Enclosure
PG&E Letter DCL-11-050

2010 ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

2010 Annual Radiological Environmental Operating Report Diablo Canyon Power Plant

January 1, 2010 - December 31, 2010

2010 Diablo Canyon Power Plant

ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT
(AREOR)
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EXECUTIVE SUMMARY

During the year 2010, 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 1100 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, 2010 through December 31, 2010. This program is 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 are as follows:

Air Particulate (AP)	Air Cartridges (AC) For Iodine 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)	

Diablo Canyon REMP collects environmental samples and ships them to General Engineering Labs (GEL) located in Charleston, South Carolina. All REMP lab sample analyses in 2010 were performed by GEL.

The ambient direct radiation levels in the DCPP environs did not change and were within the preoperational range.

Site operations had no significant impact on airborne radioactivity in the environment.

Site operations had no significant impact on surface water radioactivity.

Site operations had no significant impact on drinking water radioactivity.

Food crops, milk, and meat samples detected only naturally occurring radioactivity; and therefore had no impact from site operation.

Site operations had no significant impact on marine life radioactivity.

Site operations had no significant impact on aquatic or terrestrial vegetation radioactivity.

Ground water monitoring data is 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 is 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 indicate that any groundwater (subsurface) flow beneath the DCPP power block is not currently used as a source of drinking water. Due to topography and site characteristics, this subsurface flow discharges into the Pacific Ocean which is approximately 100 yards from the power block.

In March 2008, the DCPP Unit Two (U-2) Steam Generators were replaced and the old U-2 Steam Generators (4 total) were stored onsite within the Old Steam Generator Storage Facility (OSGSF) mausoleum. In February 2009, the DCPP Unit One (U-1) Steam Generators were replaced and the old U-1 Steam Generators (4 total) were stored onsite within the OSGSF mausoleum. In November 2009, the DCPP Unit Two (U-2) Reactor (Rx) Head was replaced and the old U-2 Rx Head was stored onsite within the OSGSF mausoleum. In October 2010, the DCPP Unit One (U-1) Rx Head was replaced and the old U-1 Rx Head was stored onsite within the OSGSF mausoleum. As of 12-31-10, the OSGSF contains eight old Steam Generators and two old Rx Heads. This OSGSF mausoleum did not cause any changes to the ambient direct radiation levels in the DCPP environs during 2010.

The OSGSF building sumps were inspected quarterly by the REMP. Rainwater was found in the U-2 Old Steam Generator vault # 30 sump. This rainwater had tritium concentrations of < 1,000 pCi/Liter. The rainwater from the sump was removed and processed via an approved radwaste discharge pathway.

Beginning in June 2009, DCPP began loading of the Independent Spent Fuel Storage Installation (ISFSI) and is discussed in Section 4. The ISFSI had no significant impact to the inner ring REMP TLD station readings.

The results of the 2010 REMP showed no unusual findings from site operations. These results were also compared to preoperational data and showed no unusual trends.

The operation of DCPP had no significant radiological impact on the environment.

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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 are 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 are collected by contract divers of Tenera Environmental and given to DCPP REMP personnel for shipment to GEL. Market fish samples are 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 the DCPP Thermoluminescent Dosimeter (TLD) Lab.

DCPP sends 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 are direct radiation and air sampling.

This report summarizes the quarterly findings of the Radiological Environmental Monitoring Program (REMP) conducted by the 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 are exceeded) 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 will 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 (including 2 sigma total propagated error) 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 is 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 relative direction from the plant and distance. Analysis of survey data from the two zones aids in determining if there is a significant difference between the two areas. It can also help in differentiating 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. 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. 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.

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 are 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 and 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 location) to determine the activity concentration of gamma emitting isotopes.

The TEDA impregnated charcoal cartridges were counted for each weekly sampling period at each location 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 are 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, location, date, time of collection, and the person performing the collection and sent to GEL for analysis.

2.3.4 Marine Biological, Beach Sand, and Ocean Sediment

The REMP requires 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 are 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 are sent to GEL in-shell where GEL personnel remove the meat & internal organs for analysis. Only edible portions of the fish were analyzed (fish fillets). The samples were labeled with sample type, location, date, time of collection, and individual performing the 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 requires 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 is no broadleaf food vegetation available that satisfies this requirement. Because these food products are unavailable, the DCPP REMP conducts 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 a quarterly household garden (6C1).

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

2.3.6 Milk

There are no animals within the vicinity of the plant that are utilized for milk consumption by humans. However, supplemental samples of cow milk were collected monthly from Cal Poly Farm (5F2) which is 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, location, collection date, collection time, and the individual performing the collection. The samples were then express shipped to GEL for analysis.

2.3.7 Meat

A rancher routinely grazes 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.

Property owners could hunt deer and wild pig (in season) within 5 miles of the site boundary. The REMP attempted to obtain meat samples from these property owners when available. Gamma spec and strontium analyses were performed on the meat (when provided). No deer or pig meat were provided in 2010.

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, location, collection date, collection time, and the individual performing 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 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)			
BGM	Blanchard Farm (Goat Meat)			
BSM	Blanchard Farm (Sheep Meat)			
JDM	Johe Property (Deer Meat)			

*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	5	- East-northeast
1	- North-northwest	6	- East
2	- North	7	- East-southeast
3	- North-northeast	8	- Southeast
4	- Northeast	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)
- 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.

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* 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:

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

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.

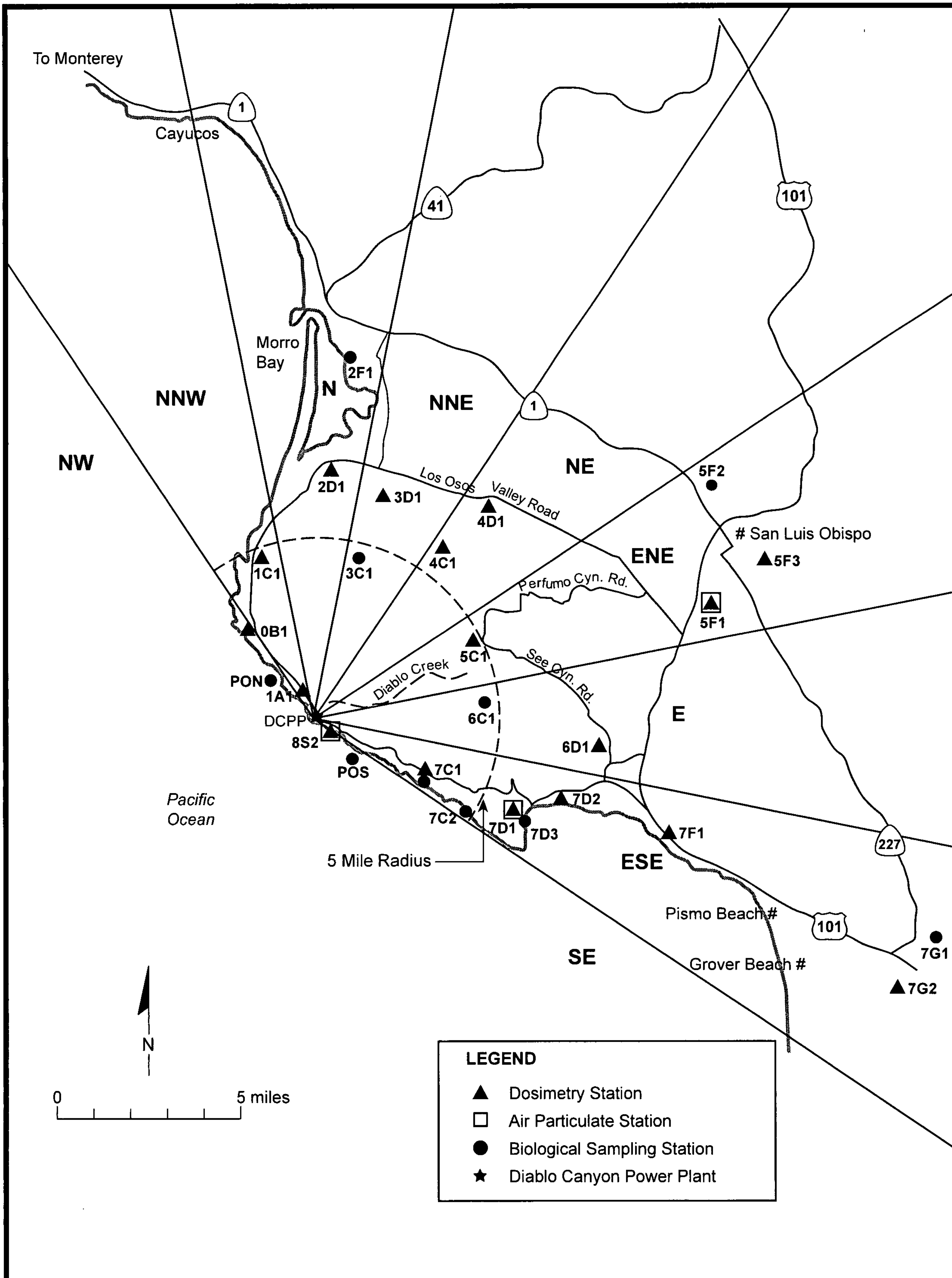
TABLE 2.4: Reporting Levels for Radioactivity Concentrations in Environmental Samples

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.

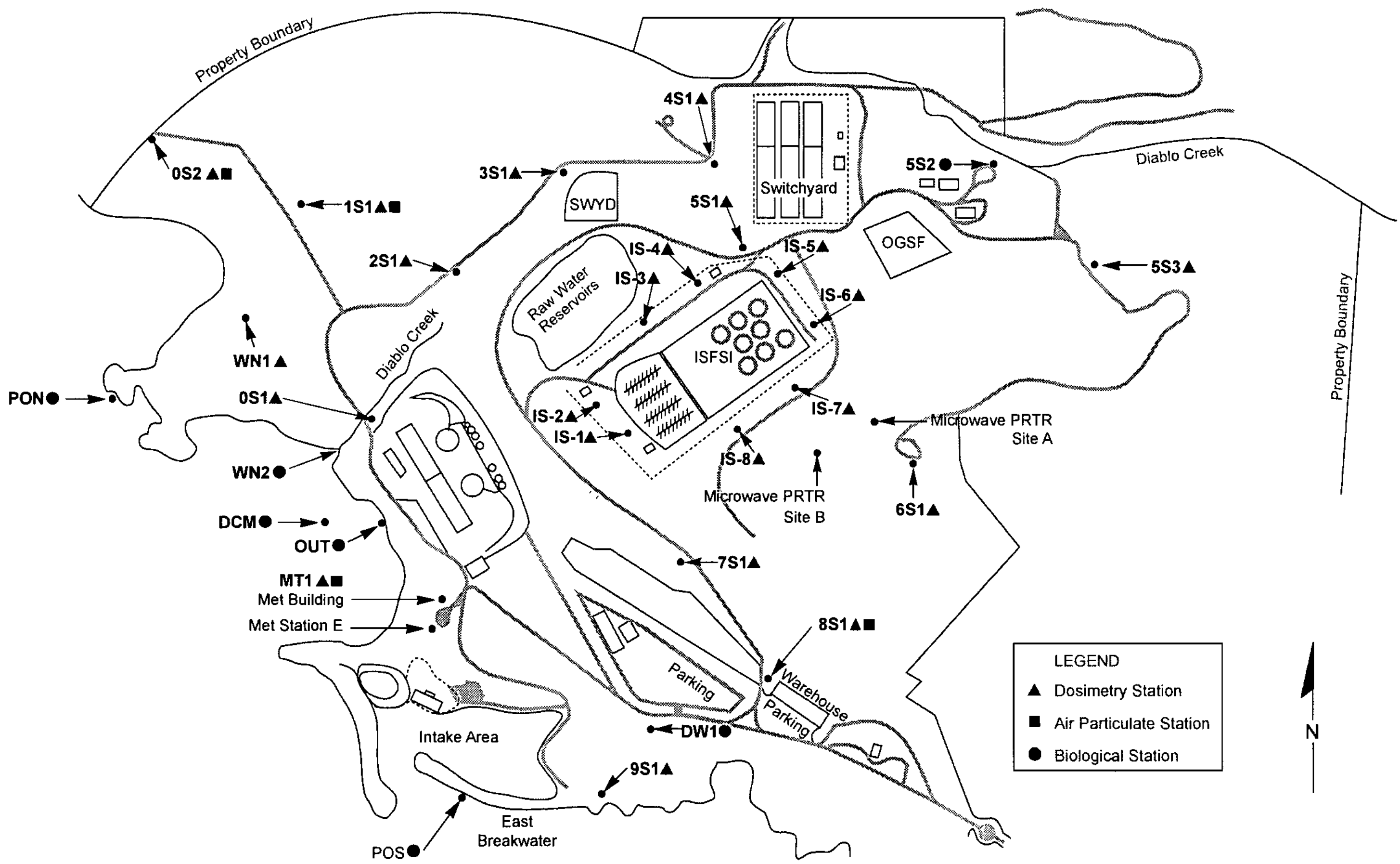
** If no drinking water pathway exists, a value of 20 pCi/L may be used

Figure 2.1- Diablo Canyon Off-site Stations



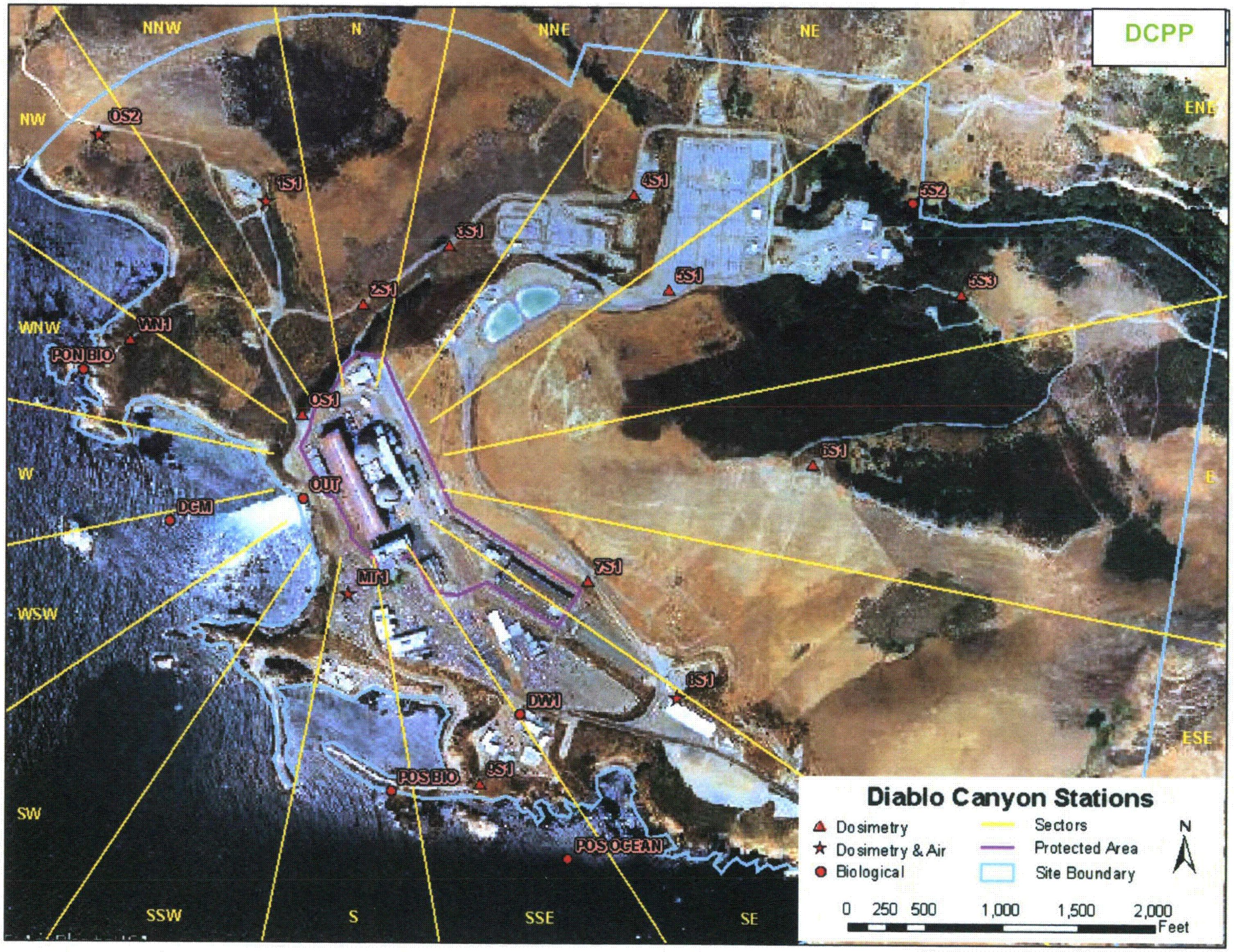
Units 1 and 2 Diablo Canyon off-site stations.

Figure 2.2- Diablo Canyon On-site Stations



DCPP Onsite ERMP Stations

Figure 2.3- Diablo Canyon Station Locations



DCPP
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3S1
4S1
5S1
5S2
5S3
6S1
7S1
8S1
9S1
WN1
PON BIO
OS1
OUT
DCM
MT1
DW1
POS BIO
POS OCEAN
Diablo Canyon Stations
Dosimetry
Dosimetry & Air
Biological
Sectors
Protected Area
Site Boundary
N
0 250 500 1,000 1,500 2,000
Feet

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 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

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.
- The number of detectable measurements and the total number of measurements. For example, (4/20) would indicate that 4 of the 20 samples collected, for that sample type and that radionuclide, contained detectable radioactivity.

A sample is considered to yield a "detectable measurement" when the concentration exceeds three times its associated standard deviation.

The radionuclides reported in this section represent those that:

1) had an LLD requirement in Table 2.3 of this report, or a Reporting Level listed in Table 2.4

2) 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.

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.

DIRECT RADIATION
There were no abnormal affects to the station TLD readouts.

AIRBORNE RADIOACTIVITY
The mean percent availability for all on-site and off-site air samplers was 99.5 percent. This means, on average, all air samplers were up and running 99.5 percent of the time. The remaining 0.5 percent can be attributed to equipment problems, filter exchange, and calibration processes.

Approximately 59.6 hours of air sampler lost run time occurred at stations 0S2 from 3-17-10 to 3-24-10 due to air sample pump equipment failure.

Approximately 163 hours of air sampler lost run time occurred at station 0S2 from 3-24-10 to 3-31-10 due to an automatic factory preset pump down power function. A new pump was placed at 0S2 on 3-24-10, however the technician did not ensure the factory preset was disabled. Therefore, the new pump turned itself off after 5 hours of runtime.

Approximately 51 hours of air sampler lost run time occurred at station 1S1 from 5-5-10 to 5-12-10 due to equipment malfunction.

Approximately 163 hours of air sampler lost run time occurred at station 1S1 from 5-12-10 to 5-19-10 due to an automatic factory preset pump down power function. A new pump was placed at 1S2 on 5-12-10, however the technician did not ensure the factory preset was disabled. Therefore, the new pump turned itself off after 5 hours of runtime. This was the second occurrence of a factory pre-set down power of a new air sample pump. The REMP air sampling procedure was revised to ensure factory pre-sets are disabled.

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.

TERRESTRIAL SAMPLES
All terrestrial samples were collected as scheduled (including allowable variation) with the exception of the August vegetation sample from REMP station 7C1. No vegetation was available at 7C1 during August of 2010. It should be noted that this vegetation sample is supplemental to the REMP.

First, second, and third quarter 3C1 vegetation samples were not provided by the landowner in 2010.

OCEAN SURFACE WATER, DRINKING WATER, AND GROUNDWATER SAMPLES
All water samples were collected as scheduled (including allowable variation).

REPLICATE SAMPLES
Replicate sampling is conducted within the REMP for program strength and correlation. Replicate samples were taken from 5F2 Vegetation (March), 5F2 Milk (March and May), DY1(March), OW1 (March), OW2 (March), and OEL Drinking Water (September). 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.

Air sampling station 0S2 during the week of 3-24-10 did not meet the particulate nor iodine cartridge a-priori LLDs due to the amount of lost runtime for that week. Air sampling station 1S1 during the week of 5-12-10 did not meet the particulate nor iodine cartridge a-priori LLDs due to the amount of lost runtime for that week. Approximately 163 hours of air sampler lost run time occurred at stations 0S2 and 1S1 due to an automatic factory preset pump down power function. Therefore, minimum sample volumes to achieve a-priori LLDs were not obtained for 0S2 during the week of 3-24-10 or for 1S1 during the week of 5-12-10.

All other REMP samples analyzed met the specific "a-priori" LLD requirements in 2010.

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.

4.4 DATA ANALYSIS BY MEDIA TYPE

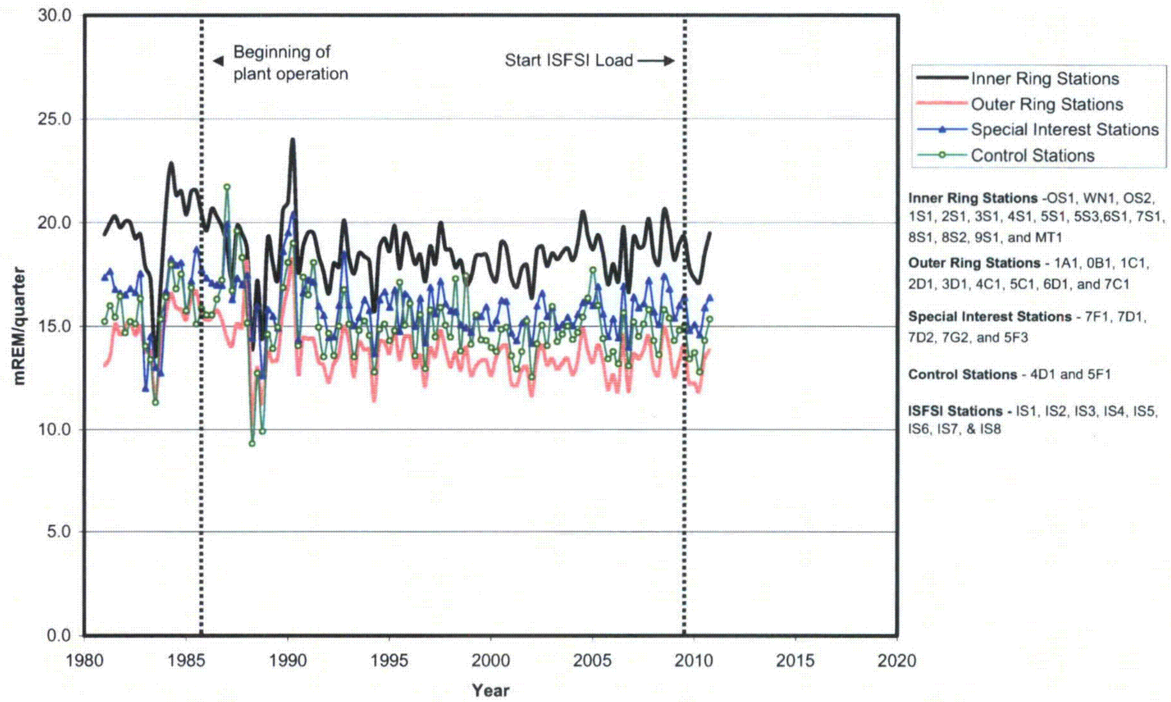
The REMP data for each media type is discussed below. A sample is considered to yield a "detectable measurement" when the concentration exceeds three times its associated standard deviation.

4.4.1 Direct Radiation

Direct radiation is continuously measured at 31 locations surrounding DCPP using 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. No adverse trends were noted in 2010 as indicated by the graph that follows.

Direct radiation is also continuously measured at 8 locations surrounding the Independent Spent Fuel Storage Installation (ISFSI) using thermoluminescent dosimeters (TLDs). These 8 locations 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 site boundary. 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. This second loading of spent fuel canisters is the reason for the increase in ISFSI TLD readings in mid 2010. No adverse trends were noted at the DCPP inner ring stations due to ISFSI for 2010 as indicated by the graphs that follow. It should be noted that the DCPP inner ring TLD results tracked in correlation with normal Environmental TLD outer ring, special interest, and control location fluctuations. It should also be noted that DCPP inner ring TLD results remain within pre-operational ranges.

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

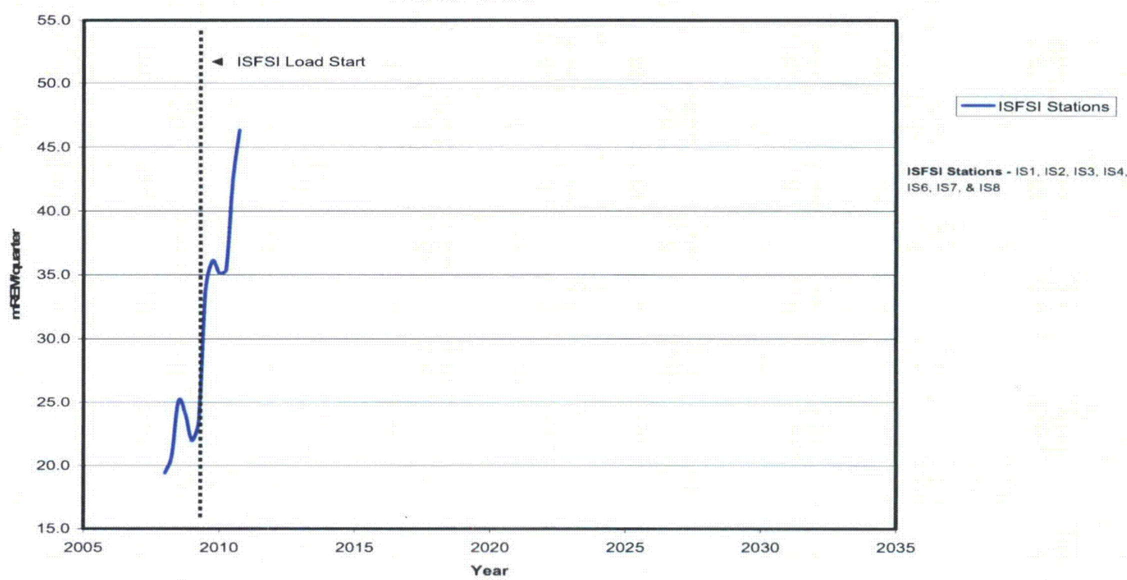
Outer Ring Stations - 1A1, 0B1, 1C1, 2D1, 3D1, 4C1, 5C1, 6D1, and 7C1

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

Control Stations - 4D1 and 5F1

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

ISFSI TLD Stations



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

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. The data collected for the air-sampling program is summarized in Appendix A.

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 station. All samples collected during the monitoring period contained only naturally occurring radioactivity.

A total of 364 iodine cartridges were analyzed for iodine-131. Iodine-131 was detected at control station 5F1 in San Luis Obispo (10 miles from DCPP) during the weeks of 3-17-10 and 3-24-10 in concentrations from 1.5E-2 pCi/m3 to 3.3E-2 pCi/m3. At this same time period, no other REMP air sample station detected I-131. An evaluation was conducted by DCPP and the California Dept of Public Health was notified of the abnormal event. DCPP could not identify the source of I-131 but concluded the most likely source was due to medical isotopes.

No Iodine-131 was detected in any of the remaining station iodine cartridges during 2010.

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.

Of all other samples collected during the monitoring period, no plant related radionuclides were detected in any of the samples.

Ocean Surface Water
Ocean surface water samples were collected monthly from stations OUT, DCM, and at 7C2 (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 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 water 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 is abandoned and the well pump is inoperable. Water Well 02 was sampled and only naturally occurring isotopes were detected.

One shallow (approximately 70 feet deep) subsurface monitoring well is located Southeast at approximately 0.3 miles from the power block. This monitoring well is labeled DCS96-1 (8S3). One tritium result indicated 325 pCi/Liter in November which is consistent with rain washout concentrations. The minimum detectable concentration for that sample was 208 pCi/Liter, so it was slightly above the detection limit. No other tritium or plant related isotopes were found in the 8S3 monitoring well during 2010.

Stations 5S2, WN2, and 1A2 are discussed in the previous Drinking Water paragraph of Section 4.4.3.

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 (approved discharge path), these monitoring wells contained low levels of tritium throughout 2010. All three of these monitoring wells were below the maximum concentration level (MCL) established by the U.S. Environmental Protection Agency (EPA) for tritium (20,000 picocuries per liter). Further reporting of these monitoring wells is provided in Section 5.2 of this report.

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.

Marine fish and mussel samples did not detect any DCPP related radionuclides during 2010.

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 2010.

Supplemental intertidal algae sampling was performed quarterly at REMP sample stations DCM and 7C2 (control). No DCPP related isotopes were detected in 2010.

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 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 naturally occurring isotopes where detected in the ocean sediment and recreational beach sand samples collected for 2010.

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 a residence garden at station 6C1. Samples were collected during the fourth quarter of 2010 from a garden at station 3C1. The samples were analyzed for gamma emitting radionuclides and for Iodine-131 on edible portions.

The results for these samples did not detect any DCPP related radionuclides. A summary of the sample results are provided in Appendix A.

4.4.6 Milk

There are no milking animals in the vicinity of the plant. 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.

The results of the milk sampling did not detect any DCPP related radionuclides.

A summary of the sample results are provided in Appendix A.

4.4.7 Meat Products

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

Samples of livestock meat were collected from the Blanchard Ranch in 2010. These samples were Blanchard cow meat (BCM), Blanchard sheep meat (BSM), and Blanchard goat meat (BGM).

No wild deer or wild pig meat samples were supplied by landowners in 2010.

A summary of the sample results are provided in Appendix A.

Only naturally occurring Potassium-40 was detected in these samples, no DCPP related radionuclides were detected.

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 2010.

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.

5.1.2 NEI 07-07 Objective 2.4 c, Annual Reporting:

2.4.c. i : A description of all spills or leaks that were communicated per GPI Objective 2.2 acceptance criterion a shall be included in the Annual Radiological Effluents Release Report (ARERR).

2.4.c.ii : All onsite or off-site ground water sample results that exceeded the REMP reporting thresholds as described in the ODCM that were communicated per GPI Objective 2.2 acceptance criterion b shall be included in the ARERR.

DCPP Response to NEI 07-07 Objective 2.4 c

Beginning with this 2010 annual report, the above GPI Section 2.4.c reporting has been moved over to the Annual Radiological Effluents Release Report (ARERR).

5.2 ADDITIONAL GROUNDWATER SAMPLING OVERVIEW:

Ground water monitoring is 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 is coming from the rain-washout of gaseous tritium exiting the plant vent system via an approved discharge route. 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 well samples for 2010 are as follows:
Observation Well 01 (1,280 – 2,120 pCi/L) of 5 samples collected for tritium analysis.
Observation Well 02 (1,140 – 1,540 pCi/L) of 5 samples collected for tritium analysis.
Drywell 115 (5,740 – 7,670 pCi/L) of 5 samples collected for tritium analysis.
No other DCPP related isotopes were detected.

Monitoring Well 8S3 was sampled 4 times in 2010. One of the samples indicated 325 pCi/L of tritium which was slightly above the MDC of 208 pCi/L. This concentration of tritium is consistent with rain washout concentrations. The other three 8S3 tritium samples were < MDC. No other DCPP related isotopes were detected.

All other samples of groundwater at 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.

On 3-2-08, the DCPP Unit Two (U-2) Steam Generators were replaced and the old U-2 Steam Generators (4 total) were stored onsite within the Old Steam Generator Storage Facility (OSGSF) mausoleum.

On 2-14-09, the DCPP Unit One (U-1) Steam Generators were replaced and the old U-1 Steam Generators (4 total) were stored onsite within the OSGSF mausoleum.

On 11-6-09, the DCPP Unit Two (U-2) Reactor (Rx) Head was replaced and the old U-2 Rx Head was stored onsite within the OSGSF mausoleum.

On 10-23-10, the DCPP Unit One (U-1) Rx Head was replaced and the old U-1 Rx Head was stored onsite within the OSGSF mausoleum.

As of 12-31-10, the OSGSF contains eight old Steam Generators and two old Rx Heads.

The OSGSF building sumps were inspected quarterly by the REMP. Rainwater was found in the U-2 Old Steam Generator vault # 30 sump. This rainwater had tritium concentrations consistent with rainwater washout concentrations at < 1,000 pCi/Liter. The rainwater from the sump was removed and processed via an approved radwaste discharge pathway.

7.0 CROSS CHECK PROGRAM

GEL Laboratories LLC

2010 ANNUAL QUALITY ASSURANCE REPORT

FOR THE

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM (REMP)

JANUARY 2010 – DECEMBER 2010

GEL LABORATORIES, LLC
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2010 ANNUAL QUALITY ASSURANCE REPORT

FOR THE

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM (REMP)

JANUARY 2010 – DECEMBER 2010

Prepared By: Martha J Harrison
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February 15, 2011
Date

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Robert L. Pullano
Director, Quality Systems

February 15, 2011
Date

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2010 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 2010. 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 2010.
- Inter-laboratory QC results analyzed during 2010 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.
- New York State Department of Health Environmental Laboratory Approval Program Proficiency Testing Program for Potable Water (PW)
- 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 (10-RAD-001) was conducted in March 2010. Four findings, one observation, and two recommendations resulted from this assessment. Each finding was closed and appropriate laboratory staff addressed each observation and recommendation. The internal audit closed in June 2010.

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 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 2010, forty-three radioisotopes associated with six matrix types were analyzed under GEL's Performance Evaluation program in participation with ERA, MAPEP, NYSDOH ELAP and Eckert & Ziegler Analytics. Matrix types were representative of client analyses performed during 2010. The list below contains the type of matrix evaluated by GEL.

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

Graphs are provided in Figures 1-8 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, and Iodine-131. A summary of GEL's quality control for radiological analyses by isotopic analysis and matrix are represented in Table 8. Each LCS and DUP represents a batch of samples for each isotopic analysis. This summary contains the number of reportable quality control results for our clients.

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

During 2010, Eckert & Ziegler Analytics provided samples for 106 individual environmental analyses. Of the 106 analyses, 99% (105 out of 106) of all results fell within the PT provider's acceptance criteria. The only analytical failure occurred with the analysis of Iron-59 in milk. For the corrective action associated with the Iron-59 failure, refer to CARR110209-542 (Table 9).

9. Summary of Participation in the MAPEP Monitoring Program

During 2010, one set of MAPEP samples (MAPEP 22) was analyzed by the laboratory. Of the 66 analyses, 80% (53 out of 66) of all results fell within the PT provider's acceptance criteria. Thirteen analytical failures occurred: Plutonium-238 in water, Uranium-235 in filter, Uranium-238 in filter, Uranium-Total in filter, Americium-241 in filter, Cesium-134 in filter, Cesium-137 in filter, Cobalt-60 in filter, Manganese-54 in filter, Plutonium-239/240 in filter, Uranium-244/243 in filter, Uranium-238 in filter, and Uranium-238 in vegetation.

For the corrective action associated MAPEP 22, refer to CARR100617-496 (Table 9). The ICP-MS analysis of Uranium-235 and Uranium-238 failure was attributed to the use of the less vigorous digestion method (EPA Method 3050B). After contacting RESL, GEL discovered that they had used a more rigorous total dissolution process. The failure for Plutonium-238 was attributed to a data reviewer's error and lack of attention to detail to the region of interest that was not included in the data result. Approximately 400 additional counts should have been included. For the remaining isotopic failures, the error was attributed to analyst error and failure to follow the instructions from the PT provider.

10. Summary of Participation in the ERA MRaD PT Program

During 2010, the ERA MRad program provided samples (MRAD-12 and MRAD-13) for 175 individual environmental analyses. Of the 175 analyses, 96% (169 out of 176) of all results fell within the PT provider's acceptance criteria. Six analytical failures occurred: Uranium-234 in soil, Uranium-238 in soil, Uranium-238 in vegetation, Plutonium-238 in water, Uranium-238 in water, and Bismuth-212 in soil.

For the corrective actions associated with MRAD 12 and MRAD-13, refer to corrective actions CARR100617-497 and CARR101210-527, respectively (Table 9). For MRAD-12, the ICP-MS analysis of Uranium-235 and Uranium-238 failure was attributed to the use of the less vigorous digestion method (EPA Method 3050B). After contacting RESL, GEL discovered that they had used a more rigorous total dissolution process. For Uranium-238 in vegetation, air and water, the failure was attributed to method sensitivity by gamma spectroscopy. Future PT analysis will be performed using a more sensitive method.

For MRAD-13, the failure for Bismuth-212 was attributed to a reporting error. The actual result (1660 pCi/kg) was within the acceptance range. The failure of Iron-55 was attributed to matrix interference. An additional recount with a smaller aliquot and fresh reagent rinses removed the interferant.

11. Summary of Participation in the ERA PT Program

During 2010, the ERA program provided samples (RAD-80 and RAD-82) for 53 individual environmental analyses. Of the 53 analyses, 77% (41 out of 53) of all results fell within the PT provider's acceptance criteria. Twelve analytical failures occurred: Strontium-89 in water, Strontium-90 in water, Barium-133 in water, Cesium-134 in water, Cesium-137 in water, Cobalt-60 in water, Zinc-65 in water, Uranium (Natural) in water, Uranium (Nat) Mass in water, Strontium-90 in water, Cesium-134 in water, and Zinc-65 in water.

For the corrective actions associated with RAD-80 and RAD-82, refer to corrective actions CARR100318-487 and CARR100907-512, respectively (Table 9). For RAD-80, the Gross Alpha failure was attributed to a concentrated iron carrier. The Strontium-89 and Strontium-90 failures were attributed to the associated weights of the carriers utilized during the preparation and analysis.

For RAD-82, failures of the Gamma Emitters and the Naturals (Uranium) were attributed to analyst error and failure to follow the instructions from the PT provider. The failure of Strontium-89 and Strontium-90 was attributed to analyst error while diluting the sample.

12. Summary of Participation in the New York ELAP PT Program

During 2010, the NYSDOH ELAP PT program provided 30 individual tests for radiological analysis. Of the 30 analyses, 83% (25 out of 30) of the results were within the PT provider's acceptance criteria. Five analytical failures occurred: Cesium-134 in water, Iodine-131 in water (two), Strontium-89 in water, and Radium-226 in water.

For the corrective actions associated with NY-337, refer to corrective action CARR101203-525 (Table 9). For Cesium-134, Iodine-131, Strontium-89 and Strontium-90, and Radium-226, the failures could not be determined. The laboratory continues to monitor results of internal quality control samples.

In addition, GEL (Lab ID# E87156, Lab Code# SC00012) maintained primary NELAP accreditation from the Florida Department of Health for the following methods in potable water and non-potable water. The radiological analytes and methods are listed below.

- Gross Alpha: EPA 900.0, EPA 1984 00-02

- Gross Beta: EPA 900.0
- Iodine-131: DOE 4.5.2.3, EPA 901.1, EPA 902.0
- Photon Emitters: DOE 4.5.2.3, EPA 901.1
- Radioactive Cesium: DOE 4.5.2.3, EPA 901.1
- Tritium: EPA 906.0
- Radium-226: EPA 903.1, EPA 1984 Ra-04
- Radium-228: EPA 904.0, EPA 1976 PP.24
- Radon: SM 20 7500 Rn, DOE 1990 Sr-02
- Strontium-89: EPA 905.0
- Strontium-90: EPA 905.0
- Uranium (Activity): DOE 1990 U-02, ASTM D5174-97, 02

13. Quality Control Program for REMP Analyses

GEL's internal (intra-laboratory) quality control program evaluated 1590 individual analyses for bias and 1591 analyses for precision for standard REMP matrix and radionuclides. Of the 959 internal quality control analyses evaluated for bias, 100% met laboratory acceptance criteria. In addition, 100% of the 1591 results for precision were found to be acceptable. The results are summarized in Table 8.

GEL performs low-level analysis specifically for Tritium in water. A chart of low activity H-3 spike performance is provided in Figure 8. All 2010 analyses were within the acceptance criteria.

14. 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 9 provides the status of CARRs for radiological performance testing during 2010.

15. 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
2010 RADIOLOGICAL PROFICIENCY TESTING RESULTS AND ACCEPTANCE CRITERIA

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
RAD - 80	1st / 2010	Water	pCi/L	Barium-133	73.5	72.9	61.0 - 80.2	Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Cesium-134	69.2	63.4	51.5 - 69.7	Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Cesium-137	118.0	120	108 - 134	Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Cobalt-60	87.7	90	81 - 101	Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Gross Alpha	51.3	42.5	22.0 - 53.9	Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Gross Beta	52.0	54.2	37.0 - 61.1	Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Iodine-131	30.5	28.2	23.5 - 33.1	Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Radium-226	16.9	17.8	13.2 - 20.3	Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Radium-228	20.4	18.2	12.3 - 21.8	Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Strontium-89	37.9	53.3	42.3 - 60.9	Not Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Strontium-90	52.3	42.2	31.1 - 48.4	Not Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Tritium	19200	18700	16400-20600	Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Uranium (Nat)	49.0	50.2	40.7 - 55.8	Acceptable
RAD - 80	1st / 2010	Water	ug/L	Uranium (Nat) Mass	67.3	73.2	59.4 - 81.4	Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Zinc-65	213.0	210	189 - 246	Acceptable
E6922-278	2nd / 2010	Cartridge	pCi	Iodine-131	9.02E+01	9.39E+01	0.96	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Iodine-131	8.25E+01	8.73E+01	0.95	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Iodine-131	1.00E+02	9.61E+01	1.04	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Iron-59	1.88E+02	1.78E+02	1.06	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Iron-59	1.94E+02	1.79E+02	1.08	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Manganese-54	1.83E+02	1.78E+02	1.03	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Manganese-54	1.90E+02	1.79E+02	1.06	Acceptable
E6923-278	2nd / 2010	Milk	pCi/L	Strontium-89	9.73E+01	1.31E+02	0.75	Acceptable
E6923-278	2nd / 2010	Milk	pCi/L	Strontium-90	1.38E+01	1.79E+01	0.77	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Zinc-65	3.68E+02	3.45E+02	1.07	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Zinc-65	3.72E+02	3.48E+02	1.07	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Cerium-141	2.01E+02	2.02E+02	0.99	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Cerium-141	2.04E+02	2.04E+02	1.00	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Cesium-134	2.41E+02	2.53E+02	0.95	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Cesium-134	2.56E+02	2.55E+02	1.00	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Cesium-137	1.71E+02	1.79E+02	0.96	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Cesium-137	1.81E+02	1.81E+02	1.00	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Cobalt-58	2.03E+02	2.11E+02	0.96	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Cobalt-58	2.19E+02	2.13E+02	1.03	Acceptable

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
E6924-278	2nd / 2010	Milk	pCi/L	Cobalt-60	2.47E+02	2.56E+02	0.97	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Cobalt-60	2.67E+02	2.58E+02	1.03	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Cr-51	5.54E+02	5.48E+02	1.01	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Cr-51	5.78E+02	5.54E+02	1.04	Acceptable
E7054-278	2nd / 2010	Milk	pCi/L	Cerium-141	2.61E+02	2.61E+02	1.00	Acceptable
E7055-278	2nd / 2010	Water	pCi/L	Cerium-141	2.78E+02	2.63E+02	1.06	Acceptable
E7054-278	2nd / 2010	Milk	pCi/L	Cesium-134	1.76E+02	1.78E+02	0.99	Acceptable
E7055-278	2nd / 2010	Water	pCi/L	Cesium-134	1.85E+02	1.79E+02	1.03	Acceptable
E7054-278	2nd / 2010	Milk	pCi/L	Cesium-137	1.61E+02	1.58E+02	1.02	Acceptable
E7055-278	2nd / 2010	Water	pCi/L	Cesium-137	1.71E+02	1.59E+02	1.07	Acceptable
E7054-278	2nd / 2010	Milk	pCi/L	Cobalt-58	1.45E+02	1.43E+02	1.02	Acceptable
E7055-278	2nd / 2010	Water	pCi/L	Cobalt-58	1.51E+02	1.44E+02	1.05	Acceptable
E7054-278	2nd / 2010	Milk	pCi/L	Cobalt-60	1.90E+02	1.83E+02	1.04	Acceptable
E7055-278	2nd / 2010	Water	pCi/L	Cobalt-60	1.94E+02	1.85E+02	1.05	Acceptable
E7054-278	2nd / 2010	Milk	pCi/L	Cr-51	3.81E+02	3.61E+02	1.05	Acceptable
E7055-278	2nd / 2010	Water	pCi/L	Cr-51	3.86E+02	3.64E+02	1.06	Acceptable
E7052-278	2nd / 2010	Cartridge	pCi	Iodine-131	8.58E+01	8.54E+01	1.00	Acceptable
E7054-278	2nd / 2010	Milk	pCi/L	Iodine-131	6.91E+01	7.40E+01	0.93	Acceptable
E7055-278	2nd / 2010	Water	pCi/L	Iodine-131	8.12E+01	7.22E+01	1.12	Acceptable
E7054-278	2nd / 2010	Milk	pCi/L	Iron-59	1.60E+02	1.37E+02	1.17	Acceptable
E7055-278	2nd / 2010	Water	pCi/L	Iron-59	1.60E+02	1.38E+02	1.16	Acceptable
E7054-278	2nd / 2010	Milk	pCi/L	Manganese-54	2.10E+02	2.07E+02	1.01	Acceptable
E7055-278	2nd / 2010	Water	pCi/L	Manganese-54	2.30E+02	2.09E+02	1.1	Acceptable
E7053-278	2nd / 2010	Milk	pCi/L	Strontium-89	7.91E+01	9.28E+01	0.85	Acceptable
E7053-278	2nd / 2010	Milk	pCi/L	Strontium-90	1.12E+01	1.27E+01	0.88	Acceptable
E7054-278	2nd / 2010	Milk	pCi/L	Zinc-65	2.71E+02	2.54E+02	1.07	Acceptable
E7055-278	2nd / 2010	Water	pCi/L	Zinc-65	2.97E+02	2.56E+02	1.16	Acceptable
NY-332 3262	2nd / 2010	Water	pCi/L	Barium-133	27.8	25.6	20.6 - 30.5	Acceptable
NY-332 3262	2nd / 2010	Water	pCi/L	Cesium-134	14.8	14.0	10.7 - 17.3	Acceptable
NY-332 3262	2nd / 2010	Water	pCi/L	Cesium-137	124	123	112 - 134	Acceptable
NY-332 3262	2nd / 2010	Water	pCi/L	Cobalt-60	98.3	99.5	90.3 - 109	Acceptable
NY-332 3263	2nd / 2010	Water	pCi/L	Gross Alpha	33.0	26.8	15.0 - 38.6	Acceptable
NY-332 3263	2nd / 2010	Water	pCi/L	Gross Beta	64.6	54.0	41.3 - 66.7	Acceptable
NY-332 3264	2nd / 2010	Water	pCi/L	Iodine-131	23.4	26.4	21.9 - 31.0	Acceptable
NY-332 3264	2nd / 2010	Water	pCi/L	Iodine-131	26.8	26.4	21.9 - 31.0	Acceptable
NY-332 3265	2nd / 2010	Water	pCi/L	Radium-226	12.1	13.2	10.4 - 16.0	Acceptable
NY-332 3265	2nd / 2010	Water	pCi/L	Radium-228	9.90	8.91	6.08 - 11.7	Acceptable

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
NY-332 3261	2nd / 2010	Water	pCi/L	Strontium-89	46.7	41.9	33.4 - 50.4	Acceptable
NY-332 3261	2nd / 2010	Water	pCi/L	Strontium-90	33.9	34.8	27.1 - 42.5	Acceptable
NY-332 3266	2nd / 2010	Water	pCi/L	Tritium	9610	9490	8390 - 10600	Acceptable
NY-332 3265	2nd / 2010	Water	pCi/L	Uranium (activity)	48.81	44.7	37.9 - 51.4	Acceptable
NY-332 3262	2nd / 2010	Water	pCi/L	Zinc-65	146	139	121 - 156	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Actinium-228	1570	1850	1190 - 2600	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Americium-241	1130	1500	896 - 1930	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Americium-241	1120	1500	896 - 1930	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Americium-241	2410	3140	1790 - 4310	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Americium-241	3600	3140	1790 - 4310	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Americium-241	52.7	60.0	35.1 - 82.3	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Americium-241	76	60	35.1 - 82.3	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Americium-241	79.1	95.6	65.5 - 129	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Americium-241	123	95.6	65.5 - 129	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Bismuth-212	1430	1640	430 - 2450	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Bismuth-214	1080	1410	865 - 2030	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Cesium-134	3040	3110	2000 - 3740	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Cesium-134	1750	1670	956 - 2310	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Cesium-134	504	436	284 - 540	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Cesium-134	454	417	308 - 479	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Cesium-137	4330	4440	3400 - 5770	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Cesium-137	1550	1470	1080 - 2040	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Cesium-137	785	701	527 - 921	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Cesium-137	693	654	556 - 783	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Cobalt-60	2120	2140	1560 - 2870	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Cobalt-60	2100	1970	1330 - 2830	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Cobalt-60	591	523	405 - 653	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Cobalt-60	813	727	633 - 859	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Curium-244	429	528	260 - 822	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Gross Alpha	68.2	79.6	41.3 - 120	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Gross Beta	72	70.4	43.4 - 103	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Iron-55	375	359	158 - 559	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Lead-212	1540	1520	980 - 2140	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Lead-214	1300	1440	862 - 2140	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Manganese-54	< 22.9	0	-----	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Manganese-54	< 9.6	0.00	-----	Acceptable

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Manganese-54	< 5.07	0.00	-----	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Manganese-54	< 7.7	0.00	-----	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Plutonium-238	1360	1330	761 - 1870	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Plutonium-238	3090	3040	1640 - 4450	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Plutonium-238	63.9	64.1	44.0 - 84.3	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Plutonium-238	79.5	109	82.4 - 135	Not Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Plutonium-239	1220	1260	860 - 1670	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Plutonium-239	2830	2800	1740 - 3820	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Plutonium-239	56.6	56.7	41.1 - 73.4	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Plutonium-239	103	105	81.2 - 130	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Potassium-40	11100	10900	7900 - 14800	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Potassium-40	40800	34900	25100 - 49400	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Strontium-90	7870	8180	2960 - 13300	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Strontium-90	7870	8180	2960 - 13300	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Strontium-90	7880	9120	5100 - 12100	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Strontium-90	178	187	82.3 - 291	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Strontium-90	708	719	456 - 961	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Thorium-234	1600	1610	511 - 3070	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Uranium-234	1230	1620	1030 - 2010	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Uranium-234	1680	1720	1180 - 2280	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Uranium-234	68.8	62.1	39.1 - 92.0	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Uranium-234	62.4	61.4	46.3 - 79.2	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Uranium-234	< 1158	1620	1030 - 2010	Not Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Uranium-238	1600	1610	984 - 2040	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Uranium-238	908	1610	984 - 2040	Not Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Uranium-238	1440	1610	984 - 2040	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Uranium-238	1604	1710	1200 - 2160	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Uranium-238	1770	1710	1200 - 2160	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Uranium-238	< 1240	1710	1200 - 2160	Not Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Uranium-238	61.5	61.5	39.4 - 87.3	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Uranium-238	69.5	61.5	39.4 - 87.3	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Uranium-238	< 61.2	61.5	39.4 - 87.3	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Uranium-238	67.9	60.9	46.5 - 75.5	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Uranium-238	66.1	60.9	46.5 - 75.5	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Uranium-238	< 155	60.9	46.5 - 75.5	Not Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Uranium-Total	2789	3300	1880 - 4460	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Uranium-Total	3536	3510	2410 - 4530	Acceptable

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MRAD-12	2nd / 2010	Soil	ug/kg	Uranium-Total (mass)	2920	4820	2650 - 6060	Acceptable
MRAD-12	2nd / 2010	Vegetation	ug/kg	Uranium-Total (mass)	5270	5120	3520 - 6610	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Uranium-Total (mass)	5290	5120	3520 - 6610	Acceptable
MRAD-12	2nd / 2010	Air Filter	ug/Filter	Uranium-Total (mass)	183	184	114 - 264	Acceptable
MRAD-12	2nd / 2010	Air Filter	ug/Filter	Uranium-Total (mass)	208	184	114 - 264	Acceptable
MRAD-12	2nd / 2010	Air Filter	ug/Filter	Uranium-Total (mass)	175	184	114 - 264	Acceptable
MRAD-12	2nd / 2010	Water	ug/L	Uranium-Total (mass)	213	182	143 - 225	Acceptable
MRAD-12	2nd / 2010	Water	ug/L	Uranium-Total (mass)	198	182	143 - 225	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Zinc-65	2790	2470	1960 - 3310	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Zinc-65	1630	1360	983 - 1860	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Zinc-65	462	389	269 - 539	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Zinc-65	632	533	452 - 664	Acceptable
RAD - 82	3rd / 2010	Water	pCi/L	Barium-133	112.0	89.1	75.0 - 98.0	Not Acceptable
RAD - 82	3rd / 2010	Water	pCi/L	Cesium-134	115.0	88.3	72.4 -97.1	Not Acceptable
RAD - 82	3rd / 2010	Water	pCi/L	Cesium-137	271	210	189 - 232	Not Acceptable
RAD - 82	3rd / 2010	Water	pCi/L	Cobalt-60	98.4	72.8	65.5 - 82.5	Not Acceptable
RAD - 82	3rd / 2010	Water	pCi/L	Gross Alpha	65.5	61.1	32.0 - 75.9	Acceptable
RAD - 82	3rd / 2010	Water	pCi/L	Gross Beta	56.7	56.4	38.6 - 63.6	Acceptable
RAD - 82	3rd / 2010	Water	pCi/L	Iodine-131	32.2	28.4	23.6 - 33.3	Acceptable
RAD - 82	3rd / 2010	Water	pCi/L	Radium-226	15.9	17.1	12.7 - 19.6	Acceptable
RAD - 82	3rd / 2010	Water	pCi/L	Radium-228	18.9	16.1	10.8 - 19.4	Acceptable
RAD - 82	3rd / 2010	Water	pCi/L	Strontium-89	60.6	55.3	44.1 - 62.9	Acceptable
RAD - 82	3rd / 2010	Water	pCi/L	Strontium-90	47.1	32.8	24.0 - 38.0	Not Acceptable
RAD - 82	3rd / 2010	Water	pCi/L	Tritium	18500	19800	17300 - 21700	Acceptable
RAD - 82	3rd / 2010	Water	pCi/L	Uranium (Nat)	58.0	49.6	40.2 - 55.1	Not Acceptable
RAD - 82	3rd / 2010	Water	ug/L	Uranium (Nat) Mass	89.1	72.3	58.7 - 80.4	Not Acceptable
RAD - 82	3rd / 2010	Water	pCi/L	Zinc-65	161	110	99.0 - 131	Not Acceptable
MAPEP-10-MaS22	3rd / 2010	Soil	Bq/kg	Americium-241	0.07	0.00	-----	Acceptable
MAPEP-10-RdF22	3rd / 2010	Filter	Bq/sample	Americium-241	0.2637	0.146	0.102 - 0.190	Not Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	Bq/sample	Americium-241	0.179	0.225	0.158 - 0.293	Acceptable
MAPEP-10-MaS22	3rd / 2010	Soil	Bq/kg	Cesium-134	744.67	733	513 - 953	Acceptable
MAPEP-10-RdF22	3rd / 2010	Filter	Bq/sample	Cesium-134	4.323	2.13	1.49 - 2.77	Not Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	Bq/sample	Cesium-134	3.098	4.39	3.07 - 5.71	Acceptable

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MAPEP-10-MaS22	3rd / 2010	Soil	Bq/kg	Cesium-137	831.7	779	545 - 1013	Acceptable
MAPEP-10-RdF22	3rd / 2010	Filter	Bq/sample	Cesium-137	3.070	1.53	1.07 - 1.99	Not Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	Bq/sample	Cesium-137	2.185	3.06	2.14 - 3.98	Acceptable
MAPEP-10-MaS22	3rd / 2010	Soil	Bq/kg	Cobalt-57	536.0	522	365 - 679	Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	Bq/sample	Cobalt-57	0.009	0.00	-----	Acceptable
MAPEP-10-MaS22	3rd / 2010	Soil	Bq/kg	Cobalt-60	670.3	622	435 - 809	Acceptable
MAPEP-10-RdF22	3rd / 2010	Filter	Bq/sample	Cobalt-60	5.187	2.473	1.731 - 3.215	Not Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	Bq/sample	Cobalt-60	3.076	3.27	2.29 - 4.25	Acceptable
MAPEP-10-GrF22	3rd / 2010	Filter	Bq/sample	Gross Alpha	0.303	0.427	>0.0 - 0.854	Acceptable
MAPEP-10-GrF22	3rd / 2010	Filter	Bq/sample	Gross Beta	1.433	1.29	0.65 - 1.94	Acceptable
MAPEP-10-MaS22	3rd / 2010	Soil	Bq/kg	Iron-55	83.6	0.00	-----	Acceptable
MAPEP-10-MaS22	3rd / 2010	Soil	Bq/kg	Manganese-54	940.7	849	594 - 1104	Acceptable
MAPEP-10-RdF22	3rd / 2010	Filter	Bq/sample	Manganese-54	6.483	3.02	2.11 - 3.93	Not Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	Bq/sample	Manganese-54	0.004	0.00	-----	Acceptable
MAPEP-10-MaS22	3rd / 2010	Soil	Bq/kg	Nickel-63	489	477	334 - 620	Acceptable
MAPEP-10-MaS22	3rd / 2010	Soil	Bq/kg	Plutonium-238	17.9	24	16.9 - 31.3	Acceptable
MAPEP-10-RdF22	3rd / 2010	Filter	Bq/sample	Plutonium-238	0.010	0.0010	-----	Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	Bq/sample	Plutonium-238	0.149	0.160	0.112 - 0.208	Acceptable
MAPEP-10-MaS22	3rd / 2010	Soil	Bq/kg	Plutonium-239/240	0.21	0.00	-----	Acceptable
MAPEP-10-RdF22	3rd / 2010	Filter	Bq/sample	Plutonium-239/240	0.164	0.0832	0.0582 - 0.1082	Not Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	Bq/sample	Plutonium-239/240	0.0026	0.0008	-----	Acceptable
MAPEP-10-MaS22	3rd / 2010	Soil	Bq/kg	Potassium-40	638.7	559	391 - 727	Acceptable
MAPEP-10-MaS22	3rd / 2010	Soil	Bq/kg	Strontium-90	261.0	288	202 - 374	Acceptable
MAPEP-10-RdF22	3rd / 2010	Filter	Bq/sample	Strontium-90	-0.004	0.00	-----	Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	Bq/sample	Strontium-90	0.033	0.00	-----	Acceptable
MAPEP-10-MaS22	3rd / 2010	Soil	Bq/kg	Technetium-99	-3.0	0.00	-----	Acceptable
MAPEP-10-MaS22	3rd / 2010	Soil	Bq/kg	Uranium-234/233	65.27	60	42 -78	Acceptable
MAPEP-10-RdF22	3rd / 2010	Filter	Bq/sample	Uranium-234/233	0.137	0.068	0.048 - 0.088	Not Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	Bq/sample	Uranium-234/233	0.184	0.216	0.151 - 0.281	Acceptable
MAPEP-10-RdF22	3rd / 2010	Filter	ug/sample	Uranium-235	0.0756	0.0381	0.0267 - 0.0495	Not Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	ug/sample	Uranium-235	0.090	0.1250	0.0875 - 0.1625	Acceptable

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MAPEP-10-MaS22	3rd / 2010	Soil	Bq/kg	Uranium-238	70.23	64	45 - 83	Acceptable
MAPEP-10-RdF22	3rd / 2010	Filter	ug/sample	Uranium-238	10.2	5.7	4.0 - 7.4	Not Acceptable
MAPEP-10-RdF22	3rd / 2010	Filter	Bq/sample	Uranium-238	0.147	0.071	0.050 - 0.092	Not Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	ug/sample	Uranium-238	12.5	17.9	12.5 - 23.3	Not Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	Bq/sample	Uranium-238	0.184	0.223	0.156 - 0.290	Acceptable
MAPEP-10-RdF22	3rd / 2010	Filter	ug/sample	Uranium-Total	10.2	5.7	4.0 - 7.4	Not Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	ug/sample	Uranium-Total	13.9	18.0	12.6 - 23.4	Acceptable
MAPEP-10-MaS22	3rd / 2010	Soil	Bq/kg	Zinc-65	-2.89	0.0	-----	Acceptable
MAPEP-10-RdF22	3rd / 2010	Filter	Bq/sample	Zinc-65	-0.106	0.00	-----	Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	Bq/sample	Zinc-65	6.844	7.10	4.97 - 9.23	Acceptable
E7119-278	3rd / 2010	Milk	pCi/L	Cesium-134	1.37E+02	1.26E+02	1.09	Acceptable
E7119-278	3rd / 2010	Milk	pCi/L	Cesium-137	1.68E+02	1.50E+02	1.12	Acceptable
E7119-278	3rd / 2010	Milk	pCi/L	Cobalt-58	1.13E+02	1.01E+02	1.12	Acceptable
E7119-278	3rd / 2010	Milk	pCi/L	Cobalt-60	2.14E+02	1.97E+02	1.09	Acceptable
E7119-278	3rd / 2010	Milk	pCi/L	Cr-51	3.90E+02	3.39E+02	1.15	Acceptable
E7117-278	3rd / 2010	Milk	pCi/L	Iodine-131	7.97E+01	8.02E+01	0.99	Acceptable
E7119-278	3rd / 2010	Milk	pCi/L	Iodine-131	1.06E+02	9.69E+01	1.09	Acceptable
E7119-278	3rd / 2010	Milk	pCi/L	Iron-59	1.55E+02	1.19E+02	1.30	Not Acceptable
E7119-278	3rd / 2010	Milk	pCi/L	Manganese-54	1.99E+02	1.69E+02	1.18	Acceptable
E7118-278	3rd / 2010	Milk	pCi/L	Strontium-89	7.95E+01	9.34E+01	0.85	Acceptable
E7118-278	3rd / 2010	Milk	pCi/L	Strontium-90	1.57E+01	1.67E+01	0.94	Acceptable
E7119-278	3rd / 2010	Milk	pCi/L	Zinc-65	2.40E+02	2.06E+02	1.17	Acceptable
090710N	3rd / 2010	Water	pCi/L	Barium-133	86.9	92.9	78.3 - 102	Acceptable
090710N	3rd / 2010	Water	pCi/L	Cesium-134	93.8	79.4	65.0 - 87.3	Not Acceptable
090710N	3rd / 2010	Water	pCi/L	Cesium-137	55.5	54.6	49.1 - 62.9	Acceptable
090710N	3rd / 2010	Water	pCi/L	Cobalt-60	120.0	117	105 - 131	Acceptable
090710N	3rd / 2010	Water	pCi/L	Uranium (Nat)	34.9	33.8	27.3 - 37.8	Acceptable
090710N	3rd / 2010	Water	ug/L	Uranium (Nat) Mass	48.6	49.3	39.8 - 55.1	Acceptable
090710N	3rd / 2010	Water	pCi/L	Zinc-65	129	99.5	89.6 - 119	Not Acceptable
MAPEP-10-MaW22	3rd / 2010	Water	Bq/L	Americium-241	1.0323	1.30	0.91 - 1.69	Acceptable
MAPEP-10-MaW22	3rd / 2010	Water	Bq/L	Cesium-134	0.027	0.00	-----	Acceptable
MAPEP-10-MaW22	3rd / 2010	Water	Bq/L	Cesium-137	63.1	60.6	42.4 - 78.8	Acceptable
MAPEP-10-MaW22	3rd / 2010	Water	Bq/L	Cobalt-57	29.2	28.3	19.8 - 36.8	Acceptable
MAPEP-10-MaW22	3rd / 2010	Water	Bq/L	Cobalt-60	-0.021	0.00	-----	Acceptable

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MAPEP-10-GrW22	3rd / 2010	Water	Bq/L	Gross Alpha	0.559	0.676	>0.0 - 1.352	Acceptable
MAPEP-10-GrW22	3rd / 2010	Water	Bq/L	Gross Beta	3.110	3.09	1.55 - 4.64	Acceptable
MAPEP-10-MaW22	3rd / 2010	Water	Bq/L	Iron-55	0.24	0.00	-----	Acceptable
MAPEP-10-MaW22	3rd / 2010	Water	Bq/L	Manganese-54	28.83	26.9	18.8 - 35.0	Acceptable
MAPEP-10-MaW22	3rd / 2010	Water	Bq/L	Nickel-63	57.7	59.9	41.9 - 77.9	Acceptable
MAPEP-10-MaW22	3rd / 2010	Water	Bq/L	Plutonium-238	1.213	1.93	1.35 - 2.51	Not Acceptable
MAPEP-10-MaW22	3rd / 2010	Water	Bq/L	Plutonium-239/240	0.026	0.009	-----	Acceptable
MAPEP-10-MaW22	3rd / 2010	Water	Bq/L	Strontium-90	-0.01	0.00	-----	Acceptable
MAPEP-10-MaW22	3rd / 2010	Water	Bq/L	Technetium-99	-0.4	0.00	-----	Acceptable
MAPEP-10-MaW22	3rd / 2010	Water	Bq/L	Tritium	107	90.8	63.6 - 118.0	Acceptable
MAPEP-10-MaW22	3rd / 2010	Water	Bq/L	Uranium-234/233	1.163	1.22	0.85 - 1.59	Acceptable
MAPEP-10-MaW22	3rd / 2010	Water	Bq/L	Uranium-238	1.223	1.25	0.88 - 1.63	Acceptable
MAPEP-10-MaW22	3rd / 2010	Water	Bq/L	Zinc-65	45.9	40.7	28.5 - 52.9	Acceptable
E7195-278	4th / 2010	Milk	pCi/L	Cerium-141	1.39E+02	1.30E+02	1.07	Acceptable
E7195-278	4th / 2010	Milk	pCi/L	Cesium-134	9.85E+01	9.30E+01	1.06	Acceptable
E7196-278	4th / 2010	Water	pCi/L	Cesium-134	1.22E+02	1.18E+02	1.03	Acceptable
E7195-278	4th / 2010	Milk	pCi/L	Cesium-137	9.87E+01	9.45E+01	1.04	Acceptable
E7196-278	4th / 2010	Water	pCi/L	Cesium-137	1.24E+02	1.20E+02	1.03	Acceptable
E7195-278	4th / 2010	Milk	pCi/L	Cobalt-58	7.02E+01	7.37E+01	0.95	Acceptable
E7196-278	4th / 2010	Water	pCi/L	Cobalt-58	9.63E+01	9.35E+01	1.03	Acceptable
E7195-278	4th / 2010	Milk	pCi/L	Cobalt-60	1.77E+02	1.71E+02	1.04	Acceptable
E7196-278	4th / 2010	Water	pCi/L	Cobalt-60	2.34E+02	2.17E+02	1.08	Acceptable
E7195-278	4th / 2010	Milk	pCi/L	Cr-51	2.48E+02	2.34E+02	1.06	Acceptable
E7196-278	4th / 2010	Water	pCi/L	Cr-51	3.12E+02	2.97E+02	1.05	Acceptable
E7193-278	4th / 2010	Cartridge	pCi	Iodine-131	5.97E+01	6.02E+01	0.99	Acceptable
E7195-278	4th / 2010	Milk	pCi/L	Iodine-131	1.01E+02	9.41E+02	1.07	Acceptable
E7196-278	4th / 2010	Water	pCi/L	Iodine-131	7.24E+01	6.44E+01	1.12	Acceptable
E7195-278	4th / 2010	Milk	pCi/L	Iron-59	1.02E+02	9.11E+01	1.12	Acceptable
E7196-278	4th / 2010	Water	pCi/L	Iron-59	1.42E+02	1.16E+02	1.23	Acceptable
E7195-278	4th / 2010	Milk	pCi/L	Manganese-54	1.20E+02	1.19E+02	1.01	Acceptable
E7196-278	4th / 2010	Water	pCi/L	Manganese-54	1.70E+02	1.52E+02	1.12	Acceptable
E7194-278	4th / 2010	Milk	pCi/L	Strontium-89	7.62E+01	9.28E+01	0.82	Acceptable
E7194-278	4th / 2010	Milk	pCi/L	Strontium-90	1.30E+01	1.47E+01	0.88	Acceptable
E7195-278	4th / 2010	Milk	pCi/L	Zinc-65	2.37E+02	2.04E+02	1.16	Acceptable
E7196-278	4th / 2010	Water	pCi/L	Zinc-65	2.97E+02	2.59E+02	1.15	Acceptable
NY-337 3762	4th / 2010	Water	pCi/L	Barium-133	50.5	50.9	43.3 - 59.4	Acceptable

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
NY-337 3762	4th / 2010	Water	pCi/L	Cesium-134	51.0	42.0	35.8 - 49.2	Not Acceptable
NY-337 3762	4th / 2010	Water	pCi/L	Cesium-137	29.3	27.3	22.4 - 32.1	Acceptable
NY-337 3762	4th / 2010	Water	pCi/L	Cobalt-60	13.6	13.2	9.72 - 16.7	Acceptable
NY-337 3763	4th / 2010	Water	pCi/L	Gross Alpha	32.8	41.6	24.3 - 58.9	Acceptable
NY-337 3763	4th / 2010	Water	pCi/L	Gross Beta	29.3	27.5	18.3 - 36.7	Acceptable
NY-337 3764	4th / 2010	Water	pCi/L	Iodine-131	13.4	18.2	14.7 - 21.7	Not Acceptable
NY-337 3764	4th / 2010	Water	pCi/L	Iodine-131	13.5	18.2	14.7 - 21.7	Not Acceptable
NY-337 3765	4th / 2010	Water	pCi/L	Radium-226	13.2	10.6	8.30 - 12.9	Not Acceptable
NY-337 3765	4th / 2010	Water	pCi/L	Radium-228	6.51	6.07	3.91 - 8.22	Acceptable
NY-337 3761	4th / 2010	Water	pCi/L	Strontium-89	47.8	61.3	51.3 - 71.4	Not Acceptable
NY-337 3761	4th / 2010	Water	pCi/L	Strontium-90	12.0	14.9	11.0 - 18.8	Acceptable
NY-337 3766	4th / 2010	Water	pCi/L	Tritium	14400	15300	13500 - 17000	Acceptable
NY-337 3765	4th / 2010	Water	pCi/L	Uranium (activity)	17.5	16.0	13.2 - 18.7	Acceptable
NY-337 3762	4th / 2010	Water	pCi/L	Zinc-65	134	122	104 - 138	Acceptable
100510N	4th / 2010	Water	pCi/L	Strontium-89	49.9	51.4	40.6 - 58.9	Acceptable
100510N	4th / 2010	Water	pCi/L	Strontium-90	35.4	41.3	30.4 - 47.5	Acceptable
RAD - 83	4th / 2010	Water	pCi/L	Strontium-90	41.5	43	31.7 - 49.3	Acceptable
112210H1	4th / 2010	Water	pCi/L	Barium-133	66.3	65.9	54.9 - 72.5	Acceptable
112210H1	4th / 2010	Water	pCi/L	Cesium-134	71.6	71.6	58.4 - 78.8	Acceptable
112210H1	4th / 2010	Water	pCi/L	Cesium-137	151	146	131 - 163	Acceptable
112210H1	4th / 2010	Water	pCi/L	Cobalt-60	90.2	84.5	76.0 - 95.3	Acceptable
112210H1	4th / 2010	Water	pCi/L	Zinc-65	207	186	167 - 219	Acceptable
112210H2	4th / 2010	Water	pCi/L	Plutonium-238	102.0	108	81.7 - 134	Acceptable
112210H2	4th / 2010	Water	pCi/L	Plutonium-239	77.6	86.3	66.8 - 107	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Actinium-228	1460	1830	1170 - 2580	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Americium-241	845	1120	669 - 1440	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Americium-241	928	1120	669 - 1440	Acceptable
MRAD-13	4th / 2010	Vegetation	pCi/kg	Americium-241	4000	4760	2710 - 6540	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Americium-241	70.1	74.1	43.3 - 102	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Americium-241	164	176	120 - 238	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Americium-241	178	176	120 - 238	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Bismuth-212	< 538	2070	543 - 3100	Not Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Bismuth-214	818	983	603 - 1410	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Cesium-134	2230	2240	1440 - 2700	Acceptable
MRAD-13	4th / 2010	Vegetation	pCi/kg	Cesium-134	1200	1040	595 - 1440	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Cesium-134	405	388	253 - 480	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Cesium-134	495	492	363 - 565	Acceptable

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MRAD-13	4th / 2010	Soil	pCi/kg	Cesium-137	3400	3530	2700 - 4580	Acceptable
MRAD-13	4th / 2010	Vegetation	pCi/kg	Cesium-137	1420	1260	924 - 1750	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Cesium-137	532	514	386 - 675	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Cesium-137	620	625	531 - 749	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Cobalt-60	4580	4780	3480 - 6420	Acceptable
MRAD-13	4th / 2010	Vegetation	pCi/kg	Cobalt-60	1130	1010	683 - 1450	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Cobalt-60	531	479	371 - 598	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Cobalt-60	732	714	622 - 844	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Gross Alpha	74.2	52.3	27.1 - 78.7	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Gross Alpha	145	146	64.8 - 216	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Gross Beta	55.6	52.7	32.5 - 77.0	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Gross Beta	171	143	83.6 - 210	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Iron-55	707	626	275 - 974	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Iron-55	1220	825	480 - 1100	Not Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Lead-212	1550	1640	1060 - 2310	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Lead-214	1030	969	580 - 1440	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Manganese-54	< 38.0	0.00	-----	Acceptable
MRAD-13	4th / 2010	Vegetation	pCi/kg	Manganese-54	< 39.8	0.00	-----	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Manganese-54	< 5	0.00	-----	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Plutonium-238	1170	1280	733 - 1800	Acceptable
MRAD-13	4th / 2010	Vegetation	pCi/kg	Plutonium-238	3740	4740	2560 - 6940	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Plutonium-238	70.8	72.9	50.0 - 95.8	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Plutonium-238	157	162	122 - 201	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Plutonium-239	1070	1180	805 - 1570	Acceptable
MRAD-13	4th / 2010	Vegetation	pCi/kg	Plutonium-239	3590	4470	2770 - 6100	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Plutonium-239	65.6	69.6	50.5 - 90.1	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Plutonium-239	136	148	114 - 183	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Potassium-40	10500	10700	7760 - 14500	Acceptable
MRAD-13	4th / 2010	Vegetation	pCi/kg	Potassium-40	29000	22600	16200 - 32000	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Strontium-90	10953	9270	3350 - 15100	Acceptable
MRAD-13	4th / 2010	Vegetation	pCi/kg	Strontium-90	9800	7810	4360 - 10400	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Strontium-90	80.2	159	70.0 - 247	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Strontium-90	817	921	585 - 1230	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Thorium-234	1010	1340	425 - 2550	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Tritium	20900	21600	14100 - 31900	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Uranium-234	899	1360	862 - 1690	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Uranium-234	1190	1360	862 - 1690	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Uranium-234	1110	1360	862 - 1690	Acceptable

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MRAD-13	4th / 2010	Vegetation	pCi/kg	Uranium-234	3600	4010	2750 - 5320	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Uranium-234	73.5	71.8	45.2 - 106	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Uranium-234	69.9	71.8	45.2 - 106	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Uranium-234	106	109	82.2 - 140	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Uranium-234	106	109	82.2 - 140	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Uranium-234	104	109	82.2 - 140	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Uranium-238	1010	1340	819 - 1700	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Uranium-238	1080	1340	819 - 1700	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Uranium-238	903	1340	819 - 1700	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Uranium-238	1090	1340	819 - 1700	Acceptable
MRAD-13	4th / 2010	Vegetation	pCi/kg	Uranium-238	4000	3980	2800 - 5030	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Uranium-238	75.5	71.2	45.6 - 101	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Uranium-238	66.8	71.2	45.6 - 101	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Uranium-238	107	108	82.5 - 134	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Uranium-238	114	108	82.5 - 134	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Uranium-238	108	108	82.5 - 134	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Uranium-Total	2027.4	2770	1580 - 3740	Acceptable
MRAD-13	4th / 2010	Soil	ug/kg	Uranium-Total	2093	2770	1580 - 3740	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Uranium-Total	2253	2770	1580 - 3740	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Uranium-Total	149	146	74.6 - 232	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Uranium-Total	142	146	74.6 - 232	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Uranium-Total	218	221	159 - 294	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Uranium-Total	226.8	221	159 - 294	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Uranium-Total	217	221	159 - 294	Acceptable
MRAD-13	4th / 2010	Soil	ug/kg	Uranium-Total (mass)	3240	4040	2220 - 5080	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Uranium-Total (mass)	2685	4040	2220 - 5080	Acceptable
MRAD-13	4th / 2010	Soil	ug/kg	Uranium-Total (mass)	3241	4040	2220 - 5080	Acceptable
MRAD-13	4th / 2010	Soil	ug/kg	Uranium-Total (mass)	2820	4040	2220 - 5080	Acceptable
MRAD-13	4th / 2010	Vegetation	ug/kg	Uranium-Total (mass)	12000	11900	8180 - 15400	Acceptable
MRAD-13	4th / 2010	Air Filter	ug/Filter	Uranium-Total (mass)	224.5	213	132 - 306	Acceptable
MRAD-13	4th / 2010	Air Filter	ug/Filter	Uranium-Total (mass)	201	213	132 - 306	Acceptable
MRAD-13	4th / 2010	Air Filter	ug/Filter	Uranium-Total (mass)	192	213	132 - 306	Acceptable
MRAD-13	4th / 2010	Water	ug/L	Uranium-Total (mass)	318	323	253 - 399	Acceptable
MRAD-13	4th / 2010	Water	ug/L	Uranium-Total (mass)	342	323	253 - 399	Acceptable
MRAD-13	4th / 2010	Water	ug/L	Uranium-Total (mass)	321	323	253 - 399	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Zinc-65	2420	2300	1820 - 3080	Acceptable

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MRAD-13	4th / 2010	Vegetation	pCi/kg	Zinc-65	1380	1210	874 - 1650	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Zinc-65	552	465	322 - 644	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Zinc-65	557	489	414 - 610	Acceptable
122810P	4th / 2010	Water	pCi/L	Barium-133	70.9	68.9	57.5 - 75.8	Acceptable
122810P	4th / 2010	Water	pCi/L	Cesium-134	43.0	43.2	34.5 - 47.5	Acceptable
122810P	4th / 2010	Water	pCi/L	Cesium-137	122	123	111 - 138	Acceptable
122810P	4th / 2010	Water	pCi/L	Cobalt-60	58.7	53.4	48.1 - 61.3	Acceptable
122810P	4th / 2010	Water	pCi/L	Zinc-65	116	102	91.8 - 122	Acceptable

TABLE 2
2010 ECKERT & ZIEGLER ANALYTICS PERFORMANCE EVALUATION RESULTS SUMMARY

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
E7054-278	2nd / 2010	Milk	pCi/L	Cerium-141	2.61E+02	2.61E+02	1.00	Acceptable
E7055-278	2nd / 2010	Water	pCi/L	Cerium-141	2.78E+02	2.63E+02	1.06	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Cerium-141	2.01E+02	2.02E+02	0.99	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Cerium-141	2.04E+02	2.04E+02	1.00	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Cerium-141	2.01E+02	2.02E+02	0.99	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Cerium-141	2.04E+02	2.04E+02	1.00	Acceptable
E7054-278	2nd / 2010	Milk	pCi/L	Cesium-137	1.61E+02	1.58E+02	1.02	Acceptable
E7055-278	2nd / 2010	Water	pCi/L	Cesium-137	1.71E+02	1.59E+02	1.07	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Cesium-134	2.41E+02	2.53E+02	0.95	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Cesium-134	2.56E+02	2.55E+02	1.00	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Cesium-134	2.41E+02	2.53E+02	0.95	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Cesium-134	2.56E+02	2.55E+02	1.00	Acceptable
E7054-278	2nd / 2010	Milk	pCi/L	Cesium-134	1.76E+02	1.78E+02	0.99	Acceptable
E7055-278	2nd / 2010	Water	pCi/L	Cesium-134	1.85E+02	1.79E+02	1.03	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Cesium-137	1.71E+02	1.79E+02	0.96	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Cesium-137	1.81E+02	1.81E+02	1.00	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Cesium-137	1.71E+02	1.79E+02	0.96	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Cesium-137	1.81E+02	1.81E+02	1.00	Acceptable
E7054-278	2nd / 2010	Milk	pCi/L	Chromium-51	3.81E+02	3.61E+02	1.05	Acceptable
E7055-278	2nd / 2010	Water	pCi/L	Chromium-51	3.86E+02	3.64E+02	1.06	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Chromium-51	5.54E+02	5.48E+02	1.01	Acceptable

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
E6924-278	2nd / 2010	Milk	pCi/L	Chromium-51	5.54E+02	5.48E+02	1.01	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Chromium-51	5.78E+02	5.54E+02	1.04	Acceptable
E7054-278	2nd / 2010	Milk	pCi/L	Cobalt-58	1.45E+02	1.43E+02	1.02	Acceptable
E7055-278	2nd / 2010	Water	pCi/L	Cobalt-58	1.51E+02	1.44E+02	1.05	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Cobalt-58	2.03E+02	2.11E+02	0.96	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Cobalt-58	2.19E+02	2.13E+02	1.03	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Cobalt-58	2.03E+02	2.11E+02	0.96	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Cobalt-58	2.19E+02	2.13E+02	1.03	Acceptable
E7054-278	2nd / 2010	Milk	pCi/L	Cobalt-60	1.90E+02	1.83E+02	1.04	Acceptable
E7055-278	2nd / 2010	Water	pCi/L	Cobalt-60	1.94E+02	1.85E+02	1.05	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Cobalt-60	2.47E+02	2.56E+02	0.97	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Cobalt-60	2.67E+02	2.58E+02	1.03	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Cobalt-60	2.47E+02	2.56E+02	0.97	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Cobalt-60	2.67E+02	2.58E+02	1.03	Acceptable
E7052-278	2nd / 2010	Cartridge	pCi	Iodine-131	8.58E+01	8.54E+01	1.00	Acceptable
E7054-278	2nd / 2010	Milk	pCi/L	Iodine-131	6.91E+01	7.40E+01	0.93	Acceptable
E7055-278	2nd / 2010	Water	pCi/L	Iodine-131	8.12E+01	7.22E+01	1.12	Acceptable
E6922-278	2nd / 2010	Cartridge	pCi	Iodine-131	9.02E+01	9.39E+01	0.96	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Iodine-131	8.25E+01	8.73E+01	0.95	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Iodine-131	1.00E+02	9.61E+01	1.04	Acceptable
E6922-278	2nd / 2010	Cartridge	pCi	Iodine-131	9.02E+01	9.39E+01	0.96	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Iodine-131	8.25E+01	8.73E+01	0.95	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Iodine-131	1.00E+02	9.61E+01	1.04	Acceptable
E7054-278	2nd / 2010	Milk	pCi/L	Iron-59	1.60E+02	1.37E+02	1.17	Acceptable

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
E6924-278	2nd / 2010	Milk	pCi/L	Iron-59	1.88E+02	1.78E+02	1.06	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Iron-59	1.94E+02	1.79E+02	1.08	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Iron-59	1.88E+02	1.78E+02	1.06	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Iron-59	1.94E+02	1.79E+02	1.08	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Manganese-54	1.83E+02	1.78E+02	1.03	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Manganese-54	1.90E+02	1.79E+02	1.06	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Manganese-54	1.83E+02	1.78E+02	1.03	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Manganese-54	1.90E+02	1.79E+02	1.06	Acceptable
E7054-278	2nd / 2010	Milk	pCi/L	Manganese-54	2.10E+02	2.07E+02	1.01	Acceptable
E7055-278	2nd / 2010	Water	pCi/L	Manganese-54	2.30E+02	2.09E+02	1.1	Acceptable
E7053-278	2nd / 2010	Milk	pCi/L	Strontium-89	7.91E+01	9.28E+01	0.85	Acceptable
E6923-278	2nd / 2010	Milk	pCi/L	Strontium-89	9.73E+01	1.31E+02	0.75	Acceptable
E6923-278	2nd / 2010	Milk	pCi/L	Strontium-89	9.73E+01	1.31E+02	0.75	Acceptable
E7053-278	2nd / 2010	Milk	pCi/L	Strontium-90	1.12E+01	1.27E+01	0.88	Acceptable
E6923-278	2nd / 2010	Milk	pCi/L	Strontium-90	1.38E+01	1.79E+01	0.77	Acceptable
E6923-278	2nd / 2010	Milk	pCi/L	Strontium-90	1.38E+01	1.79E+01	0.77	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Zinc-65	3.68E+02	3.45E+02	1.07	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Zinc-65	3.72E+02	3.48E+02	1.07	Acceptable
E6924-278	2nd / 2010	Milk	pCi/L	Zinc-65	3.68E+02	3.45E+02	1.07	Acceptable
E6925-278	2nd / 2010	Water	pCi/L	Zinc-65	3.72E+02	3.48E+02	1.07	Acceptable
E7054-278	2nd / 2010	Milk	pCi/L	Zinc-65	2.71E+02	2.54E+02	1.07	Acceptable
E7055-278	2nd / 2010	Water	pCi/L	Zinc-65	2.97E+02	2.56E+02	1.16	Acceptable
E7119-278	3rd / 2010	Milk	pCi/L	Cerium-141	1.27E+02	1.10E+02	1.15	Acceptable

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
E7119-278	3rd / 2010	Milk	pCi/L	Cesium-137	1.68E+02	1.50E+02	1.12	Acceptable
E7119-278	3rd / 2010	Milk	pCi/L	Chromium-51	3.90E+02	3.39E+02	1.15	Acceptable
E7119-278	3rd / 2010	Milk	pCi/L	Cobalt-58	1.13E+02	1.01E+02	1.12	Acceptable
E7119-278	3rd / 2010	Milk	pCi/L	Cobalt-60	2.14E+02	1.97E+02	1.09	Acceptable
E7117-278	3rd / 2010	Milk	pCi/L	Iodine-131	7.97E+01	8.02E+01	0.99	Acceptable
E7119-278	3rd / 2010	Milk	pCi/L	Iodine-131	1.06E+02	9.69E+01	1.09	Acceptable
E7119-278	3rd / 2010	Milk	pCi/L	Iron-59	1.55E+02	1.19E+02	1.30	Not Acceptable
E7119-278	3rd / 2010	Milk	pCi/L	Manganese-54	1.99E+02	1.69E+02	1.18	Acceptable
E7118-278	3rd / 2010	Milk	pCi/L	Strontium-89	7.95E+01	9.34E+01	0.85	Acceptable
E7118-278	3rd / 2010	Milk	pCi/L	Strontium-90	1.57E+01	1.67E+01	0.94	Acceptable
E7119-278	3rd / 2010	Milk	pCi/L	Zinc-65	2.40E+02	2.06E+02	1.17	Acceptable
E7195-278	4th / 2010	Milk	pCi/L	Cerium-141	1.39E+02	1.30E+02	1.07	Acceptable
E7196-278	4th / 2010	Water	pCi/L	Cerium-141	1.74E+02	1.65E+02	1.05	Acceptable
E7195-278	4th / 2010	Milk	pCi/L	Cesium-134	9.85E+01	9.30E+01	1.06	Acceptable
E7196-278	4th / 2010	Water	pCi/L	Cesium-134	1.22E+02	1.18E+02	1.03	Acceptable
E7195-278	4th / 2010	Milk	pCi/L	Cesium-137	9.87E+01	9.45E+01	1.04	Acceptable
E7196-278	4th / 2010	Water	pCi/L	Cesium-137	1.24E+02	1.20E+02	1.03	Acceptable
E7195-278	4th / 2010	Milk	pCi/L	Chromium-51	2.48E+02	2.34E+02	1.06	Acceptable
E7196-278	4th / 2010	Water	pCi/L	Chromium-51	3.12E+02	2.97E+02	1.05	Acceptable
E7195-278	4th / 2010	Milk	pCi/L	Cobalt-58	7.02E+01	7.37E+01	0.95	Acceptable
E7196-278	4th / 2010	Water	pCi/L	Cobalt-58	9.63E+01	9.35E+01	1.03	Acceptable
E7195-278	4th / 2010	Milk	pCi/L	Cobalt-60	1.77E+02	1.71E+02	1.04	Acceptable
E7196-278	4th / 2010	Water	pCi/L	Cobalt-60	2.34E+02	2.17E+02	1.08	Acceptable
E7193-278	4th / 2010	Cartridge	pCi	Iodine-131	5.97E+01	6.02E+01	0.99	Acceptable
E7195-278	4th / 2010	Milk	pCi/L	Iodine-131	1.01E+02	9.41E+02	1.07	Acceptable
E7196-278	4th / 2010	Water	pCi/L	Iodine-131	7.24E+01	6.44E+01	1.12	Acceptable
E7195-278	4th / 2010	Milk	pCi/L	Iron-59	1.02E+02	9.11E+01	1.12	Acceptable

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
E7195-278	4th / 2010	Milk	pCi/L	Manganese-54	1.20E+02	1.19E+02	1.01	Acceptable
E7196-278	4th / 2010	Water	pCi/L	Manganese-54	1.70E+02	1.52E+02	1.12	Acceptable
E7194-278	4th / 2010	Milk	pCi/L	Strontium-89	7.62E+01	9.28E+01	0.82	Acceptable
E7194-278	4th / 2010	Milk	pCi/L	Strontium-90	1.30E+01	1.47E+01	0.88	Acceptable
E7195-278	4th / 2010	Milk	pCi/L	Zinc-65	2.37E+02	2.04E+02	1.16	Acceptable
E7196-278	4th / 2010	Water	pCi/L	Zinc-65	2.97E+02	2.59E+02	1.15	Acceptable

TABLE 3
2010 DEPARTMENT OF ENERGY MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM
(MAPEP) RESULTS SUMMARY

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Americium-241	0.07	0.00	-----	Acceptable
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Cesium-134	744.67	733	513 - 953	Acceptable
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Cesium-137	831.7	779	545 - 1013	Acceptable
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Cobalt-57	536.0	522	365 - 679	Acceptable
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Cobalt-60	670.3	622	435 - 809	Acceptable
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Iron-55	83.6	0.00	-----	Acceptable
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Manganese-54	940.7	849	594 - 1104	Acceptable
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Nickel-63	489	477	334 - 620	Acceptable
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Plutonium-238	17.9	24	16.9 - 31.3	Acceptable
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Plutonium-239/240	0.21	0.00	-----	Acceptable
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Potassium-40	638.7	559	391 - 727	Acceptable
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Strontium-90	261.0	288	202 - 374	Acceptable
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Technetium-99	-3.0	0.00	-----	Acceptable
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Uranium-234/233	65.27	60	42 -78	Acceptable
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Uranium-238	70.23	64	45 - 83	Acceptable
MAPEP-10-MaS22	3 rd / 2010	Soil	Bq/kg	Zinc-65	-2.89	0.0	-----	Acceptable
MAPEP-10-MaW22	3 rd / 2010	Water	Bq/L	Americium-241	1.0323	1.30	0.91 - 1.69	Acceptable
MAPEP-10-MaW22	3 rd / 2010	Water	Bq/L	Cesium-134	0.027	0.00	-----	Acceptable
MAPEP-10-MaW22	3 rd / 2010	Water	Bq/L	Cesium-137	63.1	60.6	42.4 - 78.8	Acceptable
MAPEP-10-MaW22	3 rd / 2010	Water	Bq/L	Cobalt-57	29.2	28.3	19.8 - 36.8	Acceptable
MAPEP-10-MaW22	3 rd / 2010	Water	Bq/L	Cobalt-60	-0.021	0.00	-----	Acceptable
MAPEP-10-MaW22	3 rd / 2010	Water	Bq/L	Hydrogen-3	107	90.8	63.6 - 118.0	Acceptable
MAPEP-10-MaW22	3 rd / 2010	Water	Bq/L	Iron-55	0.24	0.00	-----	Acceptable
MAPEP-10-MaW22	3 rd / 2010	Water	Bq/L	Manganese-54	28.83	26.9	18.8 - 35.0	Acceptable
MAPEP-10-MaW22	3 rd / 2010	Water	Bq/L	Nickel-63	57.7	59.9	41.9 - 77.9	Acceptable
MAPEP-10-MaW22	3 rd / 2010	Water	Bq/L	Plutonium-238	1.213	1.93	1.35 - 2.51	Not Acceptable
MAPEP-10-MaW22	3 rd / 2010	Water	Bq/L	Plutonium-239/240	0.026	0.009	-----	Acceptable
MAPEP-10-MaW22	3 rd / 2010	Water	Bq/L	Strontium-90	-0.01	0.00	-----	Acceptable
MAPEP-10-MaW22	3 rd / 2010	Water	Bq/L	Technetium-99	-0.4	0.00	-----	Acceptable
MAPEP-10-MaW22	3 rd / 2010	Water	Bq/L	Uranium-234/233	1.163	1.22	0.85 - 1.59	Acceptable
MAPEP-10-MaW22	3 rd / 2010	Water	Bq/L	Uranium-238	1.223	1.25	0.88 - 1.63	Acceptable
MAPEP-10-MaW22	3 rd / 2010	Water	Bq/L	Zinc-65	45.9	40.7	28.5 - 52.9	Acceptable
MAPEP-10-GrW22	3 rd / 2010	Water	Bq/L	Gross Alpha	0.559	0.676	>0.0 - 1.352	Acceptable
MAPEP-10-GrW22	3 rd / 2010	Water	Bq/L	Gross Beta	3.110	3.09	1.55 - 4.64	Acceptable

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MAPEP-10-RdF22	3rd / 2010	Filter	ug/sample	Uranium-238	10.2	5.7	4.0 - 7.4	Not Acceptable
MAPEP-10-RdF22	3rd / 2010	Filter	ug/sample	Uranium-Total	10.2	5.7	4.0 - 7.4	Not Acceptable
MAPEP-10-RdF22	3rd / 2010	Filter	Bq/sample	Americium-241	0.2637	0.146	0.102 - 0.190	Not Acceptable
MAPEP-10-RdF22	3rd / 2010	Filter	Bq/sample	Cesium-134	4.323	2.13	1.49 - 2.77	Not Acceptable
MAPEP-10-RdF22	3rd / 2010	Filter	Bq/sample	Cesium-137	3.070	1.53	1.07 - 1.99	Not Acceptable
MAPEP-10-RdF22	3rd / 2010	Filter	Bq/sample	Cobalt-57	0.0002	0.00	-----	Acceptable
MAPEP-10-RdF22	3rd / 2010	Filter	Bq/sample	Cobalt-60	5.187	2.473	1.731 - 3.215	Not Acceptable
MAPEP-10-RdF22	3rd / 2010	Filter	Bq/sample	Manganese-54	6.483	3.02	2.11 - 3.93	Not Acceptable
MAPEP-10-RdF22	3rd / 2010	Filter	Bq/sample	Plutonium-238	0.010	0.0010	-----	Acceptable
MAPEP-10-RdF22	3rd / 2010	Filter	Bq/sample	Plutonium-239/240	0.164	0.0832	0.0582 - 0.1082	Not Acceptable
MAPEP-10-RdF22	3rd / 2010	Filter	Bq/sample	Strontium-90	-0.004	0.00	-----	Acceptable
MAPEP-10-RdF22	3rd / 2010	Filter	Bq/sample	Uranium-234/233	0.137	0.068	0.048 - 0.088	Not Acceptable
MAPEP-10-RdF22	3rd / 2010	Filter	Bq/sample	Uranium-238	0.147	0.071	0.050 - 0.092	Not Acceptable
MAPEP-10-RdF22	3rd / 2010	Filter	Bq/sample	Zinc-65	-0.106	0.00	-----	Acceptable
MAPEP-10-GrF22	3rd / 2010	Filter	Bq/sample	Gross Alpha	0.303	0.427	>0.0 - 0.854	Acceptable
MAPEP-10-GrF22	3rd / 2010	Filter	Bq/sample	Gross Beta	1.433	1.29	0.65 - 1.94	Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	ug/sample	Uranium-235	0.090	0.1250	0.0875 - 0.1625	Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	ug/sample	Uranium-238	12.5	17.9	12.5 - 23.3	Not Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	ug/sample	Uranium-Total	13.9	18.0	12.6 - 23.4	Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	Bq/sample	Americium-241	0.179	0.225	0.158 - 0.293	Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	Bq/sample	Cesium-134	3.098	4.39	3.07 - 5.71	Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	Bq/sample	Cesium-137	2.185	3.06	2.14 - 3.98	Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	Bq/sample	Cobalt-57	0.009	0.00	-----	Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	Bq/sample	Cobalt-60	3.076	3.27	2.29 - 4.25	Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	Bq/sample	Manganese-54	0.004	0.00	-----	Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	Bq/sample	Plutonium-238	0.149	0.160	0.112 - 0.208	Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	Bq/sample	Plutonium-239/240	0.0026	0.0008	-----	Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	Bq/sample	Strontium-90	0.033	0.00	-----	Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	Bq/sample	Uranium-234/233	0.184	0.216	0.151 - 0.281	Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	Bq/sample	Uranium-238	0.184	0.223	0.156 - 0.290	Acceptable
MAPEP-10-RdV22	3rd / 2010	Vegetation	Bq/sample	Zinc-65	6.844	7.10	4.97 - 9.23	Acceptable

TABLE 4
2010 ERA PROGRAM PERFORMANCE EVALUATION RESULTS SUMMARY

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
RAD - 80	1st / 2010	Water	pCi/L	Barium-133	73.5	72.9	61.0 - 80.2	Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Cesium-134	69.2	63.4	51.5 - 69.7	Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Cesium-137	118.0	120	108 - 134	Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Cobalt-60	87.7	90	81 - 101	Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Zinc-65	213.0	210	189 - 246	Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Gross Alpha	51.3	42.5	22.0 - 53.9	Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Gross Beta	52.0	54.2	37.0 - 61.1	Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Radium-226	16.9	17.8	13.2 - 20.3	Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Radium-228	20.4	18.2	12.3 - 21.8	Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Uranium (Nat)	49.0	50.2	40.7 - 55.8	Acceptable
RAD - 80	1st / 2010	Water	ug/L	Uranium (Nat) Mass	67.3	73.2	59.4 - 81.4	Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Tritium	19200	18700	16400-20600	Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Strontium-89	37.9	53.3	42.3 - 60.9	Not Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Strontium-90	52.3	42.2	31.1 - 48.4	Not Acceptable
RAD - 80	1st / 2010	Water	pCi/L	Iodine-131	30.5	28.2	23.5 - 33.1	Acceptable
RAD - 82	3rd / 2010	Water	pCi/L	Barium-133	112.0	89.1	75.0 - 98.0	Not Acceptable
RAD - 82	3rd / 2010	Water	pCi/L	Cesium-134	115.0	88.3	72.4 -97.1	Not Acceptable
RAD - 82	3rd / 2010	Water	pCi/L	Cesium-137	271	210	189 - 232	Not Acceptable
RAD - 82	3rd / 2010	Water	pCi/L	Cobalt-60	98.4	72.8	65.5 - 82.5	Not Acceptable
RAD - 82	3rd / 2010	Water	pCi/L	Zinc-65	161	110	99.0 - 131	Not Acceptable
RAD - 82	3rd / 2010	Water	pCi/L	Gross Alpha	65.5	61.1	32.0 - 75.9	Acceptable
RAD - 82	3rd / 2010	Water	pCi/L	Gross Beta	56.7	56.4	38.6 - 63.6	Acceptable
RAD - 82	3rd / 2010	Water	pCi/L	Radium-226	15.9	17.1	12.7 - 19.6	Acceptable
RAD - 82	3rd / 2010	Water	pCi/L	Radium-228	18.9	16.1	10.8 - 19.4	Acceptable
RAD - 82	3rd / 2010	Water	pCi/L	Uranium (Nat)	58.0	49.6	40.2 - 55.1	Not Acceptable
RAD - 82	3rd / 2010	Water	ug/L	Uranium (Nat) Mass	89.1	72.3	58.7 - 80.4	Not Acceptable
RAD - 82	3rd / 2010	Water	pCi/L	Tritium	18500	19800	17300 - 21700	Acceptable
RAD - 82	3rd / 2010	Water	pCi/L	Strontium-89	60.6	55.3	44.1 - 62.9	Acceptable
RAD - 82	3rd / 2010	Water	pCi/L	Strontium-90	47.1	32.8	24.0 - 38.0	Not Acceptable
RAD - 82	3rd / 2010	Water	pCi/L	Iodine-131	32.2	28.4	23.6 - 33.3	Acceptable
090710N	3rd / 2010	Water	pCi/L	Barium-133	86.9	92.9	78.3 - 102	Acceptable
090710N	3rd / 2010	Water	pCi/L	Cesium-134	93.8	79.4	65.0 - 87.3	Not Acceptable
090710N	3rd / 2010	Water	pCi/L	Cesium-137	55.5	54.6	49.1 - 62.9	Acceptable
090710N	3rd / 2010	Water	pCi/L	Cobalt-60	120.0	117	105 - 131	Acceptable
090710N	3rd / 2010	Water	pCi/L	Zinc-65	129	99.5	89.6 - 119	Not Acceptable

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
090710N	3rd / 2010	Water	ug/L	Uranium (Nat) Mass	48.6	49.3	39.8 - 55.1	Acceptable
RAD - 83	4th / 2010	Water	pCi/L	Strontium-89	65.3	68.5	55.8 - 76.7	Acceptable
RAD - 83	4th / 2010	Water	pCi/L	Strontium-90	41.5	43	31.7 - 49.3	Acceptable
100510N	4th / 2010	Water	pCi/L	Strontium-89	49.9	51.4	40.6 - 58.9	Acceptable
100510N	4th / 2010	Water	pCi/L	Strontium-90	35.4	41.3	30.4 - 47.5	Acceptable
112210H1	4th / 2010	Water	pCi/L	Barium-133	66.3	65.9	54.9 - 72.5	Acceptable
112210H1	4th / 2010	Water	pCi/L	Cesium-134	71.6	71.6	58.4 - 78.8	Acceptable
112210H1	4th / 2010	Water	pCi/L	Cesium-137	151	146	131 - 163	Acceptable
112210H1	4th / 2010	Water	pCi/L	Cobalt-60	90.2	84.5	76.0 - 95.3	Acceptable
112210H1	4th / 2010	Water	pCi/L	Zinc-65	207	186	167 - 219	Acceptable
112210H2	4th / 2010	Water	pCi/L	Plutonium-238	102.0	108	81.7 - 134	Acceptable
112210H2	4th / 2010	Water	pCi/L	Plutonium-239	77.6	86.3	66.8 - 107	Acceptable
122810P	4th / 2010	Water	pCi/L	Barium-133	70.9	68.9	57.5 - 75.8	Acceptable
122810P	4th / 2010	Water	pCi/L	Cesium-134	43.0	43.2	34.5 - 47.5	Acceptable
122810P	4th / 2010	Water	pCi/L	Cesium-137	122	123	111 - 138	Acceptable
122810P	4th / 2010	Water	pCi/L	Cobalt-60	58.7	53.4	48.1 - 61.3	Acceptable
122810P	4th / 2010	Water	pCi/L	Zinc-65	116	102	91.8 - 122	Acceptable

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TABLE 5
2010 ERA PROGRAM (MRAD) PERFORMANCE EVALUATION RESULTS SUMMARY

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MRAD-12	2nd / 2010	Soil	pCi/kg	Actinium-228	1570	1850	1190 - 2600	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Americium-241	1130	1500	896 - 1930	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Bismuth-212	1430	1640	430 - 2450	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Bismuth-214	1080	1410	865 - 2030	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Cesium-134	3040	3110	2000 - 3740	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Cesium-137	4330	4440	3400 - 5770	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Cobalt-60	2120	2140	1560 - 2870	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Lead-212	1540	1520	980 - 2140	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Lead-214	1300	1440	862 - 2140	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Manganese-54	< 22.9	0	-----	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Potassium-40	11100	10900	7900 - 14800	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Thorium-234	1600	1610	511 - 3070	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Uranium-238	1600	1610	984 - 2040	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Zinc-65	2790	2470	1960 - 3310	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Strontium-90	7870	8180	2960 - 13300	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Uranium-234	< 1158	1620	1030 - 2010	Not Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Uranium-238	908	1610	984 - 2040	Not Acceptable
MRAD-12	2nd / 2010	Soil	ug/kg	Uranium-Total (mass)	2920	4820	2650 - 6060	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Strontium-90	7870	8180	2960 - 13300	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Americium-241	1120	1500	896 - 1930	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Plutonium-238	1360	1330	761 - 1870	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Plutonium-239	1220	1260	860 - 1670	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Uranium-234	1230	1620	1030 - 2010	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Uranium-238	1440	1610	984 - 2040	Acceptable
MRAD-12	2nd / 2010	Soil	pCi/kg	Uranium-Total	2789	3300	1880 - 4460	Acceptable
MRAD-12	2nd / 2010	Soil	ug/kg	Uranium-Total (mass)	4350	4820	2650 - 6060	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Uranium-238	1604	1710	1200 - 2160	Acceptable
MRAD-12	2nd / 2010	Vegetation	ug/kg	Uranium-Total (mass)	5270	5120	3520 - 6610	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Americium-241	2410	3140	1790 - 4310	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Curium-244	429	528	260 - 822	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Plutonium-238	3090	3040	1640 - 4450	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Plutonium-239	2830	2800	1740 - 3820	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Uranium-234	1680	1720	1180 - 2280	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Uranium-238	1770	1710	1200 - 2160	Acceptable

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Uranium-Total (mass)	5290	5120	3520 - 6610	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Americium-241	3600	3140	1790 - 4310	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Cesium-134	1750	1670	956 - 2310	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Cesium-137	1550	1470	1080 - 2040	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Cobalt-60	2100	1970	1330 - 2830	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Manganese-54	< 9.6	0.00	-----	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Potassium-40	40800	34900	25100 - 49400	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Uranium-238	< 1240	1710	1200 - 2160	Not Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Zinc-65	1630	1360	983 - 1860	Acceptable
MRAD-12	2nd / 2010	Vegetation	pCi/kg	Strontium-90	7880	9120	5100 - 12100	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Uranium-238	61.5	61.5	39.4 - 87.3	Acceptable
MRAD-12	2nd / 2010	Air Filter	ug/Filter	Uranium-Total (mass)	183	184	114 - 264	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Americium-241	52.7	60.0	35.1 - 82.3	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Plutonium-238	63.9	64.1	44.0 - 84.3	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Plutonium-239	56.6	56.7	41.1 - 73.4	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Uranium-234	68.8	62.1	39.1 - 92.0	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Uranium-238	69.5	61.5	39.4 - 87.3	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Uranium-Total	141	126	64.4 - 200	Acceptable
MRAD-12	2nd / 2010	Air Filter	ug/Filter	Uranium-Total (mass)	208	184	114 - 264	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Americium-241	76	60	35.1 - 82.3	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Cesium-134	504	436	284 - 540	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Cesium-137	785	701	527 - 921	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Cobalt-60	591	523	405 - 653	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Manganese-54	< 5.07	0.00	-----	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Uranium-238	< 61.2	61.5	39.4 - 87.3	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Zinc-65	462	389	269 - 539	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Strontium-90	178	187	82.3 - 291	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Iron-55	375	359	158 - 559	Acceptable
MRAD-12	2nd / 2010	Air Filter	ug/Filter	Uranium-Total (mass)	175	184	114 - 264	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Gross Alpha	68.2	79.6	41.3 - 120	Acceptable
MRAD-12	2nd / 2010	Air Filter	pCi/Filter	Gross Beta	72	70.4	43.4 - 103	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Uranium-238	67.9	60.9	46.5 - 75.5	Acceptable
MRAD-12	2nd / 2010	Water	ug/L	Uranium-Total (mass)	213	182	143 - 225	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Americium-241	79.1	95.6	65.5 - 129	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Plutonium-238	79.5	109	82.4 - 135	Not Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Plutonium-239	103	105	81.2 - 130	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Uranium-234	62.4	61.4	46.3 - 79.2	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Uranium-238	66.1	60.9	46.5 - 75.5	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Uranium-Total	131.5	125	90.0 - 166	Acceptable

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Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MRAD-12	2nd / 2010	Water	pCi/L	Americium-241	123	95.6	65.5 - 129	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Cesium-134	454	417	308 - 479	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Cesium-137	693	654	556 - 783	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Cobalt-60	813	727	633 - 859	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Manganese-54	< 7.7	0.00	-----	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Uranium-238	< 155	60.9	46.5 - 75.5	Not Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Zinc-65	632	533	452 - 664	Acceptable
MRAD-12	2nd / 2010	Water	pCi/L	Strontium-90	708	719	456 - 961	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Actinium-228	1460	1830	1170 - 2580	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Americium-241	845	1120	669 - 1440	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Bismuth-212	< 538	2070	543 - 3100	Not Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Bismuth-214	818	983	603 - 1410	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Cesium-134	2230	2240	1440 - 2700	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Cesium-137	3400	3530	2700 - 4580	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Cobalt-60	4580	4780	3480 - 6420	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Lead-212	1550	1640	1060 - 2310	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Lead-214	1030	969	580 - 1440	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Manganese-54	< 38.0	0.00	-----	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Potassium-40	10500	10700	7760 - 14500	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Thorium-234	1010	1340	425 - 2550	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Uranium-238	1010	1340	819 - 1700	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Zinc-65	2420	2300	1820 - 3080	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Americium-241	928	1120	669 - 1440	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Plutonium-238	1170	1280	733 - 1800	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Plutonium-239	1070	1180	805 - 1570	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Uranium-234	899	1360	862 - 1690	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Uranium-238	1080	1340	819 - 1700	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Uranium-Total	2027.4	2770	1580 - 3740	Acceptable
MRAD-13	4th / 2010	Soil	ug/kg	Uranium-Total (mass)	3240	4040	2220 - 5080	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Uranium-234	1190	1360	862 - 1690	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Uranium-238	903	1340	819 - 1700	Acceptable
MRAD-13	4th / 2010	Soil	ug/kg	Uranium-Total	2093	2770	1580 - 3740	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Uranium-Total (mass)	2685	4040	2220 - 5080	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Uranium-234	1110	1360	862 - 1690	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Uranium-238	1090	1340	819 - 1700	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Uranium-Total	2253	2770	1580 - 3740	Acceptable
MRAD-13	4th / 2010	Soil	ug/kg	Uranium-Total (mass)	3241	4040	2220 - 5080	Acceptable
MRAD-13	4th / 2010	Soil	ug/kg	Uranium-Total (mass)	2820	4040	2220 - 5080	Acceptable
MRAD-13	4th / 2010	Soil	pCi/kg	Strontium-90	10953	9270	3350 - 15100	Acceptable

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MRAD-13	4th / 2010	Vegetation	pCi/kg	Plutonium-238	3740	4740	2560 - 6940	Acceptable
MRAD-13	4th / 2010	Vegetation	pCi/kg	Plutonium-239	3590	4470	2770 - 6100	Acceptable
MRAD-13	4th / 2010	Vegetation	pCi/kg	Uranium-234	3600	4010	2750 - 5320	Acceptable
MRAD-13	4th / 2010	Vegetation	pCi/kg	Uranium-238	4000	3980	2800 - 5030	Acceptable
MRAD-13	4th / 2010	Vegetation	pCi/kg	Uranium-Total	7834	8180	5620 - 10600	Acceptable
MRAD-13	4th / 2010	Vegetation	ug/kg	Uranium-Total (mass)	12000	11900	8180 - 15400	Acceptable
MRAD-13	4th / 2010	Vegetation	pCi/kg	Cesium-134	1200	1040	595 - 1440	Acceptable
MRAD-13	4th / 2010	Vegetation	pCi/kg	Cesium-137	1420	1260	924 - 1750	Acceptable
MRAD-13	4th / 2010	Vegetation	pCi/kg	Cobalt-60	1130	1010	683 - 1450	Acceptable
MRAD-13	4th / 2010	Vegetation	pCi/kg	Manganese-54	< 39.8	0.00	-----	Acceptable
MRAD-13	4th / 2010	Vegetation	pCi/kg	Potassium-40	29000	22600	16200 - 32000	Acceptable
MRAD-13	4th / 2010	Vegetation	pCi/kg	Zinc-65	1380	1210	874 - 1650	Acceptable
MRAD-13	4th / 2010	Vegetation	pCi/kg	Strontium-90	9800	7810	4360 - 10400	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Uranium-234	73.5	71.8	45.2 - 106	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Uranium-238	75.5	71.2	45.6 - 101	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Uranium-Total	149	146	74.6 - 232	Acceptable
MRAD-13	4th / 2010	Air Filter	ug/Filter	Uranium-Total (mass)	224.5	213	132 - 306	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Americium-241	70.1	74.1	43.3 - 102	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Plutonium-238	70.8	72.9	50.0 - 95.8	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Plutonium-239	65.6	69.6	50.5 - 90.1	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Uranium-234	69.9	71.8	45.2 - 106	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Uranium-238	66.8	71.2	45.6 - 101	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Uranium-Total	142	146	74.6 - 232	Acceptable
MRAD-13	4th / 2010	Air Filter	ug/Filter	Uranium-Total (mass)	201	213	132 - 306	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Cesium-134	405	388	253 - 480	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Cesium-137	532	514	386 - 675	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Cobalt-60	531	479	371 - 598	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Manganese-54	< 3.58	0.00	-----	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Zinc-65	552	465	322 - 644	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Strontium-90	80.2	159	70.0 - 247	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Iron-55	707	626	275 - 974	Acceptable
MRAD-13	4th / 2010	Air Filter	ug/Filter	Uranium-Total (mass)	192	213	132 - 306	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Gross Alpha	74.2	52.3	27.1 - 78.7	Acceptable
MRAD-13	4th / 2010	Air Filter	pCi/Filter	Gross Beta	55.6	52.7	32.5 - 77.0	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Uranium-234	106	109	82.2 - 140	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Uranium-238	107	108	82.5 - 134	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Uranium-Total	218	221	159 - 294	Acceptable
MRAD-13	4th / 2010	Water	ug/L	Uranium-Total (mass)	318	323	253 - 399	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Americium-241	164	176	120 - 238	Acceptable

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MRAD-13	4th / 2010	Water	pCi/L	Plutonium-239	136	148	114 - 183	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Uranium-234	106	109	82.2 - 140	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Uranium-238	114	108	82.5 - 134	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Uranium-Total	226.8	221	159 - 294	Acceptable
MRAD-13	4th / 2010	Water	ug/L	Uranium-Total (mass)	342	323	253 - 399	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Americium-241	178	176	120 - 238	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Cesium-134	495	492	363 - 565	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Cesium-137	620	625	531 - 749	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Cobalt-60	732	714	622 - 844	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Manganese-54	< 5	0.00	-----	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Zinc-65	557	489	414 - 610	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Strontium-90	817	921	585 - 1230	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Uranium-234	104	109	82.2 - 140	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Uranium-238	108	108	82.5 - 134	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Uranium-Total	217	221	159 - 294	Acceptable
MRAD-13	4th / 2010	Water	ug/L	Uranium-Total (mass)	321	323	253 - 399	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Iron-55	1220	825	480 - 1100	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Gross Alpha	145	146	64.8 - 216	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Gross Beta	171	143	83.6 - 210	Acceptable
MRAD-13	4th / 2010	Water	pCi/L	Tritium	20900	21600	14100 - 31900	Acceptable

TABLE 6
2010 NEW YORK STATE DEPARTMENT OF HEALTH ENVIRONMENTAL LABORATORY APPROVAL PROGRAM (NYSDOH ELAP) PROFICIENCY TEST RESULTS SUMMARY

Sample Number	Quarter / Year	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
NY-332 3263	2nd / 2010	Water	pCi/L	Gross Alpha	33.0	26.8	15.0 - 38.6	Acceptable
NY-332 3263	2nd / 2010	Water	pCi/L	Gross Beta	64.6	54.0	41.3 - 66.7	Acceptable
NY-332 3262	2nd / 2010	Water	pCi/L	Cesium-134	14.8	14.0	10.7 - 17.3	Acceptable
NY-332 3262	2nd / 2010	Water	pCi/L	Barium-133	27.8	25.6	20.6 - 30.5	Acceptable
NY-332 3262	2nd / 2010	Water	pCi/L	Zinc-65	146	139	121 - 156	Acceptable
NY-332 3262	2nd / 2010	Water	pCi/L	Cobalt-60	98.3	99.5	90.3 - 109	Acceptable
NY-332 3262	2nd / 2010	Water	pCi/L	Cesium-137	124	123	112 - 134	Acceptable
NY-332 3264	2nd / 2010	Water	pCi/L	Iodine-131	23.4	26.4	21.9 - 31.0	Acceptable
NY-332 3264	2nd / 2010	Water	pCi/L	Iodine-131	26.8	26.4	21.9 - 31.0	Acceptable
NY-332 3261	2nd / 2010	Water	pCi/L	Strontium-89	46.7	41.9	33.4 - 50.4	Acceptable
NY-332 3261	2nd / 2010	Water	pCi/L	Strontium-90	33.9	34.8	27.1 - 42.5	Acceptable
NY-332 3266	2nd / 2010	Water	pCi/L	Tritium	9610	9490	8390 - 10600	Acceptable
NY-332 3265	2nd / 2010	Water	pCi/L	Radium-226	12.1	13.2	10.4 - 16.0	Acceptable
NY-332 3265	2nd / 2010	Water	pCi/L	Radium-228	9.90	8.91	6.08 - 11.7	Acceptable
NY-332 3265	2nd / 2010	Water	pCi/L	Uranium (activity)	48.81	44.7	37.9 - 51.4	Acceptable
NY-337 3763	4th / 2010	Water	pCi/L	Gross Alpha	32.8	41.6	24.3 - 58.9	Acceptable
NY-337 3763	4th / 2010	Water	pCi/L	Gross Beta	29.3	27.5	18.3 - 36.7	Acceptable
NY-337 3762	4th / 2010	Water	pCi/L	Cesium-134	51.0	42.0	35.8 - 49.2	Not Acceptable
NY-337 3762	4th / 2010	Water	pCi/L	Cesium-137	29.3	27.3	22.4 - 32.1	Acceptable
NY-337 3762	4th / 2010	Water	pCi/L	Cobalt-60	13.6	13.2	9.72 - 16.7	Acceptable
NY-337 3762	4th / 2010	Water	pCi/L	Zinc-65	134	122	104 - 138	Acceptable
NY-337 3762	4th / 2010	Water	pCi/L	Barium-133	50.5	50.9	43.3 - 59.4	Acceptable
NY-337 3764	4th / 2010	Water	pCi/L	Iodine-131	13.4	18.2	14.7 - 21.7	Not Acceptable
NY-337 3764	4th / 2010	Water	pCi/L	Iodine-131	13.5	18.2	14.7 - 21.7	Not Acceptable
NY-337 3761	4th / 2010	Water	pCi/L	Strontium-89	47.8	61.3	51.3 - 71.4	Not Acceptable
NY-337 3761	4th / 2010	Water	pCi/L	Strontium-90	12.0	14.9	11.0 - 18.8	Acceptable
NY-337 3766	4th / 2010	Water	pCi/L	Tritium	14400	15300	13500 - 17000	Acceptable
NY-337 3765	4th / 2010	Water	pCi/L	Radium-226	13.2	10.6	8.30 - 12.9	Not Acceptable
NY-337 3765	4th / 2010	Water	pCi/L	Radium-228	6.51	6.07	3.91 - 8.22	Acceptable
NY-337 3765	4th / 2010	Water	pCi/L	Uranium (activity)	17.5	16.0	13.2 - 18.7	Acceptable

FIGURE 1
COBALT-60 PERFORMANCE EVALUATION RESULTS AND % BIAS

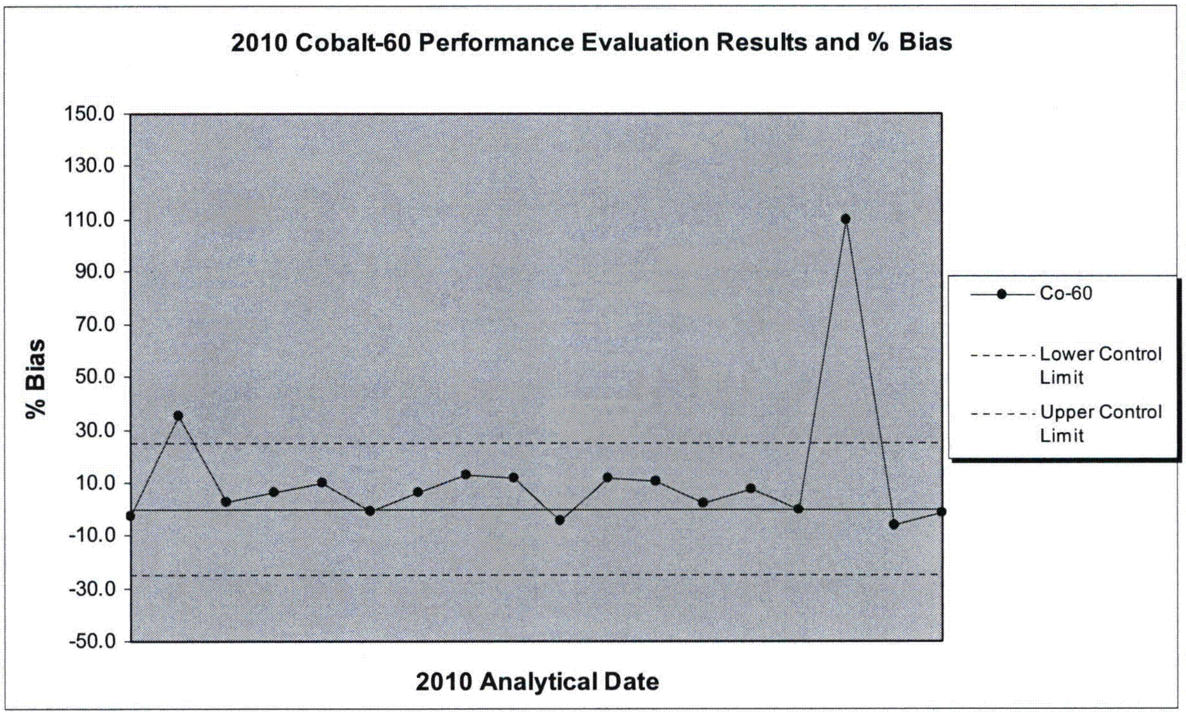


FIGURE 2
CESIUM-137 PERFORMANCE EVALUATION RESULTS AND % BIAS

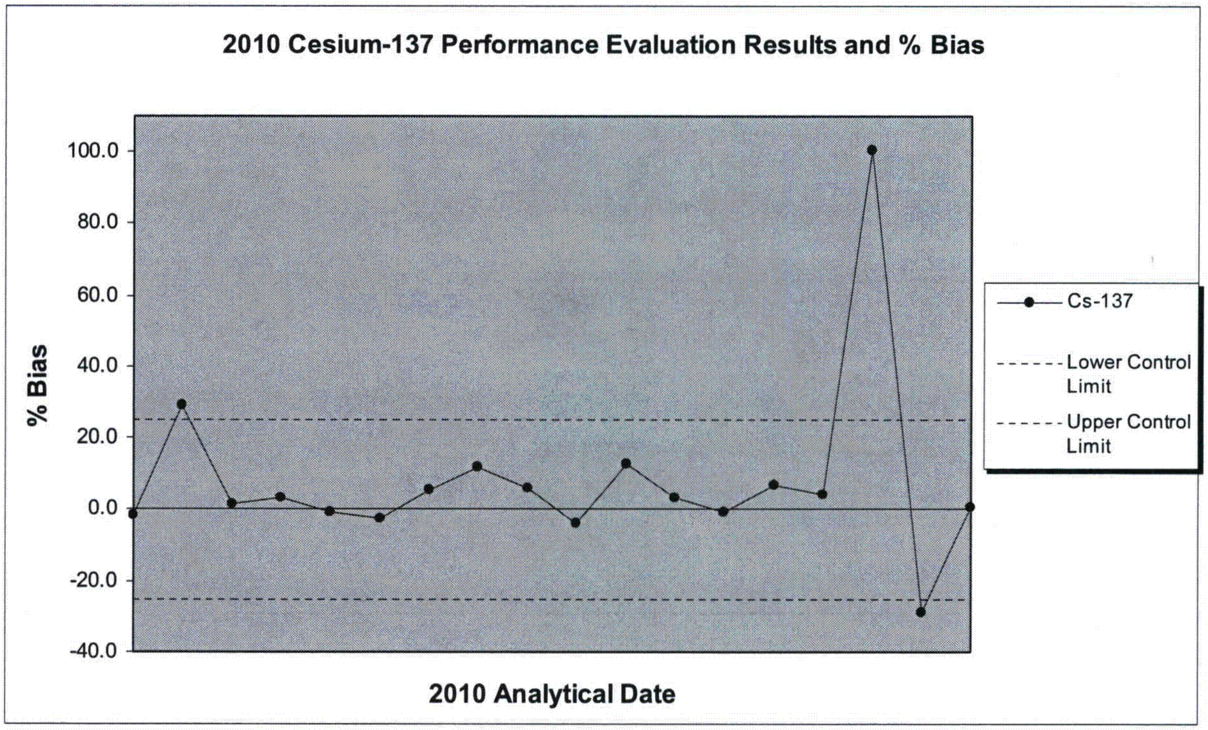


FIGURE 3
TRITIUM PERFORMANCE EVALUATION RESULTS AND % BIAS

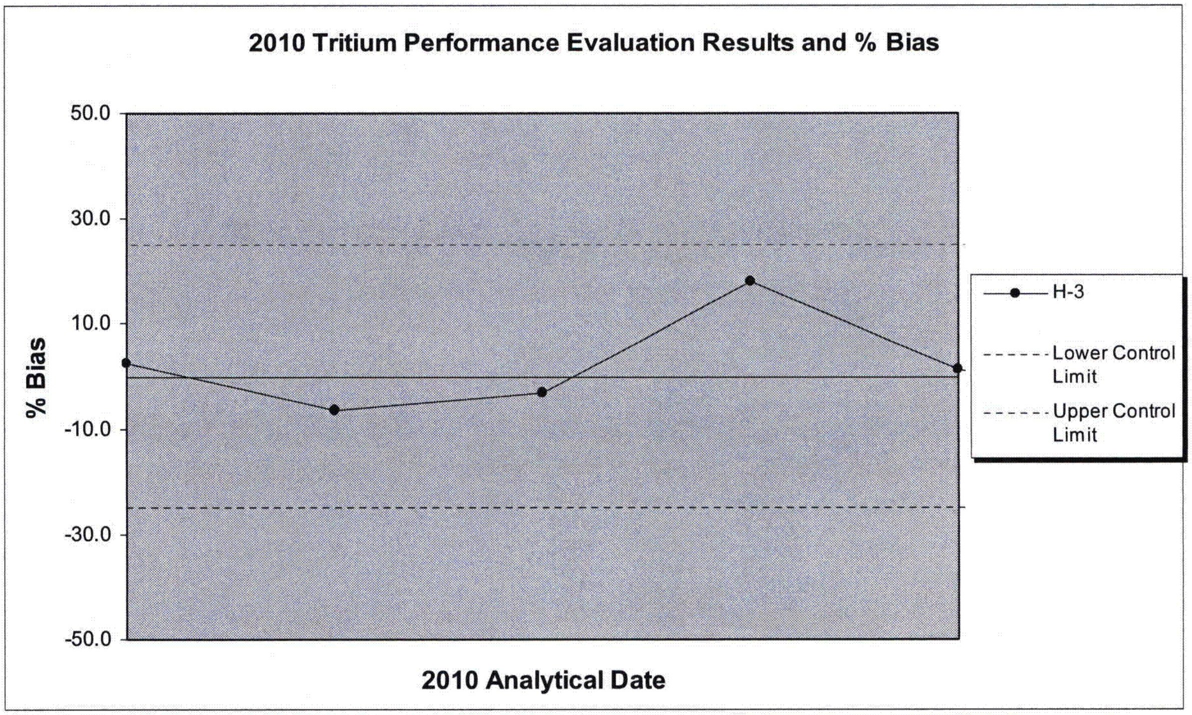


FIGURE 4
STRONTIUM-90 PERFORMANCE EVALUATION RESULTS AND % BIAS

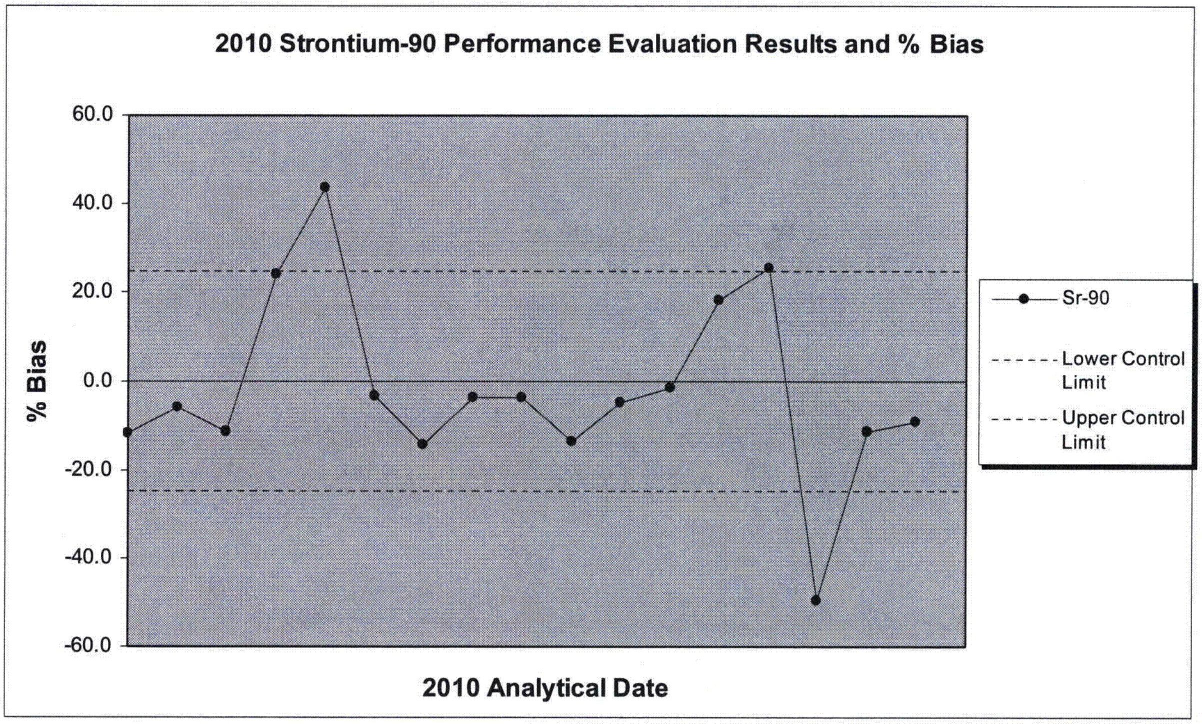


FIGURE 5
GROSS ALPHA PERFORMANCE EVALUATION RESULTS AND % BIAS

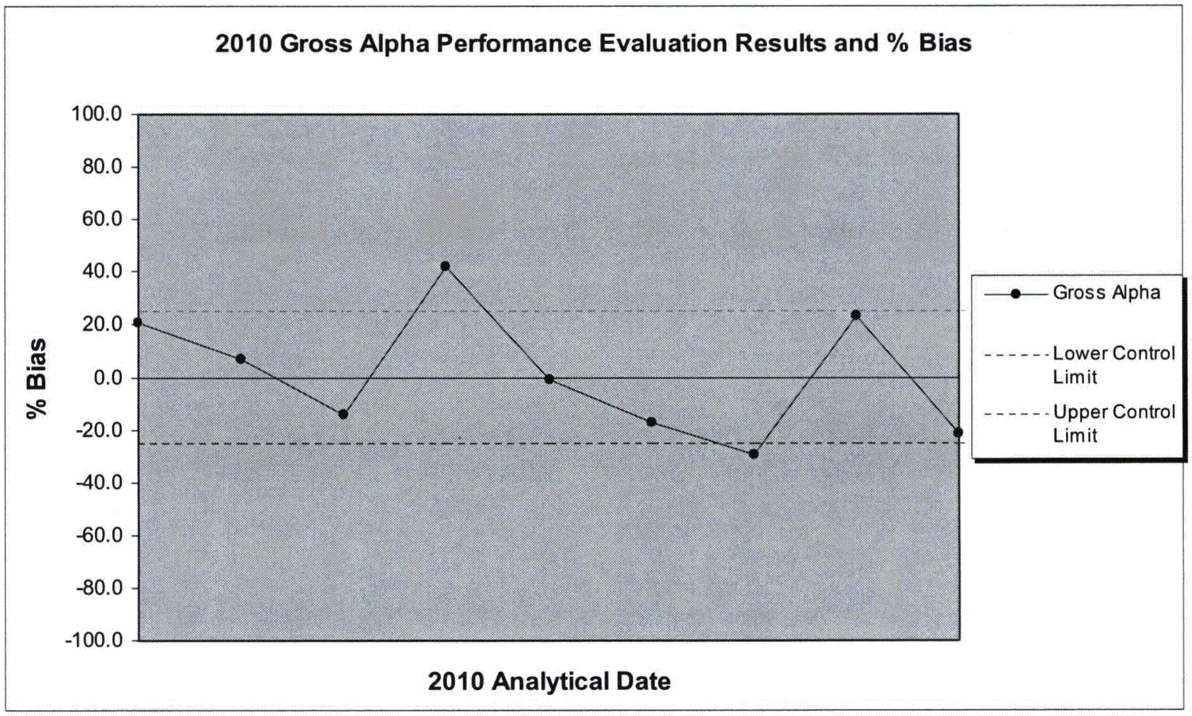


FIGURE 6
GROSS BETA PERFORMANCE EVALUATION RESULTS AND % BIAS

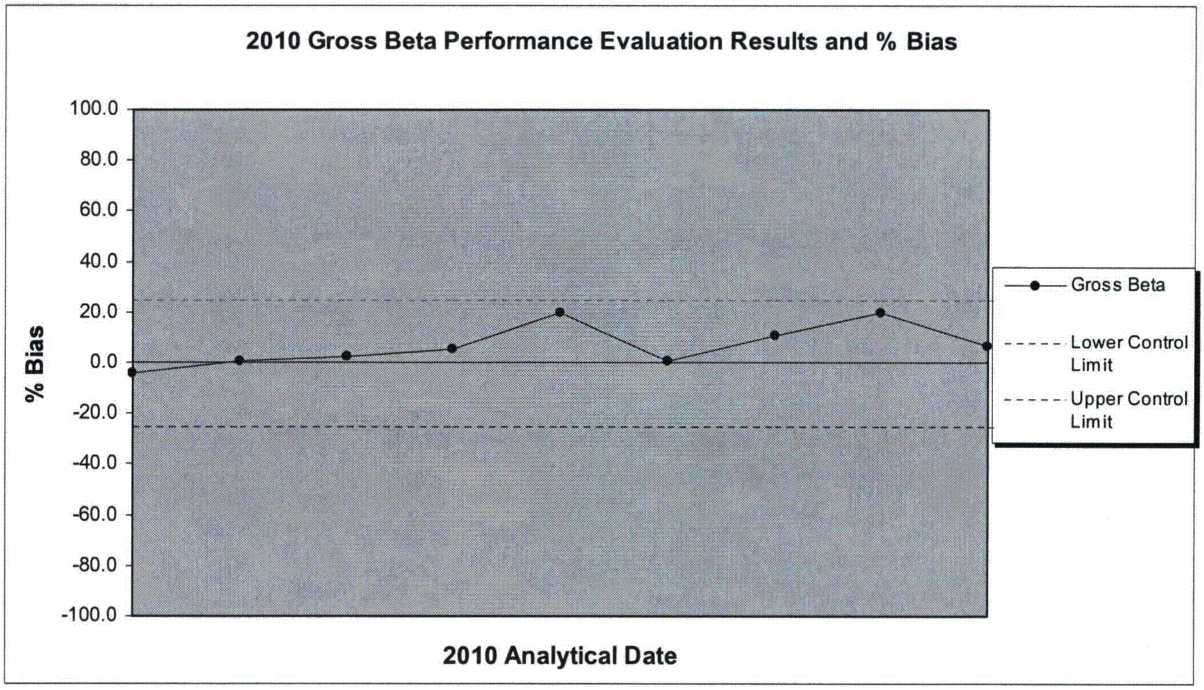


FIGURE 7
IODINE-131 PERFORMANCE EVALUATION RESULTS AND % BIAS

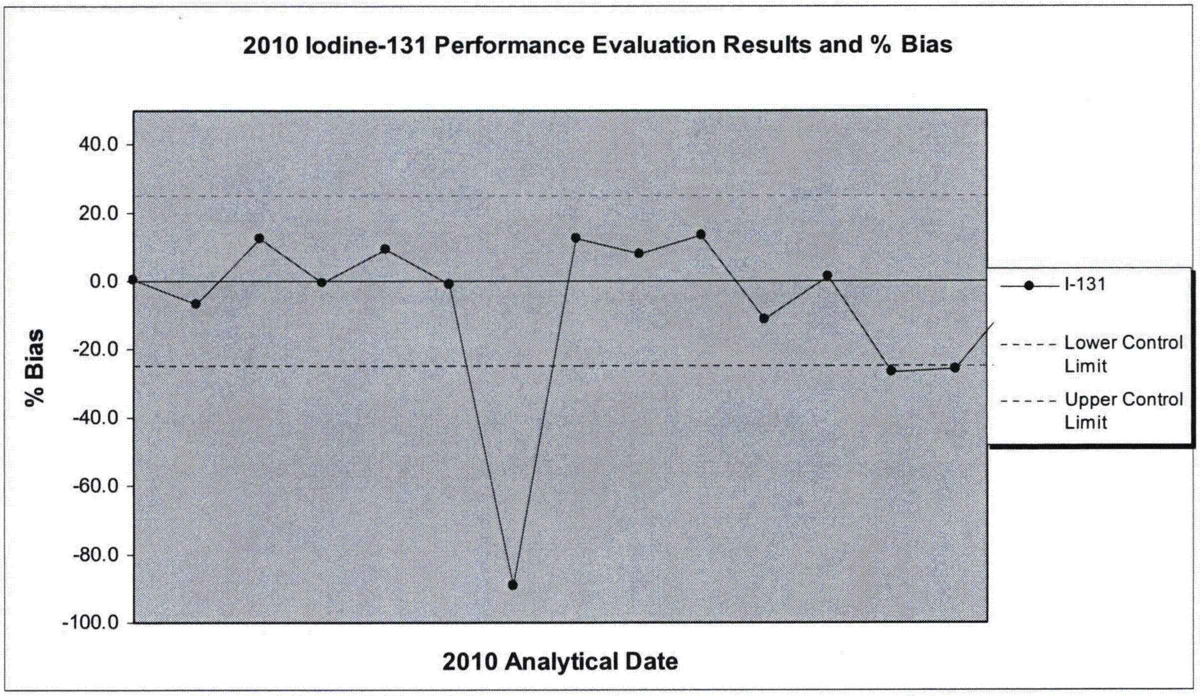


TABLE 7
GEL 2010 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM (REMP)
INTRA-LABORATORY DATA SUMMARY: BIAS AND PRECISION BY MATRIX

2010	Bias Criteria (+/- 25%) Laboratory Control Sample (LCS)		Precision Criteria (% RPD[1]) Duplicate (DUP or LCSD)	
	WITHIN CRITERIA	OUTSIDE CRITERIA	WITHIN CRITERIA	OUTSIDE CRITERIA
Air Particulate				
Gross Alpha/Beta	325	0	326	0
Americium-241	16	0	16	0
Iodine-131	247	0	249	0
Gamma	23	0	23	0
Strontium-90	15	0	15	0
Air Cartridge				
Iodine-131	11	0	11	0
Milk				
Gamma	63	0	64	0
Iodine-131	61	0	61	0
Strontium-90	33	0	34	0
Solid				
Gamma	27	0	29	0
Carbon-14	2	0	2	0
Iron-55	3	0	3	0
Nickel-63	3	0	3	0
Strontium-90	11	0	11	0
Tissue				
Gamma	38	0	36	0
Strontium-90	3	0	3	0
Vegetation				
Gamma (Including Iodine)	59	0	61	0
Strontium-90	3	0	3	0
Water				
Carbon-14	2	0	2	0
Gross Alpha/Beta	98	0	99	0
Gamma	177	0	170	0
Iodine-131	46	0	47	0
Iron-55	33	0	33	0
Nickel-63	35	0	35	0
Strontium-90	80	0	81	0
Tritium	176	0	174	0
Total:	1590	0	1591	0

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

TABLE 8
GEL 2010 RADIOLOGICAL INTRA-LABORATORY DATA SUMMARY: BIAS AND PRECISION BY MATRIX

ANALYSIS	INSTRUMENT	LCS FILTER	DUP FILTER	LCS SWIPE	DUP SWIPE	LCS SOLID	DUP SOLID	LCS OIL	DUP OIL
Americium-241	Alpha Spec	2	2	47	38	485	477	13	12
Americium-243	Alpha Spec	2	2	1	0	53	50	2	2
Carbon-14	Liquid Scintillation	4	3	38	32	98	99	9	9
Gamma (long list of isotopes)	Gamma Spec	283	272	47	42	770	792	27	27
Gross Alpha/Beta	Gas Flow	111	135	20	18	20	18	42	42
Iodine-129	Gamma Spec	99	88	28	28	28	28	9	9
Iodine-131	Gamma Spec	6	4	0	0	0	0	0	0
Iron-55	Liquid Scintillation	89	8	30	24	46	48	8	8
Isotopic Plutonium	Alpha Spec and Liquid Scintillation	212	186	82	66	687	683	12	11
Isotopic Strontium	Gas Flow	165	136	41	34	365	367	1	1
Isotopic Thorium	Alpha Spec	82	59	0	0	371	372	0	0
Isotopic Uranium	Alpha Spec and ICP-MS	137	112	13	10	713	697	24	24
Lead-210	Gas Flow	44	26	0	0	33	34	0	0
Nickel-59	Gamma Spec	65	60	28	22	64	64	7	7
Nickel-63	Liquid Scintillation	95	89	39	30	75	74	8	8
Neptunium-237	Alpha Spec	67	59	32	23	107	107	10	9
Polonium-210	Alpha Spec	18	6	0	0	5	6	0	0
Promethium-137	Liquid Scintillation	8	5	0	0	12	11	0	0
Radium-226	Lucas Cell	44	31	0	0	167	175	0	0
Radium-228	Gas Flow	29	25	0	0	129	124	0	0
Technetium-99	Liquid Scintillation	87	75	32	24	142	145	12	12
Tritium	Liquid Scintillation	90	76	42	24	358	359	19	19
ANALYSIS	INSTRUMENT	LCS SLUDGE	DUP SLUDGE	LCS MISC SOLID	DUP MISC SOLID	LCS MISC LIQUID	DUP MISC LIQUID	LCS LIQUID	DUP LIQUID
Americium-241	Alpha Spec	4	4	231	220	22	19	383	335
Americium-243	Alpha Spec	1	1	21	21	5	4	12	11
Carbon-14	Liquid Scintillation	5	5	110	108	34	33	218	175
Gamma (long list of isotopes)	Gamma Spec	17	18	260	256	72	68	747	820
Gross Alpha/Beta	Gas Flow	27	27	112	109	87	80	1169	1180
Iodine-129	Gamma Spec	1	1	88	88	21	21	162	94
Iodine-131	Gamma Spec	0	0	0	0	0	0	11	14
Iron-55	Liquid Scintillation	3	3	74	72	42	43	123	103
Isotopic Plutonium	Alpha Spec or Liquid Scintillation	7	7	143	137	77	70	108	95
Isotopic Strontium	Gas Flow	13	13	61	60	80	76	16	12
Isotopic Thorium	Alpha Spec	13	13	145	132	8	8	289	359
Isotopic Uranium	Alpha Spec	24	24	102	87	39	36	640	557
Lead-210	Gas Flow	0	0	0	0	0	0	114	108
Nickel-59	Gamma Spec	0	0	68	66	9	9	76	63
Nickel-63	Liquid Scintillation	5	5	74	72	50	51	172	143
Neptunium-237	Alpha Spec	3	3	0	0	16	15	193	168
Polonium-210	Alpha Spec	0	0	1	1	0	0	3	3
Promethium-137	Liquid Scintillation	1	1	5	5	3	3	6	2
Radium-226	Lucas Cell	2	2	25	25	5	5	502	505
Radium-228	Gas Flow	0	0	27	28	1	1	432	426
Technetium-99	Liquid Scintillation	15	15	179	175	39	40	41	41
Tritium	Liquid Scintillation	9	9	125	122	8	8	898	824

TABLE 9
GEL 2010 CORRECTIVE ACTION SUMMARY

GEL CORRECTIVE ACTION IDENTIFICATION	**STATUS: OPEN/ CLOSED**	**ISSUE**	**Cause and Disposition**
CARR110209-542	OPEN	Eckert & Ziegler Analytics Fe-59 Failure in Milk	Monitoring in progress
CARR100617-496	CLOSED	MAPEP Series 22 PT Failures	The ICP-MS analysis of Uranium-235 and Uranium-238 failure was attributed to the use of the less vigorous digestion method (EPA Method 3050B). After contacting RESL, GEL discovered that they had used a more rigorous total dissolution process. The failure for Plutonium-238 was attributed to a data reviewer's error and lack of attention to detail to the region of interest that was not included in the data result. Approximately 400 additional counts should have been included. All analysts have been retrained on attention to detail of the ROI. For the remaining isotopic failures, the error was attributed to analyst error and failure to follow the instructions from the PT provider.
CARR100617-497	CLOSED	MRAD 12 PT Failures	The ICP-MS analysis of Uranium-235 and Uranium-238 failure was attributed to the use of the less vigorous digestion method (EPA Method 3050B). After contacting RESL, GEL discovered that they had used a more rigorous total dissolution process. For Uranium-238 in vegetation, air and water, the failure was attributed to method sensitivity by gamma spectroscopy. Future PT analysis will be performed using a more sensitive method.
CARR101210-527	CLOSED	MRAD 13 PT Failures	The failure for Bismuth-212 was attributed to a reporting error. The actual result (1660 pCi/kg) was within the acceptance range. The failure of Iron-55 was attributed to matrix interference. An additional recount with a smaller aliquot and fresh reagent rinses removed the interferant.

CARR100318-487	CLOSED	RAD-80 PT Failures	The Gross Alpha failure was attributed to a concentrated iron carrier. The Strontium-89 and Strontium-90 failures were attributed to the associated weights of the carriers utilized during the preparation and analysis.
CARR100907-512	CLOSED	RAD-82 PT Failures	Failures of the Gamma Emitters and the Naturals (Uranium) were attributed to analyst error and failure to follow the instructions from the PT provider. The failure of Strontium-89 and Strontium-90 was attributed to analyst error while diluting the sample. All analysts were retrained to the proper processes.
CARR101203-525	CLOSED	NY-337 PT Failures	For Cesium-134, Iodine-131, Strontium-89 and Strontium-90, and Radium-226, the failures could not be determined. The laboratory continues to monitor results of internal quality control samples.

8.0 DCPP 2010 ANNUAL LAND USE CENSUS

Diablo Canyon Power Plant (DCPP) Radiological Environmental Monitoring Program (REMP) personnel conducted a land use census in the vicinity of DCPP for 2010. The land use census is based on Nuclear Regulatory Commission (NRC) Regulatory Guide 4.8, "Environmental Technical Specifications for Nuclear Power Plants" and 10 CFR 50 Appendix I section IV. B. 3.
DCPP Program Directive CY2, "Radiological Monitoring and Controls Program" requires performance of a land use census.

DCPP IDAP RP1.ID11, "Environmental Radiological Monitoring Procedure", requires identification of the nearest milk animal, nearest residence, and the nearest broadleaf producing garden greater than 50 square meters (500 square feet) in each of the landward meteorological sectors within a distance of 8 kilometers (5 miles) of the plant. The land use census is conducted at least once per year during the growing season (between Feb 15 and Dec 1) for the Diablo Canyon environs.

The 2010 Land Use Census was conducted via a helicopter over-flight and landowner telephone interviews. The helicopter over-flight was conducted on March 12th, 2010. The telephone interviews were conducted October 11th through November 30th, 2010. Twelve individual landowners or tenants were contacted.

Milk:
No milk animals were identified within the first 8 kilometers (5 miles) of any sector.

Residences:
The nearest residence, relative to all sectors, is a small trailer located in the NW sector about 1.93 kilometers (1.2 miles) from the plant. Ranch workers occupy this BLANCHARD residence approximately 1 month per year during cattle round-ups.

A total of 17 residences were identified within the 8-kilometer (5-mile) radius of the plant, which were confirmed or appear to be occupied during 2010. Two abandoned structures are located in each of the NNW and NNE sectors.

A new structure (with miscellaneous equipment) was located during the over-flight at GPS coordinates N35* 13.203 , W120* 46.414. This structure is abandoned (non habitable).

The nearest residence in each sector is summarized in Table 1.

Gardens:
The land use census identified two household gardens greater than 50 square meters (500 square feet) that produce broadleaf vegetation. The READ garden (REMP 3C1) is approximately ¼ acre and located in the NNE sector at 7.08 kilometers (4.41 miles). The KOONZE garden (REMP 6C1) is approximately 500 square feet and located in the E sector at 7.24 kilometers (4.5 miles). Sampling of the READ garden (REMP 3C1) began during fourth quarter 2010 (4Q10).

MELLO manages a farm in the ESE sector along the site access road coastal plateau. The farm starts at approximately 4.8 km and extends to 7.2 km (3 to 4.5 miles) from the plant. This commercial farm produces no broadleaf vegetation. The farm area is about 100 acres of land with one planting per year. Commercial crops consist of about 100% cereal grass (oat hay). Less than 10 farm workers periodically occupy this area during the growing season.

Additional Land Use:

Much of the area outside the plant site-boundary is used for rotational cattle grazing by five separate cattle operations. For purposes of this census, the five cattle ranches are called BLANCHARD, SINSHEIMER, READ, ANDRE, and MELLO.

BLANCHARD has about 120 cattle outside the plant site-boundary and utilizes the NW, NNW, N, and NNE sectors. About 80 yearling cattle were sold to mass market in 2010. BLANCHARD slaughtered two cattle in 2010 for personal consumption.

Additionally, BLANCHARD managed about 200 goats that were used for weed abatement in all landward sectors within the plant site-boundary. During 2010, approximately 100 baby goats were born and then taken to Santa Margarita California where they are grass fed for 1 year. After one year, the 100 yearling goats are then to be sold to mass-market. BLANCHARD slaughtered one goat in 2010 for personal consumption.

BLANCHARD also managed about 100 sheep outside the plant site-boundary in the NW and NNW sectors. These sheep were allowed to breed and the yearlings were sold to mass market. BLANCHARD slaughtered one sheep in 2010 for personal consumption.

BLANCHARD meats were sampled by REMP personnel.

SINSHEIMER has about 100 cattle outside the plant site-boundary in the NNE sector. These cattle were allowed to breed and about 90 calves were sold to mass market in 2010. SINSHEIMER did not slaughter any cattle for personal consumption in 2010.

READ has about 120 cattle and 160 calves outside the plant site-boundary in the NNE sector. No cattle were sold to mass market in 2010. READ did not slaughter any cattle for personal consumption in 2010.

ANDRE has about 80 cattle outside the plant site-boundary in the ENE sector. About 80 calves were sold to mass market in 2010. ANDRE did not slaughter any cattle in 2010 for personal consumption.

MELLO manages about 800 cattle outside the plant site-boundary in the E, ESE, and SE sectors. Harris Ranch Beef Corporation owned these cattle and sold all of them to mass market in 2010. MELLO did not slaughter any cattle in 2010 for personal consumption.

Two landowners (JOHE and ANDRE) take wild game for personal consumption outside the plant site-boundary in the NNE, NE, and ENE sectors. This wild game consists of approximately 2 deer and 4 wild pigs per landowner.

There is a California State Park Ranger Office in the NNW sector at 7.483 kilometers (4.65 miles) from the plant. Approximately 3 people occupy this office from 1000 to 1500 each day per week.

There is a public campground (Islay Creek Campground) located in the NNW sector at Montana de Oro State Park at 7.387 kilometers (4.59 miles). This campground is near Spooner's Cove.

Approximately 713,000 people visited Montana de Oro State Park via day use permit.

Approximately 22,000 people spent the night at Islay Creek Campground.

There is public access to hiking trails at the north and south ends of the plant property.

The Point Buchon Trail is located at the north end of PG&E property and has about 20,000 visitors annually. It traverses about 3.5 miles of coastline from Coon Creek to Crowbar Canyon. The trail is open for day hikes Thursday thru Monday from approximately 0800-1600. Two to three people from California Land Management occupy the trail head booth during operating hours. This trail was opened to the public on July 13, 2007.

The Pecho Coast Trail is located at the south end of PG&E property and has about 2,500 visitors annually. The trail is approximately 3.7 miles long and leads to the Point San Luis Lighthouse near Avila Beach. Access is controlled (by permission only) and conducted by docents. This trail is just slightly outside the 5 mile radius of the plant. Pecho Coast Trail hikes are only available on Wednesdays (about 20 people) and Saturdays (about 40 people). 30-40 Lighthouse keepers occupy the Lighthouse grounds on Tuesdays, Thursdays, and Saturdays from 0800-1600. The Lighthouse property is owned by the Harbor District.

Groundwater Impacts:

No Groundwater impacts to report in 2010.

Monitoring Well 8S3 was added to the REMP in 2010 for the Groundwater Protection Initiative (GPI).

Additional Onsite Information:

The following plant equipment was placed into the Old Steam Generator Storage Facility for the duration of the plant operating license on the dates indicated. It should be noted that the Old Steam Generator Storage Facility is located within the site boundary.

Unit One old steam generators (4 total) : 2-14-09
Unit Two old steam generators (4 total) : 3-2-08
Unit One old reactor head (1 total) : 10-23-10
Unit Two old reactor head (1 total) : 11-6-09

DCPP began loading of it's Independent Spent Fuel Storage Installation (ISFSI) pad on 6-23-09. This process will be ongoing.

Table 1 summarizes the nearest residence location in each meteorological sector.
Figure 3 shows the location of the residences and gardens in the vicinity of DCPP.

Table 1

Land Use Census 2009

Distance in Kilometers (and Miles) from the point located centrally between both Units Nearest Milk Animal, Residence, and Vegetable Garden

22½ Degree [a] Radial Sector	Nearest Milk Animal	Nearest Residence km (mi)	Residence Azimuth Degree	Nearest Vegetable Garden km (mi)
NW	None	1.93 (1.2)	319.5	None
NNW	None	2.41 (1.5) [b]	331	None
N	None	None	—	None
NNE	None	5.21 (3.2)	019.8	7.08 (4.4) [c]
NE	None	7.89 (4.9)	036	None
ENE	None	7.08 (4.4)	063.5	None
E	None	5.95 (3.7)	097.5	7.24 (4.5) [d]
ESE	None	None	—	5.31 (3.3) [e]
SE	None	None	—	None

Table Notation:

(a) Sectors not shown contain no land (other than islets not used for the purposes indicated in this table) beyond the site-boundary.

(b) BLANCHARD residence is the full-time residence for critical receptor calculations.

(c) The READ vegetable garden is located in the NNE sector and located at the 020 azimuth degree. There is also a full time residence at this location.

(d) The KOONZE vegetable garden is located in the E sector and located at the 098 azimuth degree. There is also a full time residence at this location.

(e) The MELLO garden is the commercial farm along the westward side of the site access road; however, it does not produce broadleaf vegetation. This farm extends from 4.8 km to 7.2 km (3 to 4.5 miles) from the plant.

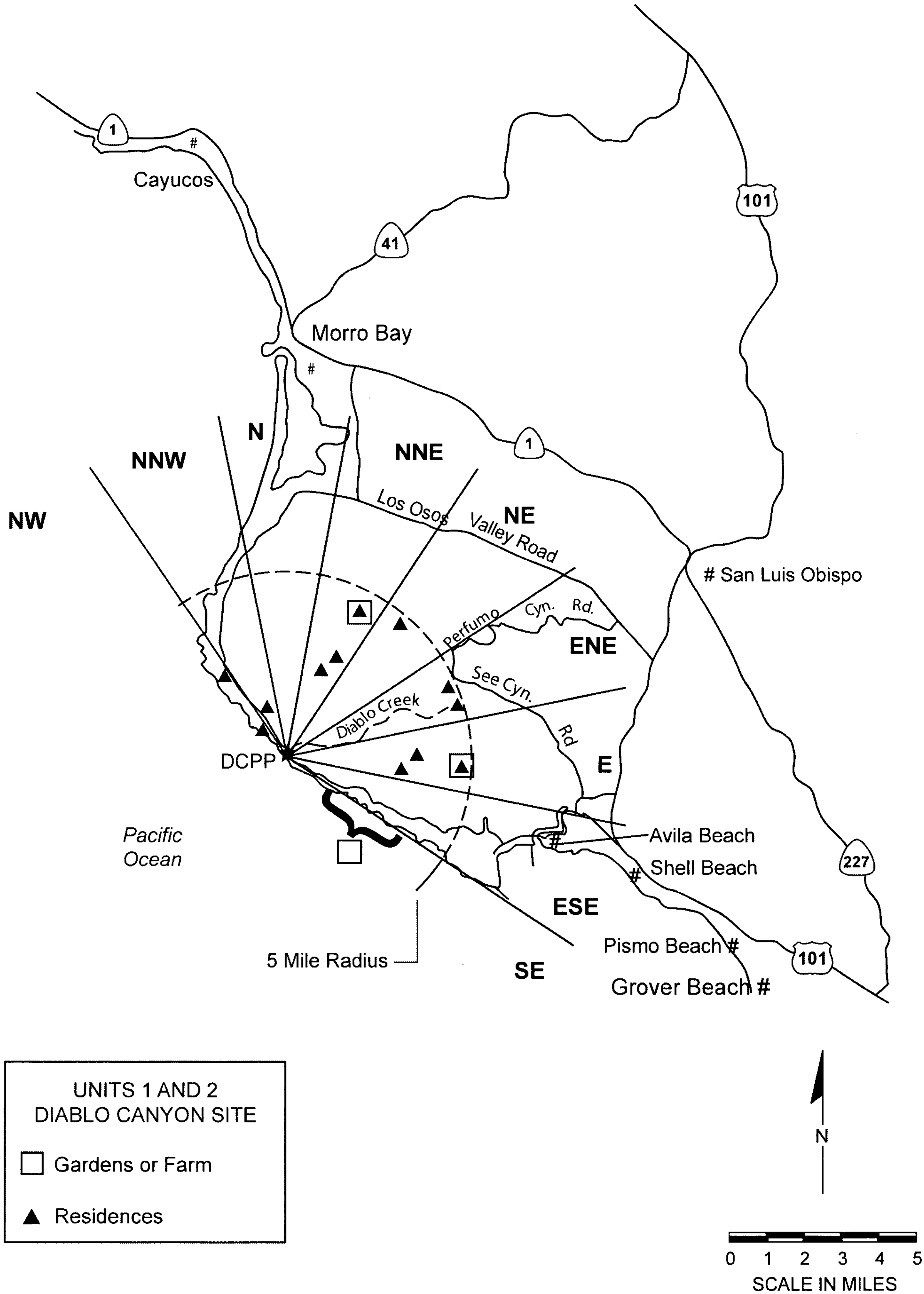
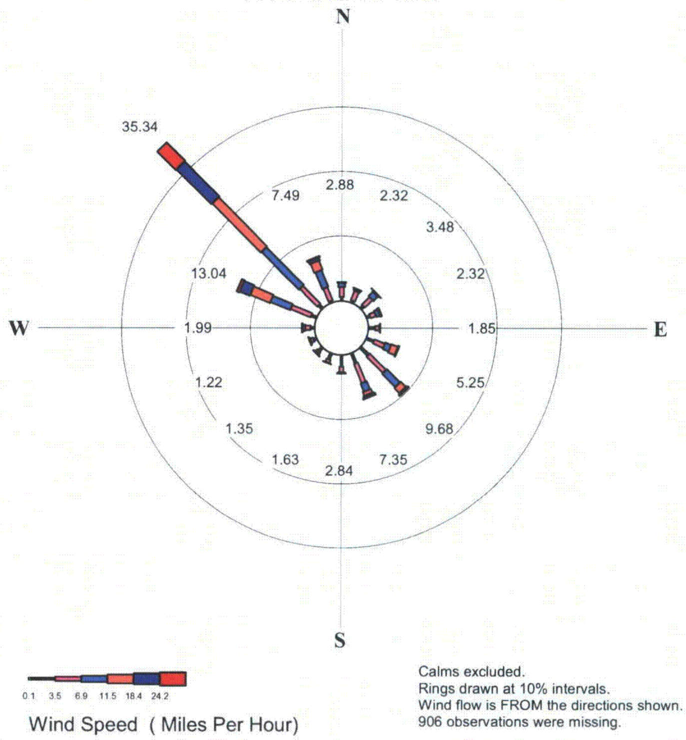


Figure 3. Units 1 and 2 Diablo Canyon Power Plant Land Use Census.

9.0 DCPP WIND ROSE CHART

Joint Frequency Distribution
Wind Speed and Wind Direction
Diablo Canyon Power Plant
10 Meter Level 2010



PERCENT OCCURRENCE: Wind Speed (Miles Per Hour)
LOWER BOUND OF CATEGORY

DIR	0.1	3.5	6.9	11.5	18.4	24.2
N	0.59	1.52	0.66	0.11	0.00	0.00
NNE	0.39	1.55	0.33	0.04	0.00	0.00
NE	0.60	1.71	0.95	0.18	0.01	0.03
ENE	0.59	0.87	0.60	0.27	0.00	0.00
E	1.03	0.61	0.17	0.04	0.00	0.00
ESE	1.23	1.77	0.98	1.07	0.19	0.00
SE	1.72	3.57	2.94	1.08	0.29	0.08
SSE	1.67	3.21	1.36	0.62	0.23	0.25

TOTAL OBS = 7854 MISSING OBS = 906

PERCENT OCCURRENCE: Wind Speed (Miles Per Hour)
LOWER BOUND OF CATEGORY

DIR	0.1	3.5	6.9	11.5	18.4	24.2
S	1.80	0.81	0.17	0.06	0.00	0.00
SSW	1.06	0.48	0.06	0.03	0.00	0.00
SW	0.75	0.43	0.13	0.04	0.00	0.00
WSW	0.53	0.47	0.15	0.06	0.00	0.00
W	0.64	0.83	0.37	0.13	0.01	0.01
WNW	0.94	3.32	3.35	3.27	1.71	0.45
NW	0.85	3.83	8.26	10.64	7.69	4.06
NNW	0.33	2.15	2.84	1.50	0.47	0.19

CALM OBS = 0

10.0 REFERENCES

1. DCPP Interdepartmental Administrative Procedure (IDAP), RP1.ID11, "Environmental Radiological Monitoring Procedure."

2. NRC Branch Technical Position, Revision 1, November 1979.

3. DCPP Program Directive, CY2, "Radiological Monitoring and Controls Program."

4. NEI 07-07, "Industry Ground Water Protection – Final Guidance Document", August 2007

5. NRC Regulatory Issue Summary 2008-03, "Return/Re-use of Previously Discharged Radioactive Effluents"; February 13, 2008

6. "Tritium Occurrence in Groundwater at Diablo Canyon Power Plant", by S.M. Stoller Corporation

7. "Groundwater Gradient Analysis", by Entrix Corporation, March 2010