th / 2011	11/21/11	MAPEP-11-RdF25	Filter	Bq/sample	Cobalt-57	4.23	5.09	3.56 - 6.62	Acceptable
4th / 2011	11/21/11	MAPEP-11-RdF25	Filter	Bq/sample	Cobalt-60	2.525	3.2	2.24 - 4.16	Acceptable
4th / 2011	11/21/11	MAPEP-11-RdF25	Filter	Bq/sample	Plutonium-238	0.096	0.1183	.0828 -.1538	Acceptable
4th / 2011	11/21/11	MAPEP-11-RdF25	Filter	Bq/sample	Plutonium-239/240	0.094	0.135	0.095 - 0.176	Not Acceptable
4th / 2011	11/21/11	MAPEP-11-RdF25	Filter	Bq/sample	Strontium-90	1.213	1.67	1.17 - 2.17	Acceptable
4th / 2011	11/21/11	MAPEP-11-RdF25	Filter	Bq/sample	Uranium-234/233	0.116	0.162	0.113 - 0.211	Acceptable
4th / 2011	11/21/11	MAPEP-11-RdF25	Filter	Bq/sample	Uranium-238	0.105	0.168	0.118 - 0.218	Not Acceptable
4th / 2011	11/21/11	MAPEP-11-RdF25	Filter	Bq/sample	Zinc-65	3.355	4.11	2.88 - 5.34	Acceptable
4th / 2011	11/21/11	MAPEP-11-GrF25	Filter	Bq/sample	Gross Alpha	0.0037	-	False Positive	Not Acceptable
4th / 2011	11/21/11	MAPEP-11-GrF25	Filter	Bq/sample	Gross Beta	0.027	-	False Positive	Not Acceptable
4th / 2011	11/16/11	MAPEP-11-RdV25	Vegetation	Bq/sample	Americium-241	0.205	0.222	0.155 - 0.289	Acceptable
4th / 2011	11/16/11	MAPEP-11-RdV25	Vegetation	Bq/sample	Cesium-137	4.72	4.71	3.30 - 6.12	Acceptable
4th / 2011	11/16/11	MAPEP-11-RdV25	Vegetation	Bq/sample	Cobalt-60	3.48	3.38	2.37 - 4.39	Acceptable
4th / 2011	11/16/11	MAPEP-11-RdV25	Vegetation	Bq/sample	Manganese-54	5.925	5.71	4.00 - 7.42	Acceptable
4th / 2011	11/16/11	MAPEP-11-RdV25	Vegetation	Bq/sample	Plutonium-238	0.111	0.124	0.087 - 0.161	Acceptable
4th / 2011	11/16/11	MAPEP-11-RdV25	Vegetation	Bq/sample	Strontium-90	1.38	1.26	0.88 - 1.64	Acceptable
4th / 2011	11/16/11	MAPEP-11-RdV25	Vegetation	Bq/sample	Uranium-234/233	0.352	0.357	0.250 - 0.464	Acceptable
4th / 2011	11/16/11	MAPEP-11-RdV25	Vegetation	Bq/sample	Uranium-238	0.337	0.37	0.259 - 0.481	Acceptable
4th / 2011	11/16/11	MAPEP-11-RdV25	Vegetation	Bq/sample	Zinc-65	6.63	6.39	4.47 - 8.31	Acceptable
4th / 2011	11/16/11	MAPEP-11-XaW25	Water	Bq/sample	Iodine-129	8.723	9.5	6.7 - 12.4	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Uranium-234	2502	2530	1600 - 3140	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Uranium-238	2347	2560	1560 - 3250	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Uranium-Total	4849	5190	2960 - 7010	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	ug/kg	Uranium-Total (mass)	6980	7570	4160 - 9520	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Americium-241	1360	1210	723 - 1550	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Plutonium-238	1290	1240	710 - 1750	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Plutonium-239	1570	1440	983 - 1910	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Uranium-234	2520	2530	1600 - 3104	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Uranium-238	2670	2560	1560 - 3250	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Uranium-Total	5304	5190	2960 - 7010	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	ug/kg	Uranium-Total (mass)	8000	7570	4160 - 9520	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Actinium-228	1250	1350	866 - 1900	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Bismuth-212	1500	1400	368 - 2090	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Bismuth-214	1860	1420	872 - 2040	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Cesium-134	4750	4120	2650 - 4960	Acceptable

Quarter / Year	Analysis Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Cobalt-60	6230	5350	3890 - 7180	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Lead-212	1520	1310	845 - 1840	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Lead-214	2090	1380	826 - 2050	Not Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Manganese-54	< 46.2	< 1000	0.00 - 1000	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Potassium-40	10200	12500	9060 - 16900	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Thorium-234	2960	2560	813 - 4880	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Zinc-65	4590	3760	2980 - 5040	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Strontium-90	6210	5780	2090 - 9430	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Uranium-234	2640	2530	1600 - 3140	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Uranium-238	2450	2560	1560 - 3250	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Uranium-Total	5200	5190	2960 - 7010	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	ug/kg	Uranium-Total (mass)	7286	7570	4160 - 9520	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	ug/kg	Uranium-Total (mass)	7430	7570	4160 - 9520	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Americium-241	3040	2980	1700 - 4090	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Curium-244	697	642	316 - 1000	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Plutonium-238	3000	2880	1560 - 4220	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Plutonium-239	2910	2980	1850 - 4060	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Uranium-234	2580	2420	1660 - 3210	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Uranium-238	2660	2400	1690 - 3030	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Uranium-Total	5356	4920	3330 - 6120	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	ug/kg	Uranium-Total (mass)	7970	7180	4810 - 9120	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Cesium-134	1480	1380	790 - 1910	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Cesium-137	1570	1270	932 - 1760	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Cobalt-60	1800	1500	1010 - 2160	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Manganese-54	< 44.0	< 300	0.00 - 300	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Potassium-40	32100	28800	20700 - 40800	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Zinc-65	3470	2770	2000 - 3790	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Strontium-90	6320	5440	3040 - 7220	Acceptable
4th / 2011	10/31/11	MRAD-15	Filter	pCi/Filter	Americium-241	63.4	76.0	44.5 - 104	Acceptable
4th / 2011	10/31/11	MRAD-15	Filter	pCi/Filter	Plutonium-238	62.5	71.2	48.9 - 93.6	Acceptable
4th / 2011	10/31/11	MRAD-15	Filter	pCi/Filter	Plutonium-239	65.5	69.0	50.0 - 89.4	Acceptable
4th / 2011	10/31/11	MRAD-15	Filter	pCi/Filter	Uranium-234	66.8	74.2	46.7 - 110	Acceptable
4th / 2011	10/31/11	MRAD-15	Filter	pCi/Filter	Uranium-238	68.8	73.5	47.0 - 104	Acceptable
4th / 2011	10/31/11	MRAD-15	Filter	pCi/Filter	Uranium-Total	139	151	77.2 - 240	Acceptable
4th / 2011	10/31/11	MRAD-15	Filter	ug/Filter	Uranium-Total (mass)	206	220	137 - 316	Acceptable
4th / 2011	10/31/11	MRAD-15	Filter	pCi/Filter	Cesium-134	376	429	279 - 531	Acceptable
4th / 2011	10/31/11	MRAD-15	Filter	pCi/Filter	Cesium-137	465	486	365 - 638	Acceptable
4th / 2011	10/31/11	MRAD-15	Filter	pCi/Filter	Cobalt-60	496	524	405 - 655	Acceptable
4th / 2011	10/31/11	MRAD-15	Filter	pCi/Filter	Manganese-54	< 5.31	< 50.0	0.00 - 50.0	Acceptable
4th / 2011	10/31/11	MRAD-15	Filter	pCi/Filter	Zinc-65	471	464	321 - 643	Acceptable
4th / 2011	10/31/11	MRAD-15	Filter	pCi/Filter	Strontium-90	106	112	49.3 - 174	Acceptable
4th / 2011	10/31/11	MRAD-15	Filter	pCi/Filter	Uranium-Total (mass)	184	220	137 - 316	Acceptable
4th / 2011	10/31/11	MRAD-15	Filter	pCi/Filter	Gross Alpha	81.2	58.4	30.3 - 87.8	Acceptable
4th / 2011	10/31/11	MRAD-15	Filter	pCi/Filter	Gross Beta	56.0	48.9	30.1 - 71.4	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	pCi/L	Uranium-234	80.9	94.4	71.2 - 122	Acceptable

Quarter / Year	Analysis Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
4th / 2011	10/31/11	MRAD-15	Water	pCi/L	Uranium-Total	169	192	138 - 256	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	ug/L	Uranium-Total (mass)	263	281	220 - 347	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	pCi/L	Americium-241	135	135	92.5 - 182	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	pCi/L	Plutonium-238	122	130	98.3 - 161	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	pCi/L	Plutonium-239	112	121	93.6 - 150	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	pCi/L	Uranium-234	85.4	94.4	71.2 - 122	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	pCi/L	Uranium-238	90.5	93.6	71.5 - 116	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	pCi/L	Uranium-Total	182	192	138 - 256	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	ug/L	Uranium-Total (mass)	272	281	220 - 347	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	pCi/L	Cesium-134	293	323	239 - 371	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	pCi/L	Cesium-137	423	421	358 - 504	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	pCi/L	Cobalt-60	505	486	423 - 574	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	pCi/L	Manganese-54	< 6.58	< 100	0.00 - 100	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	pCi/L	Zinc-65	349	315	267 - 393	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	pCi/L	Strontium-90	846	795	505 - 1060	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	pCi/L	Uranium-234	99.5	94.4	71.2 - 122	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	pCi/L	Uranium-238	94.4	93.6	71.5 - 116	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	pCi/L	Uranium-Total	194	192	138 - 256	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	ug/L	Uranium-Total (mass)	281	281	220 - 347	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	pCi/L	Iron-55	667	564	328 - 753	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	pCi/L	Gross Alpha	48.2	68.9	30.6 - 102	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	pCi/L	Gross Beta	45.5	51.7	30.2 - 75.8	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	pCi/L	Tritium	19900	21300	13900 - 31500	Acceptable
4th / 2011	01/12/12	E8197-278	Cartridge	pCi	Iodine-131	9.52E+01	9.82E+01	1.07	Acceptable
4th / 2011	01/12/12	E8198-278	Milk	pCi/L	Strontium-89	8.78E+01	8.96E+01	0.98	Acceptable
4th / 2011	01/12/12	E8198-278	Milk	pCi/L	Strontium-90	1.51E+01	1.48E+01	1.02	Acceptable
4th / 2011	01/12/12	E8199-278	Milk	pCi/L	Iodine-131	9.36E+01	9.02E+01	1.04	Acceptable
4th / 2011	01/12/12	E8199-278	Milk	pCi/L	Chromium-51	5.53E+02	5.66E+02	0.98	Acceptable
4th / 2011	01/12/12	E8199-278	Milk	pCi/L	Cesium-134	1.59E+02	1.71E+02	0.93	Acceptable
4th / 2011	01/12/12	E8199-278	Milk	pCi/L	Cesium-137	2.27E+02	2.10E+02	1.08	Acceptable
4th / 2011	01/12/12	E8199-278	Milk	pCi/L	Cobalt-58	2.18E+02	2.21E+02	0.99	Acceptable
4th / 2011	01/12/12	E8199-278	Milk	pCi/L	Manganese-54	2.52E+02	2.41E+02	1.05	Acceptable
4th / 2011	01/12/12	E8199-278	Milk	pCi/L	Iron-59	1.90E+02	1.83E+02	1.04	Acceptable
4th / 2011	01/12/12	E8199-278	Milk	pCi/L	Zinc-65	3.19E+02	2.91E+02	1.09	Acceptable
4th / 2011	01/12/12	E8199-278	Milk	pCi/L	Cobalt-60	2.82E+02	2.70E+02	1.04	Acceptable
4th / 2011	01/12/12	E8200-278	Water	pCi/L	Iodine-131	8.44E+01	8.87E+01	0.95	Acceptable
4th / 2011	01/12/12	E8200-278	Water	pCi/L	Chromium-51	5.32E+02	5.66E+02	0.94	Acceptable
4th / 2011	01/12/12	E8200-278	Water	pCi/L	Cesium-134	1.56E+02	1.71E+02	0.91	Acceptable
4th / 2011	01/12/12	E8200-278	Water	pCi/L	Cesium-137	2.06E+02	2.10E+02	0.98	Acceptable
4th / 2011	01/12/12	E8200-278	Water	pCi/L	Cobalt-58	2.02E+02	2.21E+02	0.92	Acceptable
4th / 2011	01/12/12	E8200-278	Water	pCi/L	Manganese-54	2.50E+02	2.41E+02	1.04	Acceptable
4th / 2011	01/12/12	E8200-278	Water	pCi/L	Iron-59	1.81E+02	1.83E+02	0.99	Acceptable
4th / 2011	01/12/12	E8200-278	Water	pCi/L	Zinc-65	2.95E+02	2.91E+02	1.01	Acceptable
4th / 2011	01/12/12	E8200-278	Water	pCi/L	Cobalt-60	2.58E+02	2.70E+02	0.96	Acceptable

TABLE 2

2011 ECKERT & ZIEGLER ANALYTICS PERFORMANCE EVALUATION RESULTS

Quarter / Year	Analysis Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
1st / 2011	01/11/11	E7465-278	Cartridge	pCi	Iodine-131	1.03E+02	9.47E+01	1.09	Acceptable
1st / 2011	01/11/11	E7466-278	Milk	pCi/L	Strontium-89	9.23E+01	9.74E+01	0.95	Acceptable
1st / 2011	01/11/11	E7466-278	Milk	pCi/L	Strontium-90	1.27E+01	1.58E+01	0.80	Acceptable
1st / 2011	01/11/11	E7467-278	Milk	pCi/L	Iodine-131	1.00E+02	9.69E+01	1.03	Acceptable
1st / 2011	01/11/11	E7467-278	Milk	pCi/L	Chromium-51	3.27E+02	2.98E+02	1.10	Acceptable
1st / 2011	01/11/11	E7467-278	Milk	pCi/L	Cesium-134	1.19E+02	1.30E+02	0.91	Acceptable
1st / 2011	01/11/11	E7467-278	Milk	pCi/L	Cesium-137	2.20E+02	2.05E+02	1.07	Acceptable
1st / 2011	01/11/11	E7467-278	Milk	pCi/L	Cobalt-58	1.18E+02	1.13E+02	1.04	Acceptable
1st / 2011	01/11/11	E7467-278	Milk	pCi/L	Manganese-54	2.78E+02	2.66E+02	1.04	Acceptable
1st / 2011	01/11/11	E7467-278	Milk	pCi/L	Iron-59	1.94E+02	1.75E+02	1.11	Acceptable
1st / 2011	01/11/11	E7467-278	Milk	pCi/L	Zinc-65	2.88E+02	2.61E+02	1.10	Acceptable
1st / 2011	01/11/11	E7467-278	Milk	pCi/L	Cobalt-60	1.76E+02	1.72E+02	1.03	Acceptable
1st / 2011	01/11/11	E7468-278	Water	pCi/L	Iodine-131	9.73E+01	9.40E+01	1.04	Acceptable
1st / 2011	01/11/11	E7468-278	Water	pCi/L	Chromium-51	2.16E+02	1.96E+02	1.10	Acceptable
1st / 2011	01/11/11	E7468-278	Water	pCi/L	Cesium-134	8.52E+01	8.56E+01	0.99	Acceptable
1st / 2011	01/11/11	E7468-278	Water	pCi/L	Cesium-137	1.47E+02	1.35E+02	1.09	Acceptable
1st / 2011	01/11/11	E7468-278	Water	pCi/L	Cobalt-58	7.71E+01	7.44E+01	1.04	Acceptable
1st / 2011	01/11/11	E7468-278	Water	pCi/L	Manganese-54	1.88E+02	1.75E+02	1.08	Acceptable
1st / 2011	01/11/11	E7468-278	Water	pCi/L	Iron-59	1.26E+02	1.15E+02	1.10	Acceptable
1st / 2011	01/11/11	E7468-278	Water	pCi/L	Zinc-65	1.90E+02	1.72E+02	1.11	Acceptable
1st / 2011	01/11/11	E7468-278	Water	pCi/L	Cobalt-60	1.14E+02	1.13E+02	1.01	Acceptable
2nd / 2011	07/25/11	E7859-278	Cartridge	pCi	Iodine-131	8.17E+01	8.65E+01	0.95	Acceptable
2nd / 2011	07/25/11	E7860-278	Milk	pCi/L	Strontium-89	9.68E+01	1.03E+02	0.94	Acceptable
2nd / 2011	07/25/11	E7860-278	Milk	pCi/L	Strontium-90	1.58E+01	1.56E+01	1.01	Acceptable
2nd / 2011	07/25/11	E7861-278	Milk	pCi/L	Iodine-131	9.00E+01	1.03E+02	0.87	Acceptable
2nd / 2011	07/25/11	E7861-278	Milk	pCi/L	Cerium-141	8.36E+01	7.99E+01	1.05	Acceptable
2nd / 2011	07/25/11	E7861-278	Milk	pCi/L	Chromium-51	2.39E+02	2.06E+02	1.16	Acceptable
2nd / 2011	07/25/11	E7861-278	Milk	pCi/L	Cesium-134	1.71E+02	1.90E+02	0.90	Acceptable
2nd / 2011	07/25/11	E7861-278	Milk	pCi/L	Cesium-137	1.43E+02	1.38E+02	1.04	Acceptable
2nd / 2011	07/25/11	E7861-278	Milk	pCi/L	Cobalt-58	1.50E+02	1.52E+02	0.99	Acceptable
2nd / 2011	07/25/11	E7861-278	Milk	pCi/L	Manganese-54	1.32E+02	1.38E+02	0.96	Acceptable
2nd / 2011	07/25/11	E7861-278	Milk	pCi/L	Iron-59	1.43E+02	1.23E+02	1.16	Acceptable
2nd / 2011	07/25/11	E7861-278	Milk	pCi/L	Zinc-65	2.76E+02	2.61E+02	1.06	Acceptable
2nd / 2011	07/25/11	E7861-278	Milk	pCi/L	Cobalt-60	1.92E+02	1.95E+02	0.99	Acceptable
2nd / 2011	07/25/11	E7862-278	Water	pCi/L	Zinc-65	3.47E+02	3.05E+02	1.14	Acceptable
2nd / 2011	07/25/11	E7862-278	Water	pCi/L	Cobalt-60	2.38E+02	2.28E+02	1.05	Acceptable
2nd / 2011	07/25/11	E7862-278	Water	pCi/L	Iodine-131	1.20E+02	1.01E+02	1.19	Acceptable
2nd / 2011	07/25/11	E7862-278	Water	pCi/L	Cerium-141	9.30E+01	9.35E+01	0.99	Acceptable
2nd / 2011	07/25/11	E7862-278	Water	pCi/L	Chromium-51	3.36E+02	2.41E+02	1.39	Not Acceptable
2nd / 2011	07/25/11	E7862-278	Water	pCi/L	Cesium-134	2.02E+02	2.22E+02	0.91	Acceptable
2nd / 2011	07/25/11	E7862-278	Water	pCi/L	Cesium-137	1.73E+02	1.61E+02	1.07	Acceptable
2nd / 2011	07/25/11	E7862-278	Water	pCi/L	Manganese-54	1.66E+02	1.61E+02	1.03	Acceptable

Quarter / Year	Analysis Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
2nd / 2011	07/25/11	E7862-278	Water	pCi/L	Iron-59	1.57E+02	1.44E+02	1.09	Acceptable
3rd / 2011	10/19/11	E8095-278	Cartridge	pCi	Iodine-131	7.69E+01	8.02E+01	0.96	Acceptable
3rd / 2011	10/19/11	E8096-278	Milk	pCi/L	Strontium-89	9.51E+01	9.08E+01	1.05	Acceptable
3rd / 2011	10/19/11	E8096-278	Milk	pCi/L	Strontium-90	8.49E+00	1.47E+01	0.58	Not Acceptable
3rd / 2011	10/19/11	E8097-278	Milk	pCi/L	Iodine-131	8.59E+01	8.92E+01	0.96	Acceptable
3rd / 2011	10/19/11	E8097-278	Milk	pCi/L	Cerium-141	6.59E+01	6.67E+01	0.99	Acceptable
3rd / 2011	10/19/11	E8097-278	Milk	pCi/L	Chromium-51	2.18E+02	2.26E+02	0.96	Acceptable
3rd / 2011	10/19/11	E8097-278	Milk	pCi/L	Cesium-134	1.20E+02	1.28E+02	0.94	Acceptable
3rd / 2011	10/19/11	E8097-278	Milk	pCi/L	Cesium-137	1.23E+02	1.14E+02	1.08	Acceptable
3rd / 2011	10/19/11	E8097-278	Milk	pCi/L	Cobalt-58	9.08E+01	9.75E+01	0.93	Acceptable
3rd / 2011	10/19/11	E8097-278	Milk	pCi/L	Manganese-54	1.57E+02	1.51E+02	1.04	Acceptable
3rd / 2011	10/19/11	E8097-278	Milk	pCi/L	Iron-59	5.30E+01	5.48E+01	0.97	Acceptable
3rd / 2011	10/19/11	E8097-278	Milk	pCi/L	Zinc-65	1.88E+02	1.80E+02	1.04	Acceptable
3rd / 2011	10/19/11	E8097-278	Milk	pCi/L	Cobalt-60	1.51E+02	1.57E+02	0.96	Acceptable
3rd / 2011	10/19/11	E8098-278	Water	pCi/L	Iodine-131	7.23E+01	8.01E+01	0.9	Acceptable
3rd / 2011	10/19/11	E8098-278	Water	pCi/L	Cerium-141	9.06E+01	9.15E+01	0.99	Acceptable
3rd / 2011	10/19/11	E8098-278	Water	pCi/L	Chromium-51	3.19E+02	3.10E+02	1.03	Acceptable
3rd / 2011	10/19/11	E8098-278	Water	pCi/L	Cesium-134	1.57E+02	1.76E+02	0.89	Acceptable
3rd / 2011	10/19/11	E8098-278	Water	pCi/L	Cesium-137	1.60E+02	1.56E+02	1.03	Acceptable
3rd / 2011	10/19/11	E8098-278	Water	pCi/L	Cobalt-58	1.34E+02	1.34E+02	1.00	Acceptable
3rd / 2011	10/19/11	E8098-278	Water	pCi/L	Manganese-54	2.19E+02	2.07E+02	1.06	Acceptable
3rd / 2011	10/19/11	E8098-278	Water	pCi/L	Iron-59	9.04E+01	7.52E+01	1.20	Acceptable
3rd / 2011	10/19/11	E8098-278	Water	pCi/L	Zinc-65	2.74E+02	2.47E+02	1.11	Acceptable
3rd / 2011	10/19/11	E8098-278	Water	pCi/L	Cobalt-60	2.25E+02	2.15E+02	1.04	Acceptable
4th / 2011	01/12/12	E8197-278	Cartridge	pCi	Iodine-131	9.52E+01	9.82E+01	1.07	Acceptable
4th / 2011	01/12/12	E8198-278	Milk	pCi/L	Strontium-89	8.78E+01	8.96E+01	0.98	Acceptable
4th / 2011	01/12/12	E8198-278	Milk	pCi/L	Strontium-90	1.51E+01	1.48E+01	1.02	Acceptable
4th / 2011	01/12/12	E8199-278	Milk	pCi/L	Iodine-131	9.36E+01	9.02E+01	1.04	Acceptable
4th / 2011	01/12/12	E8199-278	Milk	pCi/L	Chromium-51	5.53E+02	5.66E+02	0.98	Acceptable
4th / 2011	01/12/12	E8199-278	Milk	pCi/L	Cesium-134	1.59E+02	1.71E+02	0.93	Acceptable
4th / 2011	01/12/12	E8199-278	Milk	pCi/L	Cesium-137	2.27E+02	2.10E+02	1.08	Acceptable
4th / 2011	01/12/12	E8199-278	Milk	pCi/L	Cobalt-58	2.18E+02	2.21E+02	0.99	Acceptable
4th / 2011	01/12/12	E8199-278	Milk	pCi/L	Manganese-54	2.52E+02	2.41E+02	1.05	Acceptable
4th / 2011	01/12/12	E8199-278	Milk	pCi/L	Iron-59	1.90E+02	1.83E+02	1.04	Acceptable
4th / 2011	01/12/12	E8199-278	Milk	pCi/L	Zinc-65	3.19E+02	2.91E+02	1.09	Acceptable
4th / 2011	01/12/12	E8199-278	Milk	pCi/L	Cobalt-60	2.82E+02	2.70E+02	1.04	Acceptable
4th / 2011	01/12/12	E8200-278	Water	pCi/L	Iodine-131	8.44E+01	8.87E+01	0.95	Acceptable
4th / 2011	01/12/12	E8200-278	Water	pCi/L	Chromium-51	5.32E+02	5.66E+02	0.94	Acceptable
4th / 2011	01/12/12	E8200-278	Water	pCi/L	Cesium-134	1.56E+02	1.71E+02	0.91	Acceptable
4th / 2011	01/12/12	E8200-278	Water	pCi/L	Cesium-137	2.06E+02	2.10E+02	0.98	Acceptable
4th / 2011	01/12/12	E8200-278	Water	pCi/L	Cobalt-58	2.02E+02	2.21E+02	0.92	Acceptable
4th / 2011	01/12/12	E8200-278	Water	pCi/L	Manganese-54	2.50E+02	2.41E+02	1.04	Acceptable
4th / 2011	01/12/12	E8200-278	Water	pCi/L	Iron-59	1.81E+02	1.83E+02	0.99	Acceptable
4th / 2011	01/12/12	E8200-278	Water	pCi/L	Zinc-65	2.95E+02	2.91E+02	1.01	Acceptable
4th / 2011	01/12/12	E8200-278	Water	pCi/L	Cobalt-60	2.58E+02	2.70E+02	0.96	Acceptable

TABLE 3

2011 DEPARTMENT OF ENERGY MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP) RESULTS

Quarter / Year	Analysis Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
1st / 2011	11/10/10	MAPEP-10-GrF23	Filter	Bq/sample	Gross Beta	0.525	0.5	0.25 - 0.75	Acceptable
1st / 2011	11/10/10	MAPEP-10-GrF23	Filter	Bq/sample	Gross Beta	106	109	82.2 - 140	Acceptable
1st / 2011	11/10/10	MAPEP-10-GrW23	Water	Bq/L	Gross Alpha	1.67	1.92	0.58 - 3.26	Acceptable
1st / 2011	11/10/10	MAPEP-10-GrW23	Water	Bq/L	Gross Beta	4.407	4.39	2.20 - 6.59	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaS23	Soil	Bq/kg	Americium-241	63.27	87	61- 113	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaS23	Soil	Bq/kg	Cesium-134	924	940	658 - 1222	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaS23	Soil	Bq/kg	Cesium-137	685	670	469 - 871	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaS23	Soil	Bq/kg	Cobalt-60	360	343	240 - 246	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaS23	Soil	Bq/kg	Iron-55	1120	1333	933 - 1733	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaS23	Soil	Bq/kg	Manganese-54	875.3	820	574 - 1066	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaS23	Soil	Bq/kg	Nickel-63	901.3	1058	741 - 1375	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaS23	Soil	Bq/kg	Plutonium-238	12.4	64	45 - 83	Not Acceptable
1st / 2011	11/10/10	MAPEP-10-MaS23	Soil	Bq/kg	Plutonium-239/240	21.87	71	50 - 92	Not Acceptable
1st / 2011	11/10/10	MAPEP-10-MaS23	Soil	Bq/kg	Potassium-40	774	699	489-909	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaS23	Soil	Bq/kg	Technetium-99	272.3	325	228 - 423	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaS23	Soil	Bq/kg	Uranium-234/233	266.33	278	195 - 361	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaS23	Soil	Bq/kg	Uranium-238	171	143	83.6 - 210	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaS23	Soil	Bq/kg	Zinc-65	301	265	186 - 345	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaW23	Water	Bq/L	Cesium-134	31.4	31.4	22.0 - 40.8	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaW23	Water	Bq/L	Cesium-137	45.5	44.2	30.9 - 57.5	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaW23	Water	Bq/L	Cobalt-57	36.53	36.0	25.2 - 46.8	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaW23	Water	Bq/L	Cobalt-60	29.10	28.3	19.8 - 36.38	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaW23	Water	Bq/L	Hydrogen-3	429.30	453.4	317.4 - 589.4	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaW23	Water	Bq/L	Iron-55	61.43	60.2	42.1 - 78.3	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaW23	Water	Bq/L	Nickel-63	50	56.10	39.3 - 72.9	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaW23	Water	Bq/L	Plutonium-238	0.866	1.81	1.27 - 2.35	Not Acceptable
1st / 2011	11/10/10	MAPEP-10-MaW23	Water	Bq/L	Plutonium-239/240	1.22	1.35	0.95 - 1.76	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaW23	Water	Bq/L	Potassium-40	42.3	38.9	27.2 - 50.6	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaW23	Water	Bq/L	Strontium-90	7.03	8.3	5.8 - 10.8	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaW23	Water	Bq/L	Technetium-99	33.3	33.6	23.5 - 43.7	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaW23	Water	Bq/L	Uranium-234/233	1.937	2.01	1.41 - 2.61	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaW23	Water	Bq/L	Uranium-238	2.043	2.07	1.45 - 2.69	Acceptable
1st / 2011	11/10/10	MAPEP-10-MaW23	Water	Bq/L	Zinc-65	34.77	31.0	21.7 - 40.3	Acceptable
1st / 2011	11/10/10	MAPEP-10-RaF23	Filter	ug/sample	Uranium-235	0.0764	0.074	0.052 - 0.096	Acceptable
1st / 2011	11/10/10	MAPEP-10-RaF23	Filter	ug/sample	Uranium-238	10.5	10.2	7.1 - 13.3	Acceptable
1st / 2011	11/10/10	MAPEP-10-RaF23	Filter	ug/sample	Uranium-Total	10.9	10.3	7.2 - 13.4	Acceptable
1st / 2011	11/10/10	MAPEP-10-RaF23	Filter	Bq/sample	Americium-241	0.0917	0.115	0.081 - 0.150	Acceptable
1st / 2011	11/10/10	MAPEP-10-RaF23	Filter	Bq/sample	Cesium-134	2.95	2.98	2.09 - 3.87	Acceptable
1st / 2011	11/10/10	MAPEP-10-RaF23	Filter	Bq/sample	Cobalt-57	4.06	4.08	2.86 - 5.30	Acceptable
1st / 2011	11/10/10	MAPEP-10-RaF23	Filter	Bq/sample	Cobalt-60	2.97	2.92	2.04 - 3.80	Acceptable

Quarter / Year	Analysis Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
1st / 2011	11/10/10	MAPEP-10-RaF23	Filter	Bq/sample	Manganese-54	3.347	3.18	2.23 - 4.13	Acceptable
1st / 2011	11/10/10	MAPEP-10-RaF23	Filter	Bq/sample	Plutonium-238	0.049	0.0489	0.0342 - 0.0336	Acceptable
1st / 2011	11/10/10	MAPEP-10-RaF23	Filter	Bq/sample	Plutonium-239/240	0.076	0.082	0.057 - 0.107	Acceptable
1st / 2011	11/10/10	MAPEP-10-RaF23	Filter	Bq/sample	Strontium-90	0.854	1.01	0.71 - 1.31	Acceptable
1st / 2011	11/10/10	MAPEP-10-RaF23	Filter	Bq/sample	Uranium-234/233	0.124	0.122	0.085 - 0.159	Acceptable
1st / 2011	11/10/10	MAPEP-10-RaF23	Filter	Bq/sample	Uranium-238	0.122	0.127	0.089 - 0.165	Acceptable
1st / 2011	11/10/10	MAPEP-10-RdV23	Vegetation	Bq/sample	Americium-241	0.210	0.270	0.189 - 0.351	Acceptable
1st / 2011	11/10/10	MAPEP-10-RdV23	Vegetation	Bq/sample	Cesium-134	4.485	4.79	3.35 - 6.23	Acceptable
1st / 2011	11/10/10	MAPEP-10-RdV23	Vegetation	Bq/sample	Cesium-137	4.759	5.88	4.12 - 7.64	Acceptable
1st / 2011	11/10/10	MAPEP-10-RdV23	Vegetation	Bq/sample	Cobalt-57	9.389	8.27	5.79 - 10.75	Acceptable
1st / 2011	11/10/10	MAPEP-10-RdV23	Vegetation	Bq/sample	Manganese-54	7.34	6.287	4.401 - 8.173	Acceptable
1st / 2011	11/10/10	MAPEP-10-RdV23	Vegetation	Bq/sample	Plutonium-238	0.258	0.221	0.155 - 0.287	Acceptable
1st / 2011	11/10/10	MAPEP-10-RdV23	Vegetation	Bq/sample	Strontium-90	2.790	2.63	1.84 - 3.42	Acceptable
1st / 2011	11/10/10	MAPEP-10-RdV23	Vegetation	Bq/sample	Uranium-234/233	0.392	0.320	0.224 - 0.416	Acceptable
1st / 2011	11/10/10	MAPEP-10-RdV23	Vegetation	Bq/sample	Uranium-238	0.405	0.330	0.231 - 0.429	Acceptable
1st / 2011	11/10/10	MAPEP-10-RdV23	Vegetation	Bq/sample	Zinc-65	6.630	5.39	3.77 - 7.01	Acceptable
2nd / 2011	04/05/11	GENE01-11-MaWR3	Water	Bq/L	Plutonium-238	1.1	1.16	0.81 - 1.51	Acceptable
2nd / 2011	04/05/11	GENE01-11-MaWR3	Water	Bq/L	Plutonium-239/240	0.8	0.85	0.60 - 1.11	Acceptable
2nd / 2011	04/05/11	GENE01-11-RdFR1	Water	Bq/sample	Plutonium-238	0.00737	0.00836	.00585-.01087	Acceptable
2nd / 2011	04/05/11	GENE01-11-RdFR1	Water	Bq/sample	Plutonium-239/240	0.00481	0.00670	.00469-.00871	Acceptable
3rd / 2011	05/07/11	MAPEP-11-GrF24	Filter	Bq/sample	Gross Alpha	0.102	0.659	0.198 - 1.120	Not Acceptable
3rd / 2011	05/07/11	MAPEP-11-GrF24	Filter	Bq/sample	Gross Beta	1.210	1.32	0.662 - 1.985	Acceptable
3rd / 2011	05/07/11	MAPEP-11-GrW24	Water	Bq/L	Gross Alpha	1.019	1.136	0.341 - 1.931	Acceptable
3rd / 2011	05/07/11	MAPEP-11-GrW24	Water	Bq/L	Gross Beta	3.140	2.96	1.48 - 4.44	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaS24	Soil	mg/kg	Americium-241	64.93	61.1	42.8 - 79.4	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaS24	Soil	mg/kg	Cesium-134	686.5	680	476 - 884	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaS24	Soil	mg/kg	Cesium-137	783	758	531 - 985	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaS24	Soil	mg/kg	Cobalt-57	898.5	927	649 - 1205	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaS24	Soil	mg/kg	Cobalt-60	493.5	482	337 - 627	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaS24	Soil	mg/kg	Iron-55	245	387	271 - 503	Not Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaS24	Soil	mg/kg	Nickel-63	440.3	582	407 - 757	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaS24	Soil	mg/kg	Plutonium-239/240	90.87	98.0	68.6 - 127.4	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaS24	Soil	mg/kg	Potassium-40	588	540	378 - 702	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaS24	Soil	mg/kg	Strontium-90	112.8	160	112 - 208	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaS24	Soil	mg/kg	Uranium-234/233	175.33	176	123 - 229	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaS24	Soil	mg/kg	Uranium-238	195.67	184	129 - 239	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaS24	Soil	mg/kg	Zinc-65	1515	1359	951 - 1767	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaW24	Water	Bq/L	Americium-241	0.4877	0.529	0.370 - 0.688	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaW24	Water	Bq/L	Cesium-134	19.60	21.5	15.1 - 28.0	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaW24	Water	Bq/L	Cesium-137	29.9	29.4	20.6 - 38.2	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaW24	Water	Bq/L	Cobalt-60	24.75	24.6	17.2 - 32.0	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaW24	Water	Bq/L	Hydrogen-3	225.3	243	170 - 316	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaW24	Water	Bq/L	Iron-55	14.10	26.4	18.5 - 34.3	Not Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaW24	Water	Bq/L	Manganese-54	32.9	31.6	22.1 - 41.1	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaW24	Water	Bq/L	Nickel-63	19.2	18.6	13.0 - 24.2	Acceptable

Quarter / Year	Analysis Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
3rd / 2011	05/07/11	MAPEP-11-MaW24	Water	Bq/L	Plutonium-238	1.005	1.064	0.745 - 1.383	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaW24	Water	Bq/L	Plutonium-239/240	0.755	0.809	0.566 - 1.052	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaW24	Water	Bq/L	Potassium-40	99.8	91	64 - 118	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaW24	Water	Bq/L	Strontium-90	8.05	8.72	6.10 - 11.34	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaW24	Water	Bq/L	Technetium-99	8.6	8.99	6.29 - 11.69	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaW24	Water	Bq/L	Uranium-234/233	1.537	1.50	1.05 - 1.95	Acceptable
3rd / 2011	05/07/11	MAPEP-11-MaW24	Water	Bq/L	Uranium-238	1.457	1.54	1.08 - 2.00	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdF24	Filter	ug/sample	Uranium-235	0.108	0.106	0.074 - 0.138	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdF24	Filter	ug/sample	Uranium-238	14.4	14.9	10.4 - 19.4	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdF24	Filter	ug/sample	Uranium-Total	14.4	15.0	10.5 - 19.5	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdF24	Filter	Bq/sample	Cesium-134	3.39	3.49	2.44 - 4.54	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdF24	Filter	Bq/sample	Cesium-137	2.375	2.28	1.60 - 2.96	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdF24	Filter	Bq/sample	Cobalt-57	3.60	3.33	2.33 - 4.33	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdF24	Filter	Bq/sample	Manganese-54	2.975	2.64	1.85 - 3.43	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdF24	Filter	Bq/sample	Plutonium-238	0.092	0.096	0.067 - 0.125	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdF24	Filter	Bq/sample	Plutonium-239/240	0.073	0.0765	0.0536 - 0.0995	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdF24	Filter	Bq/sample	Strontium-90	1.373	1.36	0.95 - 1.77	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdF24	Filter	Bq/sample	Uranium-234/233	0.184	0.178	0.125 - 0.231	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdF24	Filter	Bq/sample	Uranium-238	0.183	0.185	0.130 - 0.241	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdF24	Filter	Bq/sample	Zinc-65	3.470	3.18	2.23 - 4.13	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdV24	Vegetation	Bq/sample	Cesium-134	5.120	5.50	3.85 - 7.15	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdV24	Vegetation	Bq/sample	Cobalt-57	9.835	9.94	6.96 - 12.92	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdV24	Vegetation	Bq/sample	Cobalt-60	5.060	4.91	3.44 - 6.38	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdV24	Vegetation	Bq/sample	Manganese-54	6.405	6.40	4.48 - 8.32	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdV24	Vegetation	Bq/sample	Plutonium-238	0.110	0.102	0.071 - 0.133	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdV24	Vegetation	Bq/sample	Plutonium-239/240	0.1277	0.141	0.099 - 0.183	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdV24	Vegetation	Bq/sample	Strontium-90	2.430	2.46	1.72 - 3.20	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdV24	Vegetation	Bq/sample	Uranium-234/233	0.158	0.163	0.114 - 0.212	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdV24	Vegetation	Bq/sample	Uranium-238	0.159	0.168	0.118 - 0.218	Acceptable
3rd / 2011	05/07/11	MAPEP-11-RdV24	Vegetation	Bq/sample	Zinc-65	3.275	2.99	2.09 - 3.89	Acceptable
4th / 2011	11/21/11	MAPEP-11-GrF25	Filter	Bq/sample	Gross Alpha	0.0037	-	False Positive	Not Acceptable
4th / 2011	11/21/11	MAPEP-11-GrF25	Filter	Bq/sample	Gross Beta	0.027	-	False Positive	Not Acceptable
4th / 2011	11/21/11	MAPEP-11-GrW25	Water	Bq/L	Gross Alpha	0.876	0.866	0.260 - 1.472	Acceptable
4th / 2011	11/21/11	MAPEP-11-GrW25	Water	Bq/L	Gross Beta	5.003	4.81	2.41 - 7.22	Acceptable
4th / 2011	11/21/11	MAPEP-11-MaS25	Soil	Bq/kg	Cesium-137	990.5	979	685 - 1273	Acceptable
4th / 2011	11/21/11	MAPEP-11-MaS25	Soil	Bq/kg	Cobalt-57	1140	1180	826 - 1534	Acceptable
4th / 2011	11/21/11	MAPEP-11-MaS25	Soil	Bq/kg	Cobalt-60	665.5	644	451 - 837	Acceptable
4th / 2011	11/21/11	MAPEP-11-MaS25	Soil	Bq/kg	Iron-55	1206.7	1000	700 - 1300	Acceptable
4th / 2011	11/21/11	MAPEP-11-MaS25	Soil	Bq/kg	Manganese-54	897.5	848	594 - 1102	Acceptable
4th / 2011	11/21/11	MAPEP-11-MaS25	Soil	Bq/kg	Plutonium-238	90.9	93.6	65.5 - 121.7	Acceptable
4th / 2011	11/21/11	MAPEP-11-MaS25	Soil	Bq/kg	Plutonium-239/240	76.6	77.4	54.2 - 100.6	Acceptable
4th / 2011	11/21/11	MAPEP-11-MaS25	Soil	Bq/kg	Potassium-40	692	625	438 - 813	Acceptable
4th / 2011	11/21/11	MAPEP-11-MaS25	Soil	Bq/kg	Strontium-90	333.3	320	224 - 416	Acceptable
4th / 2011	11/21/11	MAPEP-11-MaS25	Soil	Bq/kg	Technetium-99	166	182	127 - 237	Acceptable
4th / 2011	11/21/11	MAPEP-11-MaS25	Soil	Bq/kg	Uranium-234/233	273.67	263	184 - 342	Acceptable

Quarter / Year	Analysis Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
4th / 2011	11/21/11	MAPEP-11-MaS25	Soil	Bq/kg	Uranium-238	287.33	274	192 - 356	Acceptable
4th / 2011	11/21/11	MAPEP-11-MaS25	Soil	Bq/kg	Zinc-65	1770	1560	1092 - 2028	Acceptable
4th / 2011	11/16/11	MAPEP-11-MaW25	Water	Bq/L	Americium-241	3.0667	3.18	2.23 - 4.13	Acceptable
4th / 2011	11/16/11	MAPEP-11-MaW25	Water	Bq/L	Cesium-134	16.95	19.1	13.4 - 24.8	Acceptable
4th / 2011	11/16/11	MAPEP-11-MaW25	Water	Bq/L	Cobalt-57	38.05	36.6	25.6 - 47.6	Acceptable
4th / 2011	11/16/11	MAPEP-11-MaW25	Water	Bq/L	Cobalt-60	30.45	29.3	20.5 - 38.1	Acceptable
4th / 2011	11/16/11	MAPEP-11-MaW25	Water	Bq/L	Hydrogen-3	965.7	1014	710 - 1318	Acceptable
4th / 2011	11/16/11	MAPEP-11-MaW25	Water	Bq/L	Manganese-54	26.95	25.0	17.5 - 32.5	Acceptable
4th / 2011	11/16/11	MAPEP-11-MaW25	Water	Bq/L	Plutonium-239/240	2.247	2.4	1.68 - 3.12	Acceptable
4th / 2011	11/16/11	MAPEP-11-MaW25	Water	Bq/L	Potassium-40	171.5	156	109 - 203	Acceptable
4th / 2011	11/16/11	MAPEP-11-MaW25	Water	Bq/L	Strontium-90	14.47	14.2	9.9 - 18.5	Acceptable
4th / 2011	11/16/11	MAPEP-11-MaW25	Water	Bq/L	Uranium-234/233	2.673	2.78	1.95 - 3.61	Acceptable
4th / 2011	11/21/11	MAPEP-11-MaW25	Water	Bq/L	Uranium-238	2.787	2.89	2.02 - 3.76	Acceptable
4th / 2011	11/21/11	MAPEP-11-MaW25	Water	Bq/L	Zinc-65	32.7	28.5	20.0 - 37.1	Acceptable
4th / 2011	11/21/11	MAPEP-11-RdF25	Filter	uq/sample	Uranium-235	0.0927	0.0966	0.0676 - 0.1256	Acceptable
4th / 2011	11/21/11	MAPEP-11-RdF25	Filter	uq/sample	Uranium-238	12.9	13.7	9.6 - 17.8	Acceptable
4th / 2011	11/21/11	MAPEP-11-RdF25	Filter	uq/sample	Uranium-Total	13	13.8	9.7 - 17.9	Acceptable
4th / 2011	11/21/11	MAPEP-11-RdF25	Filter	Bq/sample	Americium-241	0.1097	0.147	0.103 - 0.191	Acceptable
4th / 2011	11/21/11	MAPEP-11-RdF25	Filter	Bq/sample	Cesium-137	1.945	2.6	1.82 - 3.38	Acceptable
4th / 2011	11/21/11	MAPEP-11-RdF25	Filter	Bq/sample	Cobalt-57	4.23	5.09	3.56 - 6.62	Acceptable
4th / 2011	11/21/11	MAPEP-11-RdF25	Filter	Bq/sample	Cobalt-60	2.525	3.2	2.24 - 4.16	Acceptable
4th / 2011	11/21/11	MAPEP-11-RdF25	Filter	Bq/sample	Plutonium-238	0.096	0.1183	0.0828 - 0.1538	Acceptable
4th / 2011	11/21/11	MAPEP-11-RdF25	Filter	Bq/sample	Plutonium-239/240	0.094	0.135	0.095 - 0.176	Not Acceptable
4th / 2011	11/21/11	MAPEP-11-RdF25	Filter	Bq/sample	Strontium-90	1.213	1.67	1.17 - 2.17	Acceptable
4th / 2011	11/21/11	MAPEP-11-RdF25	Filter	Bq/sample	Uranium-234/233	0.116	0.162	0.113 - 0.211	Acceptable
4th / 2011	11/21/11	MAPEP-11-RdF25	Filter	Bq/sample	Uranium-238	0.105	0.168	0.118 - 0.218	Not Acceptable
4th / 2011	11/21/11	MAPEP-11-RdF25	Filter	Bq/sample	Zinc-65	3.355	4.11	2.88 - 5.34	Acceptable
4th / 2011	11/16/11	MAPEP-11-RdV25	Vegetation	Bq/sample	Americium-241	0.205	0.222	0.155 - 0.289	Acceptable
4th / 2011	11/16/11	MAPEP-11-RdV25	Vegetation	Bq/sample	Cesium-137	4.72	4.71	3.30 - 6.12	Acceptable
4th / 2011	11/16/11	MAPEP-11-RdV25	Vegetation	Bq/sample	Cobalt-60	3.48	3.38	2.37 - 4.39	Acceptable
4th / 2011	11/16/11	MAPEP-11-RdV25	Vegetation	Bq/sample	Manganese-54	5.925	5.71	4.00 - 7.42	Acceptable
4th / 2011	11/16/11	MAPEP-11-RdV25	Vegetation	Bq/sample	Plutonium-238	0.111	0.124	0.087 - 0.161	Acceptable
4th / 2011	11/16/11	MAPEP-11-RdV25	Vegetation	Bq/sample	Strontium-90	1.38	1.26	0.88 - 1.64	Acceptable
4th / 2011	11/16/11	MAPEP-11-RdV25	Vegetation	Bq/sample	Uranium-234/233	0.352	0.357	0.250 - 0.464	Acceptable
4th / 2011	11/16/11	MAPEP-11-RdV25	Vegetation	Bq/sample	Uranium-238	0.337	0.37	0.259 - 0.481	Acceptable
4th / 2011	11/16/11	MAPEP-11-RdV25	Vegetation	Bq/sample	Zinc-65	6.63	6.39	4.47 - 8.31	Acceptable
4th / 2011	11/16/11	MAPEP-11-XaW25	Water	Bq/sample	Iodine-129	8.723	9.5	6.7 - 12.4	Acceptable

TABLE 4

2011 ERA PROGRAM PERFORMANCE EVALUATION RESULTS

Quarter / Year	Analytical Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
1st / 2011	02/18/11	RAD - 84	Water	pCi/L	Barium-133	58.4	52.3	43.1 - 57.9	Not Acceptable
1st / 2011	02/18/11	RAD - 84	Water	pCi/L	Cesium-134	53.0	56.2	45.4 - 61.8	Acceptable
1st / 2011	02/18/11	RAD - 84	Water	pCi/L	Cesium-137	103	100	90.0 - 112	Acceptable
1st / 2011	02/18/11	RAD - 84	Water	pCi/L	Cobalt-60	73.2	68.9	62.0 - 78.2	Acceptable
1st / 2011	02/18/11	RAD - 84	Water	pCi/L	Zinc-65	166	153	138 - 180	Acceptable
1st / 2011	02/18/11	RAD - 84	Water	pCi/L	Gross Alpha	65.1	62.5	32.7 - 77.5	Acceptable
1st / 2011	02/18/11	RAD - 84	Water	pCi/L	Gross Beta	54.4	51.9	35.3 - 58.9	Acceptable
1st / 2011	02/18/11	RAD - 84	Water	pCi/L	Gross Alpha	51.2	62.5	32.7 - 77.5	Acceptable
1st / 2011	02/18/11	RAD - 84	Water	pCi/L	Radium-226	8.06	8.26	6.21 - 9.71	Acceptable
1st / 2011	02/18/11	RAD - 84	Water	pCi/L	Radium-228	7.4	7.35	4.64 - 9.40	Acceptable
1st / 2011	02/18/11	RAD - 84	Water	pCi/L	Uranium (Nat)	46.1	45.6	37.0 - 50.7	Acceptable
1st / 2011	02/18/11	RAD - 84	Water	ug/L	Uranium (Nat) mass	69.6	66.5	53.9 - 74.0	Acceptable
1st / 2011	02/18/11	RAD - 84	Water	pCi/L	Radium-226	9.68	8.26	6.21 - 9.71	Acceptable
1st / 2011	02/18/11	RAD - 84	Water	pCi/L	Radium-228	6.41	7.35	4.64 - 9.40	Acceptable
1st / 2011	02/18/11	RAD - 84	Water	pCi/L	Uranium (Nat)	45.3	45.6	37.0 - 50.7	Acceptable
1st / 2011	02/18/11	RAD - 84	Water	ug/L	Uranium (Nat) mass	67.6	66.5	53.9 - 74.0	Acceptable
1st / 2011	02/18/11	RAD - 84	Water	pCi/L	Tritium	2930	3460	2930 - 3820	Acceptable
1st / 2011	02/18/11	RAD - 84	Water	pCi/L	Strontium-89	48.9	55.3	44.1 - 62.9	Acceptable
1st / 2011	02/18/11	RAD - 84	Water	pCi/L	Strontium-90	27	33.1	24.2 - 38.3	Acceptable
1st / 2011	02/18/11	RAD - 84	Water	pCi/L	Strontium-89	55.3	55.3	44.1 - 62.9	Acceptable
1st / 2011	02/18/11	RAD - 84	Water	pCi/L	Strontium-90	29.3	33.1	24.2 - 38.3	Acceptable
1st / 2011	02/18/11	RAD - 84	Water	pCi/L	Iodine-131	29	26.8	22.3 - 31.5	Acceptable
1st / 2011	02/18/11	RAD - 84	Water	pCi/L	Iodine-131	23.9	26.8	22.3 - 31.5	Acceptable
2nd / 2011	05/03/11	040511P	Water	pCi/L	Strontium-89	57.9	68.1	55.4 - 76.2	Acceptable
2nd / 2011	05/03/11	040511P	Water	pCi/L	Strontium-90	32.4	29.9	21.8 - 34.7	Acceptable
2nd / 2011	06/14/11	052011J	Water	pCi/L	Barium-133	76.6	75.3	63.0 - 82.8	Acceptable
2nd / 2011	06/14/11	052011J	Water	pCi/L	Cesium-134	71.3	72.9	59.5 - 80.2	Acceptable
2nd / 2011	06/14/11	052011J	Water	pCi/L	Cesium-137	78.8	77.0	69.3 - 87.4	Acceptable
2nd / 2011	06/14/11	052011J	Water	pCi/L	Cobalt-60	92.7	88.8	79.9 - 100	Acceptable
2nd / 2011	06/14/11	052011J	Water	pCi/L	Zinc-65	118	98.9	89.0 - 118	Acceptable
3rd / 2011	08/11/11	071111J	Filter	pCi/Filter	Gross Alpha	13.2	8.80	4.56 - 13.2	Acceptable
3rd / 2011	08/11/11	071111J	Filter	pCi/Filter	Gross Beta	84.7	92.2	56.8 - 92.2	Acceptable
3rd / 2011	08/11/11	071111J	Soil	pCi/kg	Americium-241	2130	1660	992 - 2130	Acceptable
3rd / 2011	08/11/11	071111J	Soil	pCi/kg	Actinium-228	1300	1330	860 - 1880	Acceptable
3rd / 2011	08/11/11	071111J	Soil	pCi/kg	Bismuth-212	1460	1550	406 - 2310	Acceptable
3rd / 2011	08/11/11	071111J	Soil	pCi/kg	Bismuth-214	1430	1420	872 - 2050	Acceptable
3rd / 2011	08/11/11	071111J	Soil	pCi/kg	Cesium-134	6000	5170	3330 - 6220	Acceptable
3rd / 2011	08/11/11	071111J	Soil	pCi/kg	Cesium-137	6190	4970	3800 - 6460	Acceptable
3rd / 2011	08/11/11	071111J	Soil	pCi/kg	Cobalt-60	9680	7520	5470 - 10100	Acceptable
3rd / 2011	08/11/11	071111J	Soil	pCi/kg	Lead-212	1300	1260	820 - 1780	Acceptable
3rd / 2011	08/11/11	071111J	Soil	pCi/kg	Lead-214	1700	1510	902 - 2260	Acceptable
3rd / 2011	08/11/11	071111J	Soil	pCi/kg	Manganese-54	<263	0.00	---	Acceptable

Quarter / Year	Analytical Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
3rd / 2011	08/11/11	071111J	Soil	pCi/kg	Potassium-40	10200	11200	8060 - 15100	Acceptable
3rd / 2011	08/11/11	071111J	Soil	pCi/kg	Thorium-234	1460	1590	500 - 3020	Acceptable
3rd / 2011	08/11/11	071111J	Soil	pCi/kg	Zinc-65	2910	1940	1540 - 2600	Not Acceptable
3rd / 2011	08/11/11	071111J	Soil	pCi/kg	Strontium-90	8390	5750	2080 - 9380	Acceptable
3rd / 2011	08/11/11	071111J	Water	pCi/L	Iron-55	426	588	342 - 785	Acceptable
3rd / 2011	08/18/11	RAD-86	Water	pCi/L	Gross Alpha	44.2	71.5	37.6 - 88.2	Acceptable
3rd / 2011	08/18/11	RAD-86	Water	pCi/L	Gross Beta	58.4	63.4	43.8 - 70.0	Acceptable
3rd / 2011	08/18/11	RAD-86	Water	pCi/L	Gross Alpha	53.1	71.5	37.6 - 88.2	Acceptable
3rd / 2011	08/18/11	RAD-86	Water	pCi/L	Tritium	7200	7620	6600 - 8370	Acceptable
3rd / 2011	08/18/11	RAD-86	Water	pCi/L	Strontium-89	51.9	52.3	41.4 - 59.8	Acceptable
3rd / 2011	08/18/11	RAD-86	Water	pCi/L	Strontium-90	20.3	26.4	19.1 - 30.8	Acceptable
3rd / 2011	08/18/11	RAD-86	Water	pCi/L	Iodine-131	35.4	26.0	21.6 - 30.7	Not Acceptable
3rd / 2011	09/02/11	RAD-800	Water	pCi/L	Barium-133	55.3	51.6	42.5 - 57.2	Acceptable
3rd / 2011	09/02/11	RAD-800	Water	pCi/L	Cesium-134	77.9	84.1	68.9 - 92.5	Acceptable
3rd / 2011	09/02/11	RAD-800	Water	pCi/L	Cesium-137	111	109	98.1 - 122	Acceptable
3rd / 2011	09/02/11	RAD-800	Water	pCi/L	Cobalt-60	110	109	98.1 - 122	Acceptable
3rd / 2011	09/02/11	RAD-800	Water	pCi/L	Zinc-65	63.4	52.8	46.3 - 64.8	Acceptable
3rd / 2011	09/02/11	RAD-800	Water	pCi/L	Radium-226	14.3	14.6	10.9 - 16.8	Acceptable
3rd / 2011	09/02/11	RAD-800	Water	pCi/L	Radium-228	12.6	13.2	8.75 - 16.1	Acceptable
3rd / 2011	09/02/11	RAD-800	Water	pCi/L	Uranium (Nat)	50.7	51.2	41.6 - 56.9	Acceptable
3rd / 2011	09/02/11	RAD-800	Water	ug/L	Uranium (Nat) mass	71.7	74.7	60.6 - 83.0	Acceptable
3rd / 2011	09/02/11	RAD-800	Water	pCi/L	Radium-226	14.1	14.6	10.9 - 16.8	Acceptable
3rd / 2011	09/02/11	RAD-800	Water	pCi/L	Radium-228	12.5	13.2	8.75 - 16.1	Acceptable
3rd / 2011	09/02/11	RAD-800	Water	pCi/L	Uranium (Nat)	52.2	51.2	41.6 - 56.9	Acceptable
3rd / 2011	09/02/11	RAD-800	Water	ug/L	Uranium (Nat) mass	77.9	74.7	60.6 - 83.0	Acceptable
4th / 2011	10/25/11	RAD-87	Liquid	pCi/L	Iodine-131	28.5	27.5	22.9 - 32.3	Acceptable
4th / 2011	10/25/11	RAD-87	Liquid	pCi/L	Iodine-131	28.7	27.5	22.9 - 32.3	Acceptable

TABLE 5

2011 ERA PROGRAM (MRAD) PERFORMANCE EVALUATION RESULTS

Quarter / Year	Analytical Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
2nd / 2011	05/11/11	MRAD-14	Soil	pCi/kg	Actinium-228	1290	1490	958 - 2100	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	pCi/kg	Bismuth-212	1340	1400	368 - 2090	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	pCi/kg	Bismuth-214	749	725	445 - 1040	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	pCi/kg	Cesium-134	3240	2450	1580 - 2950	Not Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	pCi/kg	Cesium-137	2440	1920	1470 - 2490	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	pCi/kg	Cobalt-60	2850	2220	1620 - 2980	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	pCi/kg	Lead-212	1160	1440	931 - 2030	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	pCi/kg	Lead-214	848	805	482 - 1200	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	pCi/kg	Manganese-54	<33.9	0.00	---	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	pCi/kg	Potassium-40	11400	11500	8320 - 15600	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	pCi/kg	Thorium-234	696	962	305 - 1830	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	pCi/kg	Zinc-65	2670	1990	1580 - 2670	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	pCi/kg	Strontium-90	6570	7590	2740 - 12400	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	pCi/kg	Uranium-234	941	972	616 - 1210	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	pCi/kg	Uranium-238	776	962	588 - 1220	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	pCi/kg	Uranium-Total	1754	1980	1130 - 2670	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	ug/kg	Uranium-Total(mass)	2314	2890	1590 - 3640	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	pCi/kg	Americium-241	1260	914	546 - 1170	Not Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	pCi/kg	Plutonium-238	1500	1420	813 - 2000	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	pCi/kg	Plutonium-239	1540	1400	956 - 1860	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	pCi/kg	Uranium-234	671	972	616 - 1210	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	pCi/kg	Uranium-238	783	962	588 - 1220	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	pCi/kg	Uranium-Total	1498	1980	1130 - 2670	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	ug/kg	Uranium-Total(mass)	2350	2890	1590 - 3640	Acceptable
2nd / 2011	05/11/11	MRAD-14	Soil	ug/kg	Uranium-Total(mass)	1950	2890	1590 - 3640	Acceptable
2nd / 2011	05/11/11	MRAD-14	Vegetation	pCi/kg	Americium-241	3430	3200	1820 - 4400	Acceptable
2nd / 2011	05/11/11	MRAD-14	Vegetation	pCi/kg	Curium-244	829	812	400 - 1260	Acceptable
2nd / 2011	05/11/11	MRAD-14	Vegetation	pCi/kg	Plutonium-238	2910	2990	1610 - 4380	Acceptable
2nd / 2011	05/11/11	MRAD-14	Vegetation	pCi/kg	Plutonium-239	3000	3100	1920 - 4230	Acceptable
2nd / 2011	05/11/11	MRAD-14	Vegetation	pCi/kg	Uranium-234	2400	2610	1790 - 3460	Acceptable
2nd / 2011	05/11/11	MRAD-14	Vegetation	pCi/kg	Uranium-238	2510	2590	1820 - 3270	Acceptable
2nd / 2011	05/11/11	MRAD-14	Vegetation	pCi/kg	Uranium-Total	5032	5320	3660 - 6860	Acceptable
2nd / 2011	05/11/11	MRAD-14	Vegetation	ug/kg	Uranium-Total(mass)	7530	7760	5340 - 10000	Acceptable
2nd / 2011	05/11/11	MRAD-14	Vegetation	pCi/kg	Americium-241	3760	3200	1820 - 4400	Acceptable
2nd / 2011	05/11/11	MRAD-14	Vegetation	pCi/kg	Cesium-134	829	770	441 - 1070	Acceptable
2nd / 2011	05/11/11	MRAD-14	Vegetation	pCi/kg	Cesium-137	883	829	608 - 1150	Acceptable
2nd / 2011	05/11/11	MRAD-14	Vegetation	pCi/kg	Cobalt-60	795	733	496 - 1050	Acceptable
2nd / 2011	05/11/11	MRAD-14	Vegetation	pCi/kg	Manganese-54	<34.1	0.00	---	Acceptable
2nd / 2011	05/11/11	MRAD-14	Vegetation	pCi/kg	Potassium-40	28300	25800	18500-36500	Acceptable
2nd / 2011	05/11/11	MRAD-14	Vegetation	pCi/kg	Zinc-65	1020	799	577 - 1090	Acceptable
2nd / 2011	05/11/11	MRAD-14	Vegetation	pCi/kg	Plutonium-238	2910	2990	1610 - 4380	Acceptable

Quarter / Year	Analytical Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
2nd / 2011	05/11/11	MRAD-14	Vegetation	pCi/kg	Plutonium-239	3000	3100	1920 - 4230	Acceptable
2nd / 2011	05/11/11	MRAD-14	Vegetation	pCi/kg	Strontium-90	7400	7890	4410 - 10500	Acceptable
2nd / 2011	05/11/11	MRAD-14	Filter	pCi/Filter	Americium-241	69.2	62.5	36.6 - 85.7	Acceptable
2nd / 2011	05/11/11	MRAD-14	Filter	pCi/Filter	Plutonium-238	69.3	69.0	47.4 - 90.7	Acceptable
2nd / 2011	05/11/11	MRAD-14	Filter	pCi/Filter	Plutonium-239	65.4	65.5	47.5 - 84.8	Acceptable
2nd / 2011	05/11/11	MRAD-14	Filter	pCi/Filter	Uranium-234	60.3	61.5	38.7 - 91.1	Acceptable
2nd / 2011	05/11/11	MRAD-14	Filter	pCi/Filter	Uranium-238	66.7	61.0	39.0 - 86.6	Acceptable
2nd / 2011	05/11/11	MRAD-14	Filter	pCi/Filter	Uranium-Total	131.1	125	63.9 - 199	Acceptable
2nd / 2011	05/11/11	MRAD-14	Filter	ug/Filter	Uranium-Total(mass)	200	183	114 - 263	Acceptable
2nd / 2011	05/11/11	MRAD-14	Filter	pCi/Filter	Americium-241	74.9	62.5	36.6 - 85.7	Acceptable
2nd / 2011	05/11/11	MRAD-14	Filter	pCi/Filter	Cesium-134	260	279	182 - 345	Acceptable
2nd / 2011	05/11/11	MRAD-14	Filter	pCi/Filter	Cesium-137	320	312	234 - 410	Acceptable
2nd / 2011	05/11/11	MRAD-14	Filter	pCi/Filter	Cobalt-60	426	390	302 - 487	Acceptable
2nd / 2011	05/11/11	MRAD-14	Filter	pCi/Filter	Manganese-54	<4.6	0.00	---	Acceptable
2nd / 2011	05/11/11	MRAD-14	Filter	pCi/Filter	Zinc-65	318	279	193 - 386	Acceptable
2nd / 2011	05/11/11	MRAD-14	Filter	pCi/Filter	Strontium-90	192	185	81.4 - 288	Acceptable
2nd / 2011	05/11/11	MRAD-14	Filter	pCi/Filter	Iron-55	391	385	169 - 599	Acceptable
2nd / 2011	05/11/11	MRAD-14	Filter	ug/Filter	Uranium-Total(mass)	185	183	114 - 263	Acceptable
2nd / 2011	05/11/11	MRAD-14	Filter	pCi/Filter	Uranium-234	54.8	61.5	38.7 - 91.1	Acceptable
2nd / 2011	05/11/11	MRAD-14	Filter	pCi/Filter	Uranium-238	54.4	61.0	39.0 - 86.6	Acceptable
2nd / 2011	05/11/11	MRAD-14	Filter	pCi/Filter	Uranium-Total	109	125	63.9 - 199	Acceptable
2nd / 2011	05/11/11	MRAD-14	Filter	ug/Filter	Uranium-Total(mass)	177	183	114 - 263	Acceptable
2nd / 2011	05/11/11	MRAD-14	Filter	pCi/Filter	Gross Alpha	<5.00	74.3	38.5 - 112	Not Acceptable
2nd / 2011	05/11/11	MRAD-14	Filter	pCi/Filter	Gross Beta	34.1	69.5	42.8 - 102	Not Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Uranium-234	87.1	94.3	71.1 - 122	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Uranium-238	81.0	93.5	71.4 - 116	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Uranium-Total	168.1	192	138 - 256	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	ug/L	Uranium-Total(mass)	241	280	219 - 346	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Americium-241	137	135	92.5 - 182	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Plutonium-238	116	131	99.1 - 162	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Plutonium-239	101	119	92.1 - 147	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Uranium-234	88.5	94.3	71.1 - 122	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Uranium-238	88.1	93.5	71.4 - 116	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Uranium-Total	180.7	192	138 - 256	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	ug/L	Uranium-Total(mass)	264	280	219 - 346	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Americium-241	140	135	92.5 - 182	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Cesium-134	222	231	171 - 265	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Cesium-137	430	417	354 - 500	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Cobalt-60	430	411	358 - 486	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Manganese-54	<5.17	0.00	---	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Zinc-65	131	111	94.1 - 138	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Strontium-90	782	773	491 - 1030	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Uranium-234	100	94.3	71.1 - 122	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Uranium-238	88.7	93.5	71.4 - 116	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Uranium-Total	188.7	192	138 - 256	Acceptable

Quarter / Year	Analytical Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
2nd / 2011	05/11/11	MRAD-14	Water	ug/L	Uranium-Total(mass)	264	280	219 - 346	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Iron-55	245	437	254 - 584	Not Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Gross Alpha	99.7	112	49.7 - 166	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Gross Beta	103	99.8	58.4 - 146	Acceptable
2nd / 2011	05/11/11	MRAD-14	Water	pCi/L	Tritium	13300	15200	9900 - 22500	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Uranium-234	2502	2530	1600 - 3140	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Uranium-238	2347	2560	1560 - 3250	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Uranium-Total	4849	5190	2960 - 7010	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	ug/kg	Uranium-Total (mass)	6980	7570	4160 - 9520	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Americium-241	1360	1210	723 - 1550	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Plutonium-238	1290	1240	710 - 1750	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Plutonium-239	1570	1440	983 - 1910	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Uranium-234	2520	2530	1600 - 3104	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Uranium-238	2670	2560	1560 - 3250	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Uranium-Total	5304	5190	2960 - 7010	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	ug/kg	Uranium-Total (mass)	8000	7570	4160 - 9520	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Actinium-228	1250	1350	866 - 1900	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Bismuth-212	1500	1400	368 - 2090	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Bismuth-214	1860	1420	872 - 2040	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Cesium-134	4750	4120	2650 - 4960	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Cesium-137	5940	4660	3560 - 6050	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Cobalt-60	6230	5350	3890 - 7180	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Lead-212	1520	1310	845 - 1840	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Lead-214	2090	1380	826 - 2050	Not Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Manganese-54	< 46.2	< 1000	0.00 - 1000	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Potassium-40	10200	12500	9060 - 16900	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Thorium-234	2960	2560	813 - 4880	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Zinc-65	4590	3760	2980 - 5040	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Strontium-90	6210	5780	2090 - 9430	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Uranium-234	2640	2530	1600 - 3140	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Uranium-238	2450	2560	1560 - 3250	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Uranium-Total	5200	5190	2960 - 7010	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	ug/kg	Uranium-Total (mass)	7286	7570	4160 - 9520	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	ug/kg	Uranium-Total (mass)	7430	7570	4160 - 9520	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Americium-241	3040	2980	1700 - 4090	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Curium-244	697	642	316 - 1000	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Plutonium-238	3000	2880	1560 - 4220	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Plutonium-239	2910	2980	1850 - 4060	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Uranium-234	2580	2420	1660 - 3210	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Uranium-238	2660	2400	1690 - 3030	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Uranium-Total	5356	4920	3330 - 6120	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	ug/kg	Uranium-Total (mass)	7970	7180	4810 - 9120	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Cesium-134	1480	1380	790 - 1910	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Cesium-137	1570	1270	932 - 1760	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Cobalt-60	1800	1500	1010 - 2160	Acceptable

Quarter / Year	Analytical Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Manganese-54	< 44.0	< 300	0.00 - 300	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Potassium-40	32100	28800	20700-40800	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Zinc-65	3470	2770	2000 - 3790	Acceptable
4th / 2011	10/31/11	MRAD-15	Soil	pCi/kg	Strontium-90	6320	5440	3040 - 7220	Acceptable
4th / 2011	10/31/11	MRAD-15	Filter	pCi/Filter	Americium-241	63.4	76.0	44.5 - 104	Acceptable
4th / 2011	10/31/11	MRAD-15	Filter	pCi/Filter	Plutonium-238	62.5	71.2	48.9 - 93.6	Acceptable
4th / 2011	10/31/11	MRAD-15	Filter	pCi/Filter	Plutonium-239	65.5	69.0	50.0 - 89.4	Acceptable
4th / 2011	10/31/11	MRAD-15	Filter	pCi/Filter	Uranium-234	66.8	74.2	46.7 - 110	Acceptable
4th / 2011	10/31/11	MRAD-15	Filter	pCi/Filter	Uranium-238	68.8	73.5	47.0 - 104	Acceptable
4th / 2011	10/31/11	MRAD-15	Filter	pCi/Filter	Uranium-Total	139	151	77.2 - 240	Acceptable
4th / 2011	10/31/11	MRAD-15	Filter	ug/Filter	Uranium-Total (mass)	206	220	137 - 316	Acceptable
4th / 2011	10/31/11	MRAD-15	Filter	pCi/Filter	Cesium-134	376	429	279 - 531	Acceptable
4th / 2011	10/31/11	MRAD-15	Filter	pCi/Filter	Cesium-137	465	486	365 - 638	Acceptable
4th / 2011	10/31/11	MRAD-15	Filter	pCi/Filter	Cobalt-60	496	524	405 - 655	Acceptable
4th / 2011	10/31/11	MRAD-15	Filter	pCi/Filter	Manganese-54	< 5.31	< 50.0	0.00 - 50.0	Acceptable
4th / 2011	10/31/11	MRAD-15	Filter	pCi/Filter	Zinc-65	471	464	321 - 643	Acceptable
4th / 2011	10/31/11	MRAD-15	Filter	pCi/Filter	Strontium-90	106	112	49.3 - 174	Acceptable
4th / 2011	10/31/11	MRAD-15	Filter	pCi/Filter	Uranium-Total (mass)	184	220	137 - 316	Acceptable
4th / 2011	10/31/11	MRAD-15	Filter	pCi/Filter	Gross Alpha	81.2	58.4	30.3 - 87.8	Acceptable
4th / 2011	10/31/11	MRAD-15	Filter	pCi/Filter	Gross Beta	56.0	48.9	30.1 - 71.4	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	pCi/L	Uranium-234	80.9	94.4	71.2 - 122	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	pCi/L	Uranium-238	88.3	93.6	71.5 - 116	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	pCi/L	Uranium-Total	169	192	138 - 256	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	ug/L	Uranium-Total (mass)	263	281	220 - 347	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	pCi/L	Americium-241	135	135	92.5 - 182	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	pCi/L	Plutonium-238	122	130	98.3 - 161	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	pCi/L	Plutonium-239	112	121	93.6 - 150	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	pCi/L	Uranium-234	85.4	94.4	71.2 - 122	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	pCi/L	Uranium-238	90.5	93.6	71.5 - 116	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	pCi/L	Uranium-Total	182	192	138 - 256	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	ug/L	Uranium-Total (mass)	272	281	220 - 347	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	pCi/L	Cesium-134	293	323	239 - 371	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	pCi/L	Cesium-137	423	421	358 - 504	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	pCi/L	Cobalt-60	505	486	423 - 574	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	pCi/L	Manganese-54	< 6.58	< 100	0.00 - 100	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	pCi/L	Zinc-65	349	315	267 - 393	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	pCi/L	Strontium-90	846	795	505 - 1060	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	pCi/L	Uranium-234	99.5	94.4	71.2 - 122	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	pCi/L	Uranium-238	94.4	93.6	71.5 - 116	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	pCi/L	Uranium-Total	194	192	138 - 256	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	ug/L	Uranium-Total (mass)	281	281	220 - 347	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	pCi/L	Iron-55	667	564	328 - 753	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	pCi/L	Gross Alpha	48.2	68.9	30.6 - 102	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	pCi/L	Gross Beta	45.5	51.7	30.2 - 75.8	Acceptable
4th / 2011	10/31/11	MRAD-15	Water	pCi/L	Tritium	19900	21300	13900-31500	Acceptable

FIGURE 1

COBALT-60 PERFORMANCE EVALUATION RESULTS AND % BIAS

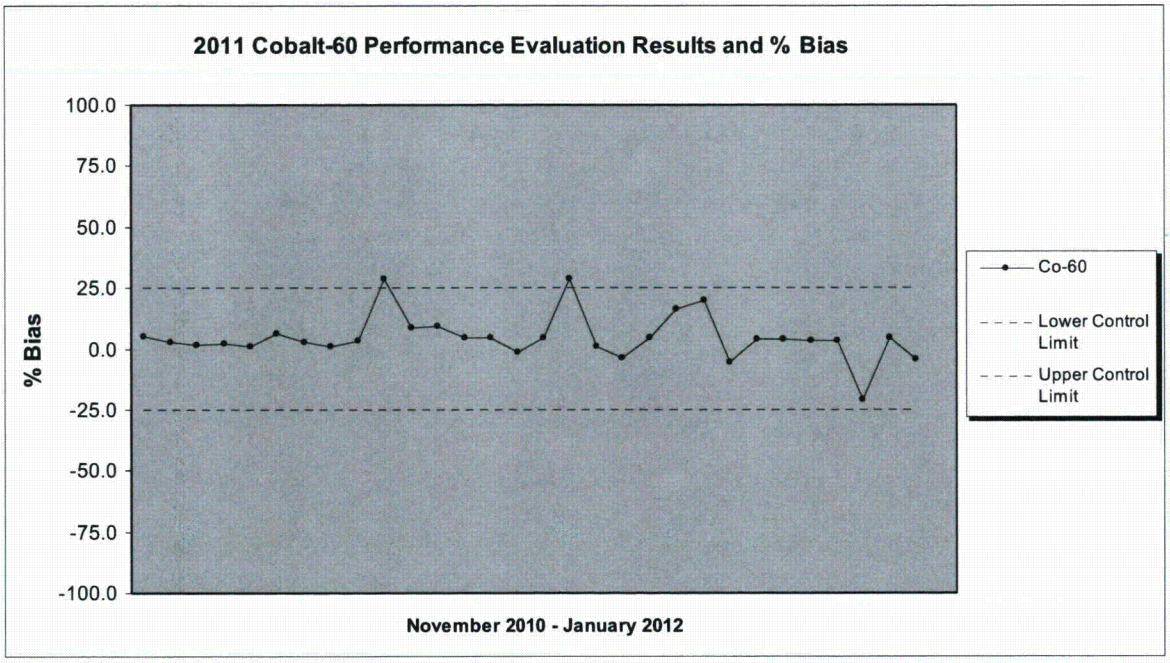


FIGURE 2

CESIUM-137 PERFORMANCE EVALUATION RESULTS AND % BIAS

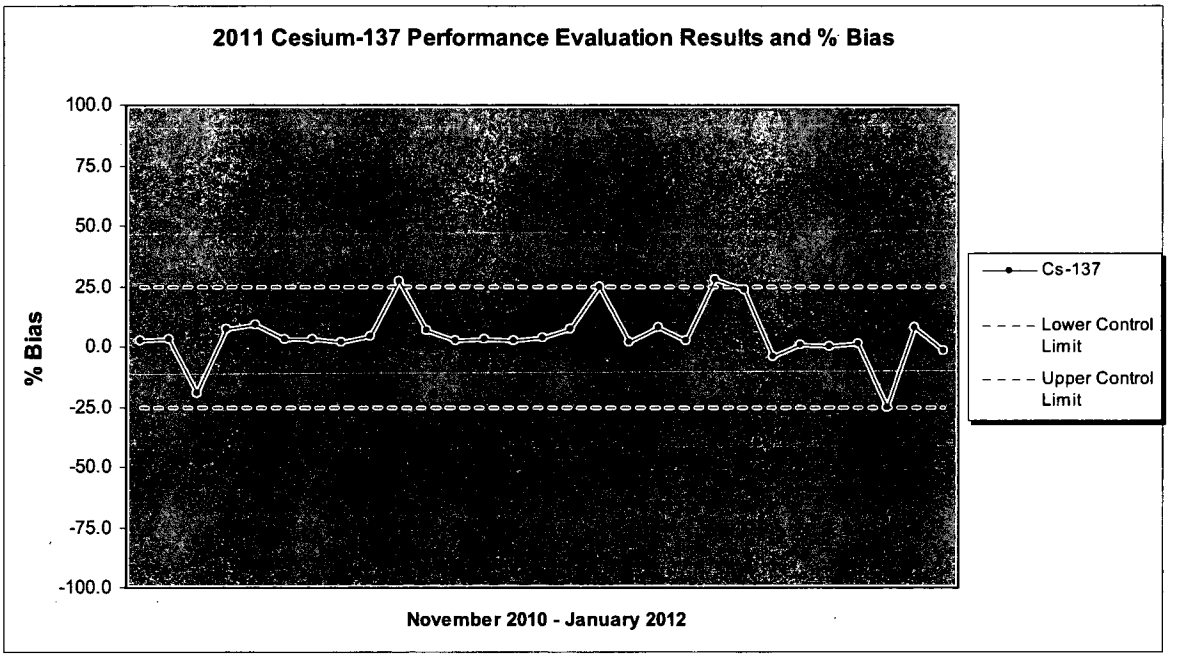


FIGURE 3

TRITIUM PERFORMANCE EVALUATION RESULTS AND % BIAS

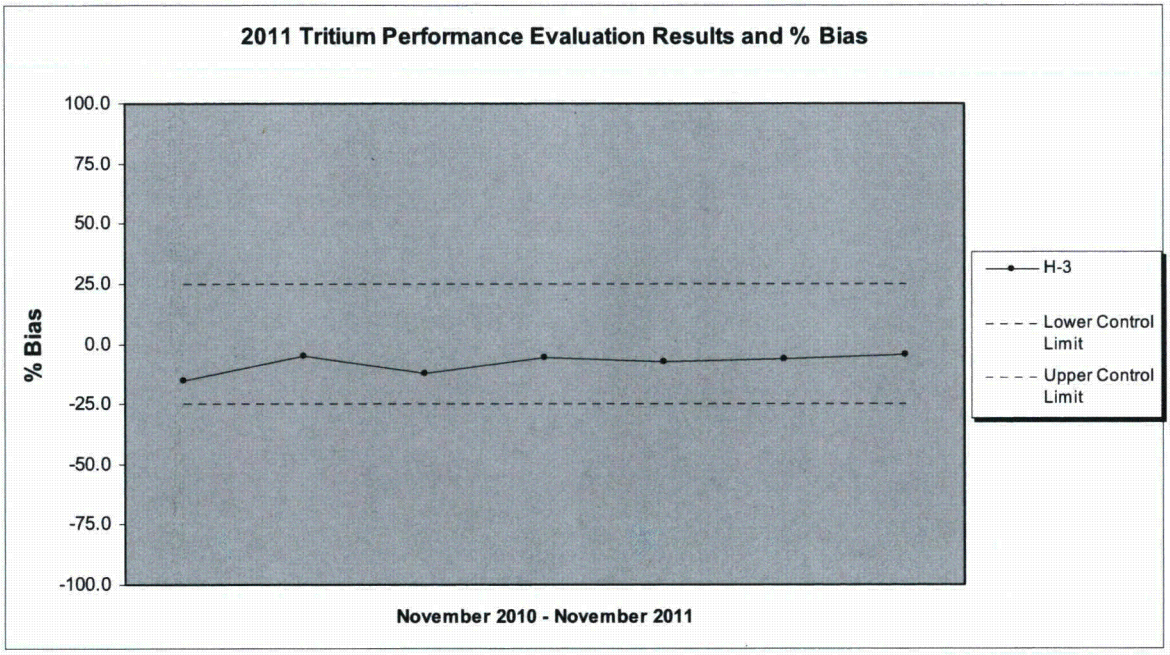


FIGURE 4

STRONTIUM-90 PERFORMANCE EVALUATION RESULTS AND % BIAS

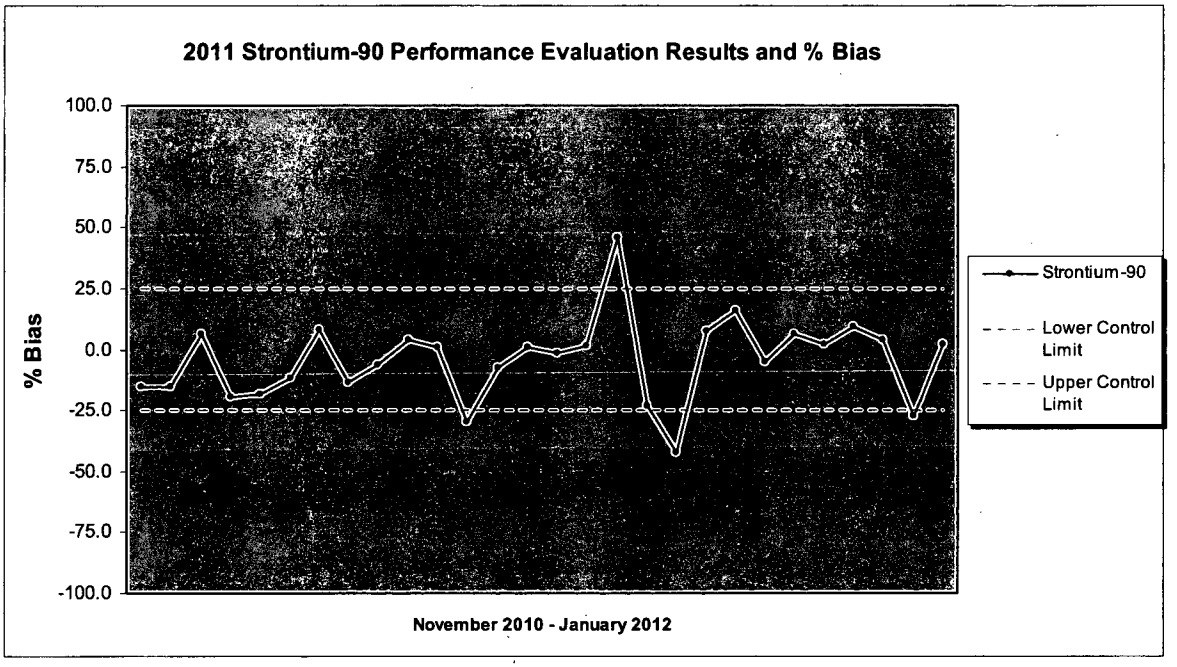


FIGURE 5

GROSS ALPHA PERFORMANCE EVALUATION RESULTS AND % BIAS