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PSEG
Nuclear LLC

Technical Specification Section 6.9.1.7 (Salem)
Technical Specification Section 6.9.1.6 (Hope Creek)

LR-N16-0052

APR 28 2016

United States Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555-0001

Hope Creek Generating Station
Renewed Facility Operating License NPF-57
NRC Docket No. 50 354

Salem Nuclear Generating Station, Unit Nos. 1 and 2
Renewed Facility Operating Licenses Nos. DPR-70 and DPR-75
NRC Docket Nos. 50-272 and 50-311

Subject: 2015 Annual Radiological Environmental Operating Report

As required by Section 6.9.1.7 of Appendix A to Renewed Facility Operating Licenses DPR-70 and DPR-75 for Salem Generating Station Unit Nos. 1 and 2, and Section 6.9.1.6 of Appendix A to Renewed Facility Operating License NPF- 57 for Hope Creek Generating Station, PSEG Nuclear hereby transmits one copy of the combined 2015 Annual Radiological Environmental Operating Report. This report summarizes the results of the radiological environmental surveillance program for 2015 in the vicinity of the Salem and Hope Creek Generating Stations. The result of this program for 2015 was specifically compared to the result of the pre-operational program.

There are no regulatory commitments contained in this letter.

IE25
NRR

If you have any questions or comments on this transmittal, please contact Ms. Alison Kraus at (856) 339-7900.

Sincerely,

Eric S. Carr
Plant Manager
Salem Generating Station

F. Kenneth Grover
Plant Manager
Hope Creek Generating Station

pjd

Enclosure: 2015 Annual Radiological Environmental Operating Report

cc: Mr. Daniel Dorman, Regional Administrator - Region 1
Nuclear Regulatory Commission
Mr. Thomas Wengert, Project Manager Hope Creek/Salem USNRC
Mr. Justin Hawkins, NRC Senior Resident Inspector - Hope Creek (X24)
Mr. Patrick Finney, NRC Senior Resident Inspector – Salem (X24)
Mr. Thomas MacEwen, Hope Creek Commitment Coordinator (H02)
Mr. Thomas Cachaza, Salem Commitment Coordinator (X25)
Mr. Lee Marabella, Corporate Commitment Coordinator (N21)

Technical Specification Section 6.9.1.7 (Salem)
Technical Specification Section 6.9.1.6 (Hope Creek)

LR-N16-0052

Enclosure

Salem and Hope Creek Generating Stations

2015 Annual

Radiological Environmental Operating Report

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

PSEG Nuclear LLC, SALEM and HOPE CREEK GENERATING STATIONS

2015 ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

JANUARY 1 TO DECEMBER 31, 2015

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LIST OF ACRONYMS OR TERMS USED IN THIS TEXT (in alphabetical order)

AREOR	Annual Radiological Environmental Operating Report
%	Percent
A	Acceptable
a posteriori	*a posteriori* – an "after the fact" limit representing the capability of a measurement system
a priori	*a priori* – a "before the fact" limit representing the capability of a measurement system
AIO	Air Iodine
Analyte	The substance being identified and measured in a chemical analysis
APT	Air Particulates
Bq	Bequerels
C	Control
CVCS	Chemical Volume Control System
DOE	Department of Energy
dpm	Disintegrations per minute
ECH	Crabs
ERA	Environmental Resource Associates
ESF	Fish
ESS	Sediment
EZA	Eckert & Ziegler Analytics, Inc.
FPL	Broad Leafy Vegetation
FPV	Vegetables
GAM	Game
GEL	General Engineering Laboratories; Duplicate sample analysis vendor
Gr-A	Gross alpha
Gr-B	Gross beta
H-3	Tritium
HCGS	Hope Creek Generating Station
IDM	Immersion Dose Monitor
ISFSI	Independent Spent Fuel Storage Installation
kg	Kilogram
keV	Kilo-electron volts
L	Liter
LLD	Lower Limit of Detection
LTS	Laboratory Testing Services
m^3	Cubic meter
MAPEP	Mixed Analyte Performance Evaluation Program
MDC	Minimum Detectable Concentration
mL	Milliliter
MLK	Milk
mR	MilliRoentgen - a unit of radiation, used to measure the exposure of somebody or something to X-rays and gamma rays, defined in terms of the ionization effect on air.

mrem	Millirem - a unit for measuring amounts of radiation, equal to the effect that one roentgen of X-rays or gamma-rays would produce in a human being. It is used in radiation protection and monitoring.
MWe	Megawatt Electric
MWt	Megawatt Thermal
N	Not Acceptable
NCR	Nonconformance Report
NELAC	National Environmental Laboratory Conference
Notification	Documentation of an event into the PSEG Corrective Action Program
NRC	U.S. Nuclear Regulatory Commission
ODCM	Offsite Dose Calculation Manual
pCi	Picocuries
PD	Passive Dosimeter
PE	Performance Evaluation
PSEG	Public Service Enterprise Group
PT	Performance Testing
PWR	Potable (drinking) Water - Raw
PWT	Potable (drinking) Water - Treated
QA	Quality Assurance
REMP	Radiological Environmental Monitoring Program
RGPP	Radiological Groundwater Protection Program
SA	Salem
SAR	Safety Analysis Report
SCFM	Standard Cubic Feet per Minute
SGS	Salem Generating Station
SOL	Soil
SOP	Standard Operating Procedures
Standard Quarter	Standard Quarter = 92 days
SWA	Surface Water
TBE	Teledyne Brown Engineering; Primary sample analysis vendor
TEDA	Triethylene-diamine
TLD	Thermoluminescent Dosimeter - A TLD measures ionizing radiation exposure by measuring the intensity of visible light emitted from a crystal in the detector when the crystal is heated. The intensity of light emitted is dependent upon the radiation exposure.
TS	Technical Specifications
uCi	Microcuries
USEPA	United States Environmental Protection Agency
VGT	Fodder Crops
W	Warning
WWA	Ground (well) Water

I. Summary and Introduction

PSEG Nuclear LLC operates Salem Generating Station (SGS) and Hope Creek Generating Station (HCGS) (collectively, the Site) and implements a Radiological Environmental Monitoring Program (REMP) in accordance with the Site Offsite Dose Calculation Manuals (ODCMs). The REMP monitors and evaluates the environment surrounding the Site to ensure that there are no adverse impacts to the public or the environment. The results of the REMP are published annually in this Report, the Annual Radiological Environmental Operating Report (AREOR). This AREOR provides a summary and interpretation of the data collected from January 1 through December 31, 2015 (the Reporting Period).

The REMP is based on NRC guidance as reflected in the Site ODCMs and establishes sample media, sampling locations, sampling frequency and analytical sensitivity requirements. It also identifies indicator and control locations established for comparison purposes to distinguish plant related radioactivity from naturally occurring or other radioactivity from man-made sources. The environmental monitoring program also verifies the projected and anticipated radionuclide concentrations in the environment and evaluates exposures associated with releases of radionuclides from the Site as described by the ODCM.

This program satisfies the requirements of Section IV.B.2 of Appendix I to 10 CFR 50 and provides surveillance of all appropriate critical exposure pathways to man. The REMP also complies with the following Technical Specifications and ODCM requirements:

Unit	Technical Specifications	ODCM
SGS U1	6.8.4.h	3/4. 12.1 6.9.1.7
SGS U2	6.8.4.h	3/4. 12.1 6.9.1.7
HCGS U1	6.8.4.h	3/4. 12.1 6.9.1.6

To demonstrate compliance with the requirements, samples of air particulates, air iodine, milk, surface water, ground (well) water, potable (drinking) water, vegetables, fodder crops, fish, crabs, oysters, game, and sediment were collected and analyzed. External radiation dose measurements were also made in the vicinity of the Site using passive dosimeters. These environmental media were analyzed for one or more of the following: gamma emitting isotopes, tritium (H-3), iodine-131 (I-131), gross alpha, gross beta and immersion dose. Measurements made in the vicinity of the Site were compared to background or control measurements and the preoperational REMP study performed before SGS Unit 1 became operational. The results of these analyses were used to assess the environmental impact of Site operations, thereby demonstrating compliance with the applicable Site Technical Specifications, ODCMs, and Federal regulations.

For the Reporting Period, there were a total of 1710 analyses performed on 1370 environmental samples. Most of the radioactive materials noted in this Report are either naturally occurring in the environment such as K-40 or Be-7, or a result of other non-plant related human activities, such as historical atmospheric nuclear weapons testing or medical wastes from offsite. The majority of the remaining samples did not contain plant related radionuclides above detection limits.

There were two samples that had positive detections for radionuclides that could be attributed to plant related activities. There was one surface water detection of tritium at location 12C1 in the October composite sample at a concentration of 257 pCi/L, followed by another surface water tritium detection at location 7E1 in the November

composite sample at a concentration of 242 pCi/L. Both positive detections were evaluated and determined that there were no significant dose impacts.

The detection capabilities for environmental samples, required by the Site ODCMs, were achieved for the Reporting Period. Any exceptions to the program are noted in the Report and the associated PSEG corrective action identifier was included in parenthesis.

Based on the results from the Reporting Period, the concentration of plant related radioactive material in the environment that could be attributable to Site operations was only a small fraction of the combination of naturally occurring and man-made radioactivity. The data obtained during the Reporting Period were comparable to the results obtained during the preoperational phase of the program, and are lower than the applicable limits. Combined with historical results collected since commercial operation, it can be concluded that the observed results were as expected and therefore, we conclude that the operation of the Site had no significant radiological impact on the environment.

II. The Radiological Environmental Monitoring Program

The Site is located in Lower Alloways Creek Township, Salem County, New Jersey. SGS consists of two operating pressurized water nuclear power reactors. SGS Unit 1 has a net rating of 1180 megawatt electric (MWe) and SGS Unit 2 has a net rating of 1178 MWe. The licensed core power for both Units is 3459 megawatt thermal (MWt). HCGS consists of an operating boiling water nuclear power reactor, which has a net rating of 1212 MWe. The licensed core power is 3840 MWt.

The Site is located on a man-made peninsula on the east bank of the Delaware River called Artificial Island. The peninsula was created by the deposition of hydraulic fill from dredging operations. The surrounding environment is characterized mainly by the Delaware River Estuary and Bay, extensive tidal marshlands, and low-lying meadowlands. These land types make up vast majority of the land area within five miles of the site, with most of the remaining land used for agriculture.

Since 1968, a Radiological Environmental Monitoring Program (REMP) has been conducted at the Site. Starting in December 1972, a more extensive radiological monitoring program was initiated in preparation for the operation of SGS Unit 1. The operational REMP was initiated in December 1976 when SGS Unit 1 achieved criticality.

An overview of the 2015 REMP is provided in Table B-1, Salem and Hope Creek Generating Stations Radiological Environmental Monitoring Program. Radioanalytical data from samples collected under this program were compared with results from the preoperational phase and historical operational results. This Report presents the results from January 1 through December 31, 2015 (The Reporting Period), for the Site REMP.

A. Objectives of the Operational REMP:

The objectives of the Operational REMP as described in the Site ODCMs are:

1. To determine whether any significant increases occur in the concentration of radionuclides in critical pathways of exposure in the vicinity of Artificial Island.
2. To determine if the operation of the Site has resulted in any increase in the inventory of long lived radionuclides in the environment.
3. To detect any change in ambient gamma radiation levels.
4. To verify that Site operations do not have detrimental effects on the health and safety of the public or on the environment.

B. Implementation of the Objectives:

The following describes the actions taken by PSEG Nuclear LLC to meet the REMP objectives listed above:

1. Samples of various media were selected for monitoring due to the radiological dose impact to humans and other organisms. The selection of samples was based on:
   (a) Established critical pathways for the transfer of plant related radionuclides through the environment to man, and
   (b) Experience gained during the preoperational phase. Sampling locations

were determined based on site meteorology, Delaware River Bay estuarine hydrology, local demography, and land uses.

2. Sampling locations are divided into two classes: indicator and control. Indicator stations are those which have the potential to be influenced by Site operations. Control samples are collected at locations which are believed to be unaffected by Site operations, usually at 15 to 30 kilometers (9.3 to 18.6 miles) away from the Site. Fluctuations in the levels of radionuclides and direct radiation at indicator stations are evaluated with respect to analogous fluctuations at control stations. Indicator and control station data are also evaluated relative to preoperational data.

3. Appendix A, Radiological Environmental Monitoring Program Summary, describes the coding system which identifies sample type and location and describes and summarizes the analytical results in accordance with Section 6.9.1.7 of the SGS ODCM and Section 6.9.1.6 of the HCGS ODCM. Table A-1 summarizes average, minimum and maximum activities of the indicator locations, control locations and the location with the highest mean using values above the Minimum Detectable Concentration (MDC).

4. Appendix B, Sample Designation and Locations, Table B-1 Salem and Hope Creek Generating Stations' Radiological Environmental Monitoring Program, lists the types of samples collected, sample frequency, and analysis types. Table B-2, Sampling locations, station codes, locations, and latitude and longitude coordinates.

5. The sampling locations are also indicated on Maps B-1, Salem and Hope Creek Generating Stations' Radiological Environmental Monitoring Program On-site Sampling Locations and B-2, Salem and Hope Creek Generating Stations' Radiological Environmental Monitoring Program Off-site Sampling Locations.

III. Program Description

A. Data Interpretation

Results of analyses are grouped according to sample type and presented in Appendix C, Data Tables. All results above the Lower Limit of Detection (LLD) are at a confidence level of ± 2 sigma. This represents the range of values into which 95% of repeated analyses of the same sample should fall. As defined in NRC NUREG-1301 and NUREG-1302, LLD is the smallest concentration of radioactive material in a sample that will yield a net count (above system background) that will be detected with 95% probability, with only 5% probability of falsely concluding that a blank observation represents a "real signal." The equation for determining LLD is:

$$LLD = \frac{4.66 \bullet S_b}{E \bullet V \bullet 2.22 \bullet Y \bullet \exp(-\lambda \Delta t)}$$

4.66 is the statistical factor from NUREG 1301 and 1302

Sb is the standard deviation of the background counting rate or of the counting rate of a blank sample as appropriate, as counts per minute,

E is the counting efficiency, as counts per disintegration,

V is the sample size in units of mass or volume,

2.22 is the number of disintegrations per minute per picocurie,

Y is the fractional radiochemical yield, when applicable,

λ is the radioactive decay constant for the particular radionuclide (sec-1), and

Δt for environmental samples is the elapsed time between sample collection, or end of the sample collection period, and time of counting (sec).

The LLD is an "*a priori*" number, which represents the capability of the measurement system (including instrumentation, procedure and sample type), and not an after the fact criteria for the presence of activity. All analyses are designed to achieve the required detection limits for environmental sample analysis as described in the Site ODCMs.

The Minimum Detectable Concentration (MDC) is defined as above with the exception that the measurement is an "*a posteriori*" (after the fact) estimate of the presence of activity. The MDC should be lower than the required LLD.

The grouped data were averaged and standard deviations calculated. The ± 2 sigma deviations of the averaged data represent sample and not analytical variability. For reporting and calculation of averages, any positive result above the MDC is considered to be a valid result.

B. Program Exceptions.

During the Reporting Period, the only exceptions to REMP sampling requirements involved Air Sampling Station weekly run times. In all instances, a sufficient sample was collected during the week to meet the required LLD, therefore there were no missed samples

Air Sampling Stations

REMP air station 15S2 operated approximately 73.9 hours less than expected the week of 03/30/15 to 04/06/15; 3.0 hours less than expected the week of 04/06/15 to 04/13/15; and 40 hours less than expected the week of 04/13/15 to 04/20/15. All three instances were due to power outages for planned maintenance. During weekly filter change out on 04/20/15 the sampler was observed to be operating normally and no other problems were noted. (Notifications: 20684005, 20687547, and 20686211)

REMP air station 5D1 operated approximately 15.3 hours less than expected the week of 06/08/15 to 06/15/15 due to a blown fuse. During weekly filter change out on 06/15/15 the fuse was replaced. The sampler was observed to be operating normally following the replacement and no other problems were identified. (Notification: 20695299)

REMP air station 1F1 operated approximately 36.8 hours less than expected the week of 06/22/15 to 06/29/15. There was severe weather that week which is

believed to have disrupted power to the sampling station. During weekly filter change out on 06/29/15 the sampler was observed to be operating normally and no other problems were identified. (Notification: 20695303)

REMP air station 5D1 operated approximately 5.5 hours less than expected the week of 06/22/15 to 06/29/15. There was severe weather that week which is believed to have disrupted power to the sampling station. During weekly filter change out on 06/29/15 the sampler was observed to be operating normally and no other problems were identified. (Notification: 20695504)

REMP air stations 5S1 and 5S2 operated approximately 5.4 hours less than expected the week of 07/06/15 to 07/13/15 due to a planned electrical outage for maintenance. The sampler was observed to be operating normally following return to service and no problems were identified. (Notification: 20696790)

REMP air station 14G1 operated approximately 5.5 hours less than expected the week of 07/20/15 to 07/27/15. There was severe weather that week which is believed to have disrupted power to the sampling station. During weekly filter change out on 07/27/15 the sampler was observed to be operating normally and no other problems were identified. (Notification: 20697852)

REMP air station 7S2 operated approximately 45.4 hours less than expected the week of 10/12/15 to 10/19/15. The electrical breaker was found tripped and was reset on 10/19/15. Approximately 5.1 hours of sample was missed the week of 10/19/15 to 10/26/15 before power was restored to the sample pump. After the breaker was reset, the sampler was observed to be operating normally and no other problems were identified. (Notification: 20706777)

C. Program Changes

The following enhancements were made to the program during the Reporting Period:

Oyster Samples

Although oysters are not harvested for human consumption within five miles of the Site discharge, oysters were added as a Management Audit Sample during the Reporting Period to evaluate ingestion dose from liquid effluents. Two samples were obtained during the New Jersey harvest season and analyzed by gamma spectroscopy. The program will be evaluated to determine if continued sampling will add value for the future.

Surface Water Sample Frequency

Surface water sampling frequency was increased to two samples per month in July 2015. The two samples are combined to create a monthly composite sample for analysis; the analysis frequency was not changed.

Passive Dosimeter Type Change

The type of passive dosimeter (PD) used for Direct Radiation monitoring was changed from Harshaw type 17 to Panasonic type 20. Both types were installed at all 58 monitored locations during fourth quarter 2014 and the first two quarters of 2015 for side by side comparisons. For the third and fourth quarters of 2015, only Panasonic type 20 dosimeters were used.

D. Quality Assurance Program

Teledyne Brown Engineering

The results reported by TBE are consistent with the Quality Assurance Program as described in the TBE Quality Assurance Manual and the TBE Procedure Manual.

GEL Laboratories

The results reported by GEL Laboratories, LLC are consistent with the Quality System described in GEL's Quality Assurance Manual and the requirements of ISO17025:2005.

E. Inter-laboratory Comparison Program

Inter-laboratory Comparison Programs are independent checks on the precision and accuracy of laboratory analyses. These checks are performed as part of the REMP and are part of the quality assurance program.

TBE analyzed Performance Evaluation (PE) samples of air particulate, air iodine, milk, soil, vegetation and water matrices, as appropriate for 139 analyses (Appendix D, Tables D-1 through D-3).

GEL analyzed Performance Evaluation (PE) samples of air particulate, air iodine, milk, soil, vegetation and water matrices, as appropriate for 429 analyses (Appendix D, Tables D-4 through D-7).

The PE samples, supplied by Eckert & Ziegler Analytics, Inc (EZA), Environmental Resource Associates (ERA), and the Department of Energy's (DOE) Mixed Analyte Performance Evaluation Program (MAPEP), were evaluated against the following acceptance criteria:

EZA Evaluation Criteria

EZA's evaluation report provides a ratio of reported results and EZA's known value. Since flag acceptance criteria values are not assigned by EZA, TBE evaluates the reported ratios based on internal QC requirements, which are based on the DOE MAPEP criteria.

ERA Evaluation Criteria

ERA's evaluation report provides an acceptance range for control and warning limits with associated flag values. ERA's acceptance limits are established in accordance with the United States Environmental Protection Agency (USEPA), National Environmental Laboratory Conference (NELAC) performance testing (PT) program requirements, or ERA's standard operating procedure (SOP) for the Generation of Performance Acceptance Limits, as applicable. The acceptance

limits are either determined by a regression equation specific to each analyte or a fixed percentage limit promulgated under the appropriate regulatory document.

DOE Evaluation Criteria

MAPEP's evaluation report provides an acceptance range with associated flag values. The MAPEP defines three levels of performance: Acceptable (flag = "A"), Acceptable with Warning (flag = "W"), and Not Acceptable (flag = "N"). Performance is considered acceptable when a mean result for the specified analyte is ± 20% of the reference value. Performance is "acceptable with warning" when a mean result falls in the range from ± 20% to ± 30% of the reference value (i.e., 20% < bias < 30%). If the mean result is greater than 30%, the results are deemed not acceptable.

Teledyne Brown Engineering

TBE participated in inter-laboratory cross-checks during the reporting period, and of the 139 inter-laboratory analyses TBE performed, 130 met the specified acceptance criteria. Eight analyses (APT - Cr-51, Soil Sr-90; U-234/233, Gr A, Water Ni-63; Sr-90; Vegetation Sr-90 samples; and Water natural U;) did not meet the specified acceptance criteria for the following reasons and are being addressed through the TBE Corrective Action Program.

Note: the Department of Energy (DOE) Mixed Analyte Performance Evaluation Program (MAPEP) samples are created to mimic conditions found at DOE sites which do not resemble typical environmental samples obtained at commercial nuclear power facilities.

TBE's EZA June 2015 air particulate Cr-51 result of 323 ± 45.5 pCi was higher than the known value of 233 pCi with a ratio of 1.39. The upper ratio of 1.20 was exceeded. The air particulate sample is counted at a distance above the surface of the detector to avoid detector summing which could alter the results. Cr-51 had the shortest half-life (27.7 days) and the lowest gamma energy (320.08 keV) of this mixed nuclide sample. Additionally, Cr-51 has only one gamma energy and

also has a low intensity (9.83 gamma photons produced per 100 disintegrations). This geometry produces a larger error for Cr-51 and other gamma emitters as any distance from the detector decreases the counting rate and the probability of accurately detecting the nuclide energy. Taking into consideration the uncertainty, the activity of Cr-51 overlaps with the known value at a ratio of 1.19, which would be considered acceptable. (NCR 15-18)

TBE's MAPEP March 2015 soil Sr-90 result of 286 Total Bq/kg was lower than the known value of 653 Bq/kg, exceeding the lower acceptance range of 487 Bq/kg. The failure was due to incomplete digestion of the sample. Incomplete digestion of samples causes some of the sample to be left behind and is not present in the digested sample utilized for analysis. The procedure has been updated to include a more robust digestion using stirring during the heating phase. The MAPEP September 2014 soil Sr-90 series prior to this study was evaluated as acceptable with a result of 694 and an acceptance range of 601 – 1115 Bq/kg. The MAPEP September 2015 series soil Sr-90 after this study was evaluated as acceptable with a result of 429 and an acceptance range of 298 – 553 Bq/kg. (NCR 15-13)

TBE's MAPEP March 2015 air particulate U-234/233 result of 0.0211 ± 0.0120 Bq/sample was higher than the known value of 0.0155 Bq/sample, exceeding the upper acceptance range of 0.0202 Bq/sample. Although evaluated as a failure, taking into consideration the uncertainty, TBE's result would overlap with the known value, which is statistically considered acceptable. MAPEP spiked the sample with significantly more U-238 activity (a found to known ratio of 0.96) than the normal U-234/233. Due to the extremely low activity, it was difficult to quantify the U-234/233. (NCR 15-13)

TBE's MAPEP March 2015 air particulate gross alpha result of 0.448 Bq/sample was lower than the known value of 1.77 Bq/sample, exceeding the lower acceptance range of 0.53 Bq/sample. The instrument efficiency used for gross alpha is determined using a non-attenuated alpha standard. The MAPEP filter has the alphas embedded in the filter, requiring an attenuated efficiency. When samples contain alpha particles that are embedded in the sample media, due to

the size of the alpha particle, some of the alpha particles are absorbed by the media and cannot escape to be counted. When the sample media absorbs the alpha particles this is known as self-absorption or attenuation. The calibration must include a similar configuration/media to correct for the attenuation. In order to correct the low bias, TBE will create an attenuated efficiency for MAPEP air particulate filters. The MAPEP September series air particulate gross alpha result of 0.47 Bq/sample was evaluated as acceptable with a range of 0.24 – 1.53 Bq/sample. Unlike the MAPEP Samples, air particulate Gross alpha analyses for power plants are not evaluated as a direct count sample. Power plant air particulate filters for gross alpha go through an acid digestion process prior to counting and the digested material is analyzed. (NCR 15-13)

TBE's MAPEP September water Ni-63 result of 11.8 ± 10.8 Bq/L was higher than the known value of 8.55 Bq/L, exceeding the upper acceptance range of 11.12 Bq/L. The Ni-63 half-life is approximately 100 years. Nickel-63 has no gamma energy and emits only beta particles during decay. Nickel-63 is considered to be a "soft" or low energy beta emitter, which means that is the beta energy is very low. The maximum beta energy for Ni-63 is approximately 65 kev, much lower than other more common nuclides such as Co-60 (maximum beta energy of 1549 keV). The original sample was run with a 10 mL aliquot which was not sufficient for the low level of Ni-63 in the sample. The rerun aliquot of 30 mL produced an acceptable result of 8.81 Bq/L. (NCR 15-21)

TBE's MAPEP September air particulate Sr-90 result of 1.48 Bq/sample was lower than the known value of 2.18 Bq/sample, exceeding the lower acceptance range of 1.53 Bq/sample. In the past, MAPEP has added substances (unusual compounds found in DOE complexes) to various matrices that have resulted in incomplete removal of the isotope of interest for the laboratories analyzing the cross checks. TBE suspects that this may be the cause of this error. Many compounds, if not properly accounted for or removed in the sample matrix, can cause interferences to either indicate lower activity or higher activity. TBE will no longer analyze the air particulate Sr-90 through MAPEP but will participate in the EZA cross check program to perform both Sr-89 and Sr-90 in the air particulate matrix. (NCR 15-21)

TBE's MAPEP September vegetation Sr-90 result of 0.386 Bq/sample was lower than the known value of 1.30 Bq/sample, exceeding the lower acceptance range of 0.91 Bq/sample. In the past, MAPEP has added substances (unusual compounds found in DOE complexes) to various matrices that have resulted in incomplete removal of the isotope of interest for the laboratories analyzing the cross checks. TBE suspects that this may be the cause of this error. Many compounds if not properly accounted for or removed in the sample matrix can cause interferences to either indicate lower activity or higher activity. (NCR 15-21)

TBE's ERA May water Sr-89/90 results of 45.2 and 28.0 pCi/L, respectively were lower than the known values of 63.2 and 41.9 pCi/L, respectively, exceeding the lower acceptance limits of 51.1 and 30.8 pCi/L, respectively. The yields were on the high side of the TBE acceptance range, which indicates the presence of excess calcium contributed to the yield, resulting in low results. (NCR 15-09)

TBE's ERA November water natural Uranium result of 146.9 pCi/L was higher than the known value of 56.2 pCi/L, exceeding the upper acceptance limit of 62.4 pCi/L. The technician failed to dilute the original sample and used the entire 12 mL sample. When the results were recalculated without the dilution and using the 12 mL aliquot, the result of 57.16 agreed with the assigned value of 56.2. (NCR 15-19)

GEL

For the GEL laboratory, 455 out of 461 analyses performed met the specified acceptance criteria. Six analyses (one Cs-137 in water, one Ra-228 in water, one U-Total in vegetation, one I-131 in water, one Sr-89 in water and one Sr-90 in water) did not meet the specified acceptance criteria for the following reasons and are being addressed through GEL's Corrective Action Program:

GEL's ERA First Quarter 2015 Cs-137 in water result was higher than the ERA known value. After a thorough review of all data, a definitive reason for the failure could not be determined. GEL assumes an unidentified random error with this sample. (Corrective Action CARR 150223-929)

GEL's ERA First Quarter 2015 Ra-228 in water result was higher than the ERA known value. After a thorough review of all data, a definitive reason for the failure could not be determined. GEL assumes an unidentified random error with this sample. (Corrective Action CARR 150223-929)

GEL's ERA Second Quarter 2015 Uranium-Total in vegetation result was higher than the ERA known value. The failure was due to a transcription error when entering the data into the data base. (Corrective Action CARR150519-954)

GEL's ERA Second Quarter 2015 I-131 in water result was lower than the ERA known value. The failure was due to a transcription error when entering the data into the data base. (Corrective Action CARR150519-954)

GEL's ERA Third Quarter 2015 Sr-89 in water result was lower than the ERA known value. After a thorough review of all data, a definitive reason for the failure could not be determined. GEL assumes an unidentified random error with this sample. (Corrective Action CARR150825-971)

GEL's ERA Fourth Quarter 2015 Sr-90 in water result was lower than the ERA known value. After a thorough review of all data, a definitive reason for the failure could not be determined. GEL assumes an unidentified random error with this sample. (Corrective Action CARR151130-993)

F. Summary of Results: Split Sample Comparison Program

Duplicate samples were obtained for some samples of air particulates, air iodine, milk, surface water, vegetables, and sediment. These samples were analyzed by GEL as comparison and validation of TBE results (Table C-20).

1. Air Particulates

Gross beta was detected by both GEL and TBE in all 52 duplicate weekly air particulate samples. GEL detects significantly higher gross beta results due to different calibration energy sources used by each lab. (80110821)

All four duplicate quarterly composite samples analyzed had positive results for Be-7 and were in agreement within analytical errors at both labs.

2. Air Iodine

All 52 weekly duplicate sample results from GEL were less than MDC, which is in agreement with the corresponding weekly sample results from TBE.

3. Milk

Naturally occurring K-40 was detected in all 12 duplicate monthly samples and were in agreement within analytical errors for the two labs.

4. Surface Water

Naturally occurring K-40 was detected in all four GEL results but on only three of the corresponding TBE results. All detections were in agreement within the calculated analytical error for the samples.

5. Vegetables

Naturally occurring K-40 was detected by both labs in all 14 duplicate samples analyzed. GEL detected Be-7 in one of the duplicate samples while TBE did not. These results were compared using NRC Inspection Procedure 84525: Quality Assurance and Confirmatory Measurements for In-Plant Radiochemical Analysis. The NRC ratio based on resolution was used for acceptance criteria and all K-40 results passed. The one result that was detected by GEL but not detected by TBE was also considered acceptable. This is considered an acceptable duplicate sample comparison based on the NRC acceptance criteria.

6. Sediment

Naturally occurring K-40 was detected in both sample by both of the laboratories. GEL also detected Ra-226 on both samples, but at levels below the MDC of TBE so a direct comparison could not be performed. Results are in agreement within analytical errors.

IV. Results and Discussion

The analytical results of the 2015 REMP samples are divided into categories based on exposure pathways: atmospheric, direct radiation, terrestrial, and aquatic. The ingestion pathway is evaluated under the terrestrial and aquatic categories. The analytical results for the Reporting Period are summarized in Appendix A, Radiological Environmental Monitoring Program Summary. The data for individual samples are presented in Appendix C, Data Tables. The data are compared to the preoperational REMP data (1973-1976) and to historical data since site operation commenced. The samples collected and analysis results indicate that the Site REMP was conducted in compliance with the Site Technical Specifications and ODCMs.

The REMP for the Site has historically included samples and analyses not specifically required by the Site ODCMs in addition to those required. Management Audit Samples are samples that are taken to augment the radiological effluent monitoring program, but do not fulfill any regulatory requirement. These analyses are referenced throughout the Report as Management Audit Samples. PSEG continues to collect these samples. The summary tables in this Report include these Management Audit samples and associated analytical results. The following is a list and quantity of the Management audit samples collected in 2015:

Management Audit Sample Type	Number of Samples
Vegetables	42
Well Water	12
Potable Water (raw and treated)	12/12
Fodder Crops	4
Game	3
Oysters	4

A. Atmospheric

Air particulate (APT) samples were collected on glass fiber filters with low-volume air samplers sampling at approximately 1.5 SCFM. Air sample volumes were measured with calibrated dry-gas meters.

Samples for Iodine were collected from the air by adsorption on triethylene-diamine (TEDA) impregnated charcoal cartridges connected in series after the air particulate filters.

1. Air Particulates

Air particulate (APT) samples were collected weekly at seven indicator locations (16E1, 15S2, 1F1, 2F6, 5D1, 5S1 and 7S2), one duplicate station (5S2) and one control location (14G1). Each weekly sample collected was analyzed for gross beta by TBE and GEL. Quarterly composites of the weekly samples from each station were analyzed for specific gamma emitters. The duplicate air station sample was shipped to a laboratory for duplicate analysis (GEL). (Table C–1 and Reference [1] RMC-TR-77-03)

Gross Beta

Gross beta activity was detected in 359 of 364 of the indicator station samples at concentrations ranging from 4E-03 pCi/m^3 to 31E-03 pCi/m^3 with an average

concentration of 13E-03 pCi/m^3, and in all of the control station samples at concentrations ranging from 4E-03 pCi/m^3 to 33E-03 pCi/m^3 with an average of 13E-03 pCi/m^3. The maximum preoperational level detected was 920E-03 pCi/m^3 with an average concentration of 74E-03 pCi/m^3 (Table C–2 and Reference [1] RMC-TR-77-03) [Figure 1 - Gross Beta Activity in Air Particulates – Quarterly Average For All Locations 2005 Through 2015].

Gamma Spectroscopy

Gamma spectroscopy was performed on each of the 32 quarterly composite samples. Naturally occurring Be-7 was detected and no other gamma emitters were detected in any of the samples.

Naturally occurring Be-7, attributed to cosmic ray activity in the atmosphere, was detected in 27 of 28 indicator station composites at concentrations ranging from 65E-03 pCi/m^3 to 157E-03 pCi/m^3 with an average concentration of 111E-03 pCi/m^3, and in the four control station composites ranging in concentration from 75E-03 pCi/m^3 to 116E-03 pCi/m^3 with an average concentration of 100E-03 pCi/m^3. The maximum preoperational level detected was 330E-03 pCi/m^3 with an average concentration of 109E-03 pCi/m^3. (Table C–1 and Reference [1] RMC-TR-77-03)

2. Air Iodine

Filtered air iodine samples (AIO) were collected weekly at seven indicator locations (16E1, 15S2, 1F1, 2F6, 5D1, 5S1 and 7S1), one duplicate station (5S2) and one control location (14G1). The duplicate air station sample was shipped to GEL for duplicate analysis. Each sample was analyzed for I-131, and none was detected in any indicator or control samples during the Reporting Period. The maximum preoperational level detected was 42E-03 pCi/m^3. (Table C–3 and Reference [1] RMC-TR-77-03)

B. Direct Radiation

Ambient radiation levels in the environment were monitored at locations on the Site and in the surrounding areas with pairs of passive dosimeters (PD) supplied and analyzed by Mirion Technologies. During this Reporting Period, the type of dosimeter was changed as described in Program Changes. Packets containing these PDs were placed in the owner-controlled area, around the Site at various distances and in each land based meteorological sector. Six were placed in control locations and the balance of measurement locations were placed at areas of interest such as population centers, nearby residences, and schools. The PDs at each location are changed and analyzed quarterly.

A total of 58 Immersion Dose Monitor (IDM) locations were established to monitor for direct radiation during 2015, including 20 on-site locations (1S1, 2S2, 2S4, 3S1, 4S1, 5S1, 6S2, 7S1, 8S1, 9S1, 10S1, 11S1, 12S1, 13S1, 14S1, 15S1, 15S2, 16S1, 16S2, and 16S3), 32 off-site locations within the 10 mile zone (1F1, 2E1, 2F2, 2F5, 2F6, 3E1, 3F2, 3F3, 4D2, 4F2, 5D1, 5F1, 6F1, 7F2, 8F1, 9F1, 10D1, 10F2, 11E2, 11F1, 12E1, 12F1, 13E1, 13F2, 13F3, 13F4, 14D1, 14F2, 15D1, 15F3, 16E1 and 16F2) and six control locations beyond 10 miles (1G3, 3G1, 3H1, 10G1, 14G1, and 16G1).

Two Type 20 PDs are placed at each location. Each of the legacy Type 17 PDs contained two CaF:Dy and two LiF:Mg, Ti elements, while each Type 20 PD contains three CaSO:Dy elements which monitor for photon exposure. Each PD also contains one LiBO:Mn element which is not used for this application.

The average quarterly dose rate for the off-site dosimeters was 13.8 mR/Standard Quarter. The average quarterly dose rate for site boundary locations, excluding locations 1S1 and 16S2, was 12.8 mR/Standard Quarter. The control locations had an average quarterly dose rate of 13.8 mR/Standard Quarter. Subtracting the dose from the control locations from either the onsite or offsite locations indicates that there is no net dose from Site operations. (Table C–4)

The two site boundary locations 1S1 and 16S2 are addressed separately due to dose rates higher than the other site boundary PDs. The ambient radiation levels as measured by the two site boundary locations 1S1 and 16S2 ranged from 24.1 mR/Standard Quarter to 39.4 mR/Standard Quarter. The doses at these two locations were influenced by the radiation shine from the dry cask storage located in the nearby Independent Spent Fuel Storage Installation (ISFSI). Assuming a nominal background of 52 mR/year (13 mR/Standard Quarter) and using the highest dose rate from location 16S2, the maximum dose rate above background in these areas was calculated to be of 71.9 mrem/year (131.9 mR/year – 52 mR/year * 0.9 mrem/mR).

The nearest resident in the North sector is greater than five miles and the nearest resident in the NNW sector is 4.2 miles from the Site. Dose rates at this distance are near background as indicated above. However, 40 CFR 190 and 10 CFR 72.104 both limit the dose to a real member of the public to 25 mrem in a year to the total body. To demonstrate compliance with these regulations, an individual member of the public is assumed to enter the site boundary area near the ISFSI for 20 days per year. Based on this, the dose that this hypothetical individual would receive was calculated to be 3.9 mrem/year (71.9 mrem/year * 20 days / 365 days) which was well below the federal limit for exposure of 25 mrem/year.

The preoperational average for the quarterly PD readings was 4.4 mR/Standard Month or 13.2 mR/Standard Quarter. A review of historic results and direct radiation measurements for the reporting period confirmed that the radiation levels in the vicinity of the Site were similar to previous years.

C. Terrestrial

Terrestrial REMP sampling includes the collection of milk, well water, potable water, vegetables, fodder crops and soil samples.

Milk samples (MLK) were taken semi-monthly when cows were on pasture and monthly when cows were not grazing on open pasture from three indicator

locations (13E3, 14F4, 2G3) and one control location (3G1). Animals are considered on pasture from April to November of each year. Samples were collected in new polyethylene containers, sodium bisulfite was added as a sample preservative, then the samples were frozen and transported in ice chests to TBE.

Well water samples (WWA) were collected monthly from one location (3E1). Separate raw water (PWR) and treated potable water (PWT) composite samples were collected monthly from one location (2F3). Each monthly composite was made up of daily samples collected by the City of Salem Water and Sewer Department. All samples were collected in new polyethylene containers and shipped to TBE for analysis.

Locally grown vegetables (FPV) were collected at the time of harvest at seven locations (1F1, 2F9, 3F8, 14F4, 15F4, 1G1, and 2G2); fodder crops (VGT) were sampled at four locations (13E3, 14F4, 2G3 and 3G1); and broad leaf vegetation (FPL) was sampled at seven locations (10D1, 15S2, 16S1, 1G1, 1S1, 3H5 and 7S2). The vegetables and fodder samples are additional samples (Management Audit) taken to enhance the radiological monitoring program. There is no dairy farm within three miles of the Site and there is only one dairy farm within five miles. Therefore, broadleaf vegetation is grown, maintained and harvested monthly during the growing season. All samples were weighed, packaged and shipped to TBE for analysis.

1. Milk

Milk samples were collected at four local dairy farms; two farms in New Jersey (2G3 and 3G1) and two farms in Delaware (13E3 and 14F4). Each sample was analyzed for I-131 and gamma emitters.

I-131

I-131 was not detected above MDC in any of the 80 samples analyzed. The maximum preoperational level detected was 65 pCi/L, which occurred following

a period of atmospheric nuclear weapons tests. (Table C–5 and Reference [1] RMC-TR-77-03)

Gamma Spectroscopy

No plant related gamma emitters were detected above the MDC in any of the indicator or control station milk samples.

Naturally occurring K-40 was detected in all 80 milk samples with concentrations for the 60 indicator station samples ranging from 1,133 pCi/L to 1,757 pCi/L with an average concentration of 1,350 pCi/L, and the 20 control station sample concentrations ranging from 1,094 pCi/L to 1,480 pCi/L, with an average concentration of 1,276 pCi/L. The maximum preoperational level detected was 2,000 pCi/L with an average concentration of 1,437 pCi/L. (Table C–5 and Reference [1] RMC-TR-77-03)

2. Well Water (Ground Water)

Although offsite wells in the vicinity of the Site are not directly affected by plant operations, well water samples were collected monthly from one farm (3E1). Samples from this well are considered Management Audit samples.

Gross Alpha

Gross alpha activity was not detected above the MDC in any of the well water samples. The maximum preoperational level detected was 9.6 pCi/L. (Table C–6 and Reference [1] RMC-TR-77-03)

Gross Beta

Gross beta activity was detected in two of 12 well water samples above the MDC with concentrations ranging from 2.7 pCi/L to 2.8 pCi/L, with an average concentration of 2.7 pCi/L. The preoperational results ranged from <2.1 pCi/L to 38 pCi/L, with an average value of 9 pCi/L. (Table C–6 and Reference [1] RMC-TR-77-03)

Tritium

Tritium activity was not detected above the MDC in any of the well water samples. The maximum preoperational level detected was 380 pCi/L. (Table C–6 and Reference [1] RMC-TR-77-03)

Gamma Spectroscopy

No plant related gamma emitters were detected above the MDC in any of the indicator or control station well water samples. Naturally occurring K-40 and Ra-226 were not detected in any of the well water samples. The maximum preoperational levels detected were 30 pCi/L and 2.0 pCi/L, respectively. (Table C-7 and Reference [1] RMC-TR-77-03)

3. Potable Water (Drinking Water)

Both raw and treated potable water samples were collected and composited by The City of Salem Water and Sewer Department personnel at the local water treatment facility. Each sample consisted of daily aliquots composited into a monthly sample. The raw water source for this plant is a combination of surface water from Laurel Lake and groundwater from its adjacent wells. These are Management Audit samples as no liquid effluents discharged from the Site directly affect this pathway.

Gross Alpha

No Gross alpha activity was detected in any of the raw or treated water samples. The maximum preoperational level detected was 2.7 pCi/L. (Table C–8 and Reference [1] RMC-TR-77-03)

Gross Beta

Gross beta activity was detected in 11 of the 12 raw water samples and in 11 of the 12 treated water samples. The concentrations for the raw samples ranged from 3.1 pCi/L to 7.6 pCi/L. Concentrations for the treated water ranged from 3.7 pCi/L to 7.8 pCi/L. The average concentration for both raw and treated water was 5.2 pCi/L. The maximum preoperational level detected was 9.0 pCi/L with an average concentration of 4.2 pCi/L. (Table C–8 and Reference [1] RMC-TR-77-03)

Tritium

Tritium activity was not detected in any of the raw or treated water samples. The maximum preoperational level detected was 350 pCi/L with an average of 179 pCi/L. (Table C–8 and Reference [1] RMC-TR-77-03)

I-131

I-131 activity was not detected in any of the raw or treated water samples. No preoperational data were available for comparison, since I-131 was not analyzed as a specific radionuclide prior to 1989. However, I-131 analytical results to date have been below the MDC. (Table C–9 and Reference [1] RMC-TR-77-03)

Gamma Spectroscopy

No plant related gamma emitters were detected above the MDC in any of the potable water samples. Naturally occurring K-40 was not detected in any of the

raw or treated water samples. No preoperational data were available for comparison. Naturally occurring Ra-226 was not detected in any raw or treated water samples. The maximum preoperational level detected for Ra-226 was 1.4 pCi/L. (Table C–9 and Reference [1] RMC-TR-77-03)

4. Vegetables

There are no farm products that are irrigated with water in which plant effluents have been discharged. The Delaware River at the location of the Site is brackish and therefore is not used for irrigation.

A variety of food products are sampled on and around the Site; however, the variety is dependent on the farmer's preference. These vegetables are collected as Management Audit samples. In addition, broadleaf vegetation was grown by PSEG personnel at four onsite locations and one offsite location in Delaware at 3.9 miles SSW for purposes of REMP sampling. These broadleaf vegetable samples are collected since there are no dairy farms operating within the five km (three mile) radius of the Site. The closest dairy farm (13E3) is located in Odessa, DE at 5.0 miles (7.88 km).

All samples (vegetable and broadleaf) were analyzed for gamma emitters and included asparagus, cabbage, collards, kohlrabi, soy beans, sweet corn, peppers, tomatoes, and peaches. These samples were obtained from 11 indicator stations (81 samples) and three control stations (12 samples). The results for these samples are discussed below.

Gamma Spectroscopy

No plant related gamma emitters were detected above the MDC in any of the indicator or control station vegetable samples.

Naturally occurring Be-7, attributed to cosmic ray activity in the atmosphere, was detected in one of the 81 indicator station samples at a concentration of

265 pCi/kg (wet), and in one of the 12 control station samples at a concentration of 2634 pCi/kg (wet). No preoperational Be-7 data was available for comparison.

Naturally occurring Ra-226 was detected in one of the 81 indicator station samples at a concentration of 803 pCi/kg (wet). It was not detected in any of the control station samples.

Naturally occurring K-40 was detected in all 81 indicator samples, with concentrations ranging from 1,693 pCi/kg (wet) to 15,380 pCi/kg (wet) with an average concentration of 4,079 pCi/kg (wet), and in all 12 control station samples at concentrations ranging from 1,557 pCi/kg (wet) to 5,576 pCi/kg (wet) with an average concentration of 2,411 pCi/kg (wet). The maximum preoperational level detected was 4,800 pCi/kg (wet) with an average concentration of 2,140 pCi/kg (wet). (Table C-10 and Reference [1] RMC-TR-77-03)

5. Fodder Crops

Although not required by the Site ODCMs, four samples of silage normally used as cattle feed were collected from three indicator stations and one control station. It was determined that these products could be an element in the food-chain pathway. These fodder crops are collected as Management Audit samples and analyzed for gamma emitters. All four locations from which samples were collected are milk sampling stations.

Gamma Spectroscopy

No plant related gamma emitters were detected above the MDC in any of the indicator or control station fodder crop samples.

Naturally occurring Be-7, attributed to cosmic ray activity in the atmosphere, was not detected in any of the three indicator samples or control station

samples. The maximum preoperational level detected for fodder was 4,700 pCi/kg (wet) with an average concentration of 2,000 pCi/kg (wet).

Naturally occurring K-40 was detected in all three indicator samples at concentrations ranging from 3,152 pCi/kg (wet) to 3,678 pCi/kg (wet) with an average concentration of 3,345 pCi/kg (wet), and in the control station sample at a concentration of 1,491 pCi/kg (wet). Preoperational results averaged 7,000 pCi/kg (wet). (Table C–11 and Reference [1] RMC-TR-77-03)

6. Soil

Soil is sampled every three years at nine locations and analyzed for gamma emitters. These Management Audit samples were last collected in 2013 and will not be collected again until 2016 (Table C–12) [Figure 2 - Cesium-137 Activity in Soil 1974 through 2015 (Triennial)].

7. Game

Although not required by the Site ODCMs, three muskrat samples were collected from two indicator stations. The game samples were collected as Management Audit samples and analyzed for gamma emitters.

Gamma Spectroscopy

No plant related gamma emitters were detected above the MDC in any of the indicator game samples.

Naturally occurring K-40 was detected in all three samples at concentrations ranging from 2,709 to 3,555 pCi/kg (wet) with an average concentration of 3,048 pCi/kg (wet). No preoperational data were available for comparison. No other gamma emitters were detected. (Table C–13 and Reference [1] RMC-TR-77-03)

D. Aquatic

This sample set includes edible fish, shoreline and riverbed sediment, surface water, crabs, and oysters.

Surface water samples were collected offshore in new polyethylene containers that were rinsed twice with the sample medium prior to collection. The surface water samples were transported to TBE for analysis.

Edible fish were collected using gill nets while crabs were caught in commercial traps. These samples were processed by separating the flesh from the bone and shell. The flesh was placed in sealed containers and frozen before being transported in ice chests to TBE for analysis.

Sediment samples were taken with a bottom grab sampler and frozen in sealed polyethylene containers before being transported in ice chests to TBE. For the river bottom sediment, a marine GPS was used to locate the correct site and the sampling boat was maneuvered over the area until the correct amount of sample was obtained (grabbed) with the sediment dredge.

Personnel collected and prepared the location 6S2 shoreline sediment sample (an onsite location). For this location, a square area, measuring one meter on each side was staked out and then divided into a grid of nine smaller boxes, three per side. A one inch deep scoop from the center of each of the small grids was taken. All the aliquots were combined and the total sample transported in the ice chest to TBE.

Oyster samples are collected by personnel licensed to harvest oysters by the State of New Jersey. Oysters in the vicinity of the plant are not large enough to be sold to the public, so they have been added to the REMP as Management Audit samples. Oysters are collected and shucked, and then the flesh and internal fluids are placed in sealed containers and frozen before being transported in ice chests to TBE for analysis.

1. Surface Water

Surface water samples were collected once a month until July and twice a month for the remainder of the Reporting Period at four indicator stations and one control station in the Delaware River Bay Estuary. During the second part of the year, two samples were collected per month, which were combined to create a single monthly composite sample that was then analyzed. One location (11A1) is at the outfall area (which is the area potentially impacted by effluents discharged from the Site into the Delaware River), one location is downstream from the outfall area (7E1), and one location is directly west of the outfall area at the mouth of the Appoquinimink River (12C1). Two upstream locations are sampled, one in the Delaware River (1F2) and one at the mouth of the Chesapeake and Delaware Canal (16F1), the latter being sampled when the flow is from the Canal into the river.

Station 12C1, located directly west of the Site, at the mouth of the Appoquinimink River, serves as the control. 12C1 was chosen as the control location because the physical characteristics of this station more closely resemble those of the outfall area than do those at the farther upstream location (1F2). As discussed in the preoperational summary report, due to its tidal nature, there are flow rate and salinity variations in the Delaware Estuary. These variations account for differences in concentrations of K-40.

Tritium

Tritium activity was detected in one of 48 indicator samples with a concentration of 242 pCi/L at location 7E1 and in one of the 12 control samples with a concentration of 257 pCi/L at location 12C1. Evaluation of the samples that had positive tritium activity are described below. The maximum preoperational level detected was 600 pCi/L, with an average concentration of 210 pCi/L (Table C-14 and Reference [1] RMC-TR-77-03) [Figure 3 - Tritium Activity in Surface Water - Quarterly Average 2005 through 2015].

The October 2015 composite sample for surface water sampled at location 12C1 (2.5 miles WSW of Site on West Bank of Delaware River) identified tritium activity at 257 pCi/L with a two sigma uncertainty of ± 126 pCi/L. The MDC for this sample was 184 pCi/L. The dose impact from this concentration is 5.67E-04 mrem/yr to the maximum exposed individual through the consumption of fish. This does not present a significant dose impact.

The individual samples that constitute this composite sample were obtained on 10/6/2015 at 12:50 and 10/19/2015 at 09:25. Three analyses were performed on the composite sample with the following activities noted:

Tritium Activity, pCi/L	Two Sigma Uncertainty, pCi/L	Minimum detectable Concentration (MDC),pCi/L
204	125	186
201	129	193
257	126	184

A correlation was performed to evaluate the relationship between the quantities of radioactive effluent released and the resultant dose to individuals from principal pathways of exposure. An assumption used to correlate the results was that tritium measured at 12C1 was associated with a permitted effluent release that occurred within one day of the composite sample collection. There was one release that occurred from SGS Unit 2 that met this criteria, which was from the #22 Chemical Volume Control System Monitor Tank. The release occurred approximately 17 hours before the composite sample was obtained. Due to the lack of a local stream flow gauge and uncertainties associated with tidal influences, a very conservative estimate of dilution flow in the Delaware River consisting of measured steam flow and inputs farther upstream from the site was developed. The correlation determined that the actual measured concentration is much less than the potential calculated value. Differences may be due to many unknown factors such as tidal recirculation and various river and tidal mixing factors. (Notification: 20710945)

The November 2015 composite sample for surface water sampled at location 7E1 (4.5 miles SE of Site, West of Mad Horse Creek) identified tritium activity at 242 pCi/L with a two sigma uncertainty of ± 184 pCi/L. The MDC for this sample was 184 pCi/L. The dose impact from this concentration is 5.34E-04 mrem/yr to the maximum exposed individual through the consumption of fish. This does not present a significant dose impact.

The individual samples that constitute this composite sample were obtained on 11/2/2015 at 08:08 and 11/24/2015 at 12:33. Four analyses were performed on the composite sample, with two positive indications of tritium, with the following activities noted:

Tritium Activity, pCi/L	Two Sigma Uncertainty, pCi/L	Minimum detectable Concentration (MDC),pCi/L
242	125	184
127	129	< 200
153	128	< 197
216	124	184

A correlation was performed to evaluate the relationship between the quantities of radioactive effluent released and the resultant dose to individuals from principal pathways of exposure. An assumption used to correlate the results was that tritium measured at location 7E1 was associated with a permitted effluent release that occurred within two days of the composite sample collection. There was one release that occurred from SGS Unit 2 that met this criteria, which was from the #21 Chemical Volume Control System Monitor Tank. The release occurred approximately 48 hours before the composite sample was obtained. Due to the lack of a local stream flow gauge and uncertainties associated with tidal influences, a very conservative estimate of dilution flow in the Delaware River was used to evaluate the release consisting of measured steam flow and inputs farther upstream from the site. The correlation determined that the actual measured concentration is similar that the potential calculated value. Differences may be due to many unknown factors

such as tidal recirculation/recapture factors, various river and tidal mixing factors, and various other unknown environmental factors. (Notification: 20710945)

Gamma Spectroscopy

No plant related gamma emitters were detected above the MDC in any of the indicator surface water samples.

Naturally occurring K-40 was detected in 26 of the 48 indicator station samples at concentrations ranging from 35 pCi/L to 147 pCi/L with an average concentration of 83 pCi/L, and in six of the 12 control station samples at concentrations ranging from 43 pCi/L to 167 pCi/L and an average of 99 pCi/L. The maximum preoperational level detected for K-40 was 200 pCi/L with an average concentration of 48 pCi/L. (Table C-15 and Reference [1] RMC-TR-77-03)

I-131

I-131 was not detected in any of the 48 indicator samples. It was not detected in any of the control station samples. All other gamma emitters were less than the MDC. (Table C-15)

2. Fish

Edible species of fish were collected semi-annually at two indicator stations and one control station and analyzed for gamma emitters in edible flesh. Sample species collected in 2015 were: striped bass, summer flounder, catfish, blue fish, and white perch.

Gamma Spectroscopy

No plant related gamma emitters were detected above the MDC in any of the indicator or control station fish samples.

Naturally occurring K-40 was detected in all seven indicator station samples at concentrations ranging from 3,549 pCi/kg (wet) to 4,512 pCi/kg (wet) with an average concentration of 3,949 pCi/kg (wet), and all five control station samples at concentrations ranging from 3,718 pCi/kg (wet) to 5,145 pCi/kg (wet) with an average concentration of 4,428 pCi/kg (wet). The maximum preoperational level detected was 13,000 pCi/kg (wet) with an average concentration of 2,900 pCi/kg (wet). (Table C–16 and Reference [1] RMC-TR-77-03)

3. Blue Crab

Blue crab samples were collected twice during the season at one indicator and one control station. The edible portions were analyzed for gamma emitters.

Gamma Spectroscopy

No plant related gamma emitters were detected above the MDC in any of the indicator or control station blue crab samples.

Naturally occurring K-40 was detected in the indicator station samples at concentrations of 3,129 pCi/kg (wet) and 3,771 pCi/kg (wet) with an average concentration of 3,450 pCi/kg (wet), and in both control station samples at concentrations of 3,015 pCi/kg (wet) and 3,868 pCi/kg (wet) with an average concentration of 3,442 pCi/kg (wet). The maximum preoperational level for K-40 detected was 12,000 pCi/kg (wet) with an average concentration of 2,835 pCi/kg (wet). All other gamma emitters were less than the MDC. (Table C–17 and Reference [1] RMC-TR-77-03)

4. Sediment

Sediment samples were collected semi-annually from six indicator stations and one control station. Location 6S2 is the only shoreline sediment sample location and is directly subjected to tidal fluctuations. The remaining locations are offshore.

Gamma Spectroscopy

Naturally occurring K-40 was detected in all 11 indicator station samples at concentrations ranging from 2,545 pCi/kg (dry) to 16,840 pCi/kg (dry), with an average concentration of 7,405 pCi/kg (dry), and at both control stations samples at concentrations of 10,070 pCi/kg (dry) and 16,490 pCi/kg (dry) with an average concentration of 13,280 pCi/kg (dry). The maximum preoperational level detected was 21,000 pCi/kg (dry) with an average concentration of 15,000 pCi/kg (dry).

Cesium-137 was not detected in any of the indicator samples. The maximum preoperational level detected was 400 pCi/kg (dry) with an average concentration of 150 pCi/kg (dry) (Table C–18 and Reference [1] RMC-TR-77-03).

Naturally occurring Ra-226 was detected in two of the 11 indicator station samples at concentrations ranging from 1,615 pCi/kg (dry) to 2,649 pCi/kg (dry) with an average concentration of 2,132 pCi/kg (dry) and in one of the control station samples at a concentration of 1385 pCi/kg (dry). The maximum preoperational level detected was 1,200 pCi/kg (dry) with an average concentration of 760 pCi/kg (dry).

Naturally occurring Th-232 was detected in 10 of the 11 indicator station samples at concentrations ranging from 196 pCi/kg (dry) to 920 pCi/kg (dry) with an average concentration of 599 pCi/kg (dry), and in both of the control station samples at concentrations of 657 pCi/kg (dry) and 882 pCi/kg (dry) with an average concentration of 769 pCi/kg (dry). The maximum preoperational level detected was 1,300 pCi/kg (dry) with an average concentration of 840 pCi/kg (dry). All other gamma emitters were less than the MDC. (Table C–18 and Reference [1] RMC-TR-77-03)

5. Oysters

Oyster samples were collected twice during the season at one indicator and one control station. The edible portions were analyzed for gamma emitters.

Gamma Spectroscopy

No plant related gamma emitters were detected above the MDC in any of the indicator or control station oyster samples.

Naturally occurring K-40 was detected in the indicator station samples at concentrations of 853 pCi/kg (wet) and 1,130 pCi/kg (wet) with an average concentration of 992 pCi/kg (wet), and in both control station samples at concentrations of 2,275 pCi/kg (wet) and 1,512 pCi/kg (wet) with an average concentration of 1,894 pCi/kg (wet). Both the indicator and control samples obtained in October contained naturally occurring Ra-226. The Ra-226 concentrations were 776 and 846 respectively. There were no preoperational analyses preformed on oysters as there were no significant quantities of oysters or other shellfish within 5 miles of the plant discharge. All other gamma emitters were less than the MDC. (Table C–19 and Reference [6] Salem Nuclear Generating Station Units 1 and 2, Environmental Report, Operating License Stage)

E. Land Use Survey

A land use survey was conducted during the Reporting Period in each of the 16 meteorological sectors to identify, within a distance of 8 km (5 miles), the location of the nearest milk animal, the nearest residence and the nearest garden of greater than 50 m^2 (500 ft^2) producing broad leaf vegetation. In accordance with the Site ODCMs, the survey was performed using a visual survey, Post Office inquiries, Yellow Pages, and Google Earth mapping software.

A comparison of the identified locations from the 2015 table with the 2014 table shows that there was no change to the nearest milk animal or nearest resident. However, no vegetable garden larger than 50 m^2 (500 ft^2) with broadleaf vegetation was identified as being present within the 8 km radius. Therefore, dose evaluations do not need to be updated and no changes to the Site ODCMs are required. The 2015 Land Use Survey results are summarized below:

Meteorological Sector	Milk Animal August, 2015 Km (miles)	Nearest Residence August, 2015 Km (miles)	Vegetable Garden August, 2015 Km (miles)	Meat Animal August, 2015 Km (miles)
N	None	None	None	None
NNE	None	8.0 (5.0)	None	6.8 (4.2)
NE	None	6.2 (3.9)	None	None
ENE	None	6.2 (3.9)	None	None
E	None	None	None	None
ESE	None	None	None	None
SE	None	None	None	None
SSE	None	None	None	None
S	None	None	None	None
SSW	None	6.2 (3.9)	None	None
SW	None	6.9 (4.3)	None	7.3 (4.6)
WSW	None	7.1 (4.4)	None	None
W	7.8 (4.9)	6.5 (4.0)	None	None
WNW	None	5.5 (3.4)	None	None
NW	None	5.9 (3.7)	None	None
NNW	None	6.8 (4.2)	None	None

V. Annotations to Previous AREOR

Page 19 – Air Particulate Gamma Spectroscopy: The air particulate K-40 result listed as 56E-03 pCi/m^3 should be corrected to 32E-03 pCi/m^3.

Page 31– Surface Water Tritium: The March 2014 Surface Water sample from location 11A1 (0.2 miles SW; in the Salem Outfall area) identified tritium activity at 1760 pCi/L with a two sigma uncertainty of ± 231 pCi/L (1.76E-06 ± 2.31E-07 µCi/ml). A duplicate sample was analyzed by a different vendor and activity identified was 1780 pCi/L with two sigma uncertainty of ± 546 pCi/L which validated the first result. These values do not present significant dose to any exposure pathway.

REMP sample location 11A1 is near the permitted liquid effluent release points for the Site, so a release would need to occur within a few hours of the sample collection to affect that sample location. There were two releases that occurred during this timeframe, one from Salem Unit 2 #22 Chemical Volume Control System Monitor Tank and the second from Hope Creek Circulating Water Dewatering Sump.

A correlation was performed to evaluate the relationship between the quantities of radioactive effluent released and the resultant dose to individuals from principal pathways of exposure. A conservatively high tritium concentration of 1960 pCi/L was used and it was determined that dose to highest exposed population, Adult, would be less than 0.2% of the Federal limit of 25 mrem/year.

Page 28 – Fodder Crop Gamma Spectroscopy: The control station sample Be-7 result listed as 265 pCi/kg (wet) should be corrected to <154 pCi/kg (wet).

Page 34 – Sediment Gamma Spectroscopy: The Cs-137 observed in the indicator sample is attributed to fallout from historical weapons testing.

VI. Hope Creek Technical Specification Limit for Primary Water Iodine Concentration

The Hope Creek primary coolant results for Dose Equivalent Iodine-131, Total Gamma, and Total Beta were reviewed. The specific activity of the primary coolant did not exceed 0.2 microcuries per gram Dose Equivalent I-131 (DEI). The Total Gamma and the Total Beta activity (microcuries per gram) did not exceed the 100/E-Bar limit. Therefore, Hope Creek did not exceed the Technical Specifications limit specified in section 3.4.5.

VII. Conclusions

The Radiological Environmental Monitoring Program for the Site was conducted during 2015 in accordance with the Site ODCMs. The required sample analysis LLD values were achieved (See Appendix A and Appendix C) and the REMP objectives were also met. The data collected demonstrates that the Site was operated in compliance with the Site ODCMs' REMP requirements.

The concentration of radioactive material in the environment that could be attributable to Site operations was only a small fraction of the total radioactivity when compared to the concentration of naturally occurring and non-plant related man-made radioactivity in the environment.

Since these results were comparable to the results obtained during the preoperational phase of the program, which ran from 1973 to 1976, and with historical results collected since commercial operation, it can be concluded that the operation of the Site had no significant radiological impact on the environment.

VIII. References

[1] Radiation Management Corporation. "Artificial Island Radiological Environmental Monitoring Program - Preoperation Summary - 1973 through 1976". RMC-TR-77-03, 1978.

[2] Public Service Enterprise Group. "Offsite Dose Calculation Manual"- Salem Generating Station. Revision 27.

[3] Public Service Enterprise Group. "Offsite Dose Calculation Manual"- Hope Creek Generating Station. Revision 27.

[4] U.S. Nuclear Regulatory Commission: NUREG-1301, "Offsite Dose Calculation Manual Guidance: Standard Radiological Effluent Controls for Pressurized Water Reactors", published April 1991.

[5] U.S. Nuclear Regulatory Commission: NUREG-1302, "Offsite Dose Calculation Manual Guidance: Standard Radiological Effluent Controls for Boiling Water Reactors", published April 1991.

[6] U.S. Atomic Energy Commission, Docket NOS. 50-272/50-311, "Salem Nuclear Generating Station Units 1 and 2, Environmental Report, Operating License Stage".

APPENDIX A

RADIOLOGICAL ENVIRONMENTAL MONITORING

PROGRAM SUMMARY

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SAMPLE DESIGNATION

PSEG identifies samples by a three part code. 1) The first two letters are the program station identification code. Because of the proximity of SGS and HCGS, a common environmental surveillance program is conducted using the identification code "SA". 2) The next three letters are for the media sampled:

AIO = Air Iodine
APT = Air Particulates
ECH = Hard Shell Blue Crab
ESF = Edible Fish
ESS = Sediment
WWA = Well Water
IDM = Immersion Dose (PD)
MLK = Milk
PWR = Potable Water (Raw)
PWT = Potable Water (Treated)
SWA = Surface Water
EOY = Oysters

3) The last three or four symbols are a location code based on direction and distance from the site center point. The midpoint of a line between Salem Unit 1 & 2 containments was used as the site center point. Of these, the first two represent each of sixteen angular sectors centered about the reactor site. Sector one is divided evenly by the north axis and other sectors are numbered in a clockwise direction as follows:., 2=NNE, 3=NE, 4=ENE, 5=E, 6=ESE, 7=SE, 8=SSE, 9=S, 10=SSW, 11=SW, 12=WSW, 13=W, 14=WNW, 15=NW and 16=NNW.

The next digit is a letter which represents the radial distance from the plant:

S = On-site location
A = 0-1 miles off-site
B = 1-2 miles off-site
C = 2-3 miles off-site
D = 3-4 miles off-site
E = 4-5 miles off-site
F = 5-10 miles off-site
G = 10-20 miles off-site
H = > 20 miles off-site

The last number is the station numerical designation within each sector and zone; e.g., 1,2,3. For example; the designation SA-WWA-3E1 would indicate a sample in the SGS and HCGS program (SA), consisting of well water (WWA), which had been collected in sector number 3, centered at 45 degrees (north east) with respect to the midpoint between SGS Units 1 and 2 at a radial distance of 4 to 5 miles off-site, (therefore, radial distance E). The number 1 indicated that this is sampling station number 1 in that particular sector.

TABLE A-1 **RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY**

SALEM GENERATING STATION **DOCKET NO. 50-272/-311**
HOPE CREEK GENERATING STATION **DOCKET NO. 50-354**

SALEM COUNTY, NEW JERSEY **REPORTING PERIOD: January 1, 2015 to December 31, 2015**

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED		LOWER LIMIT OF DETECTION (LLD)*	ALL INDICATOR LOCATIONS MEAN ** (RANGE)	LOCATION WITH HIGHEST MEAN NAME DISTANCE AND DIRECTION	MEAN** (RANGE)	CONTROL LOCATION MEAN** (RANGE)	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
I. AIRBORNE								
AIR PARTICULATE	GR-B	416	10	13 (359/364)	SA-APT-16E1	14 (50/52)	13 (52/52)	0
(E-3 pCi/m^3)				(4/31)	4.1 MILES NNW	(6/31)	(4/33)	
	GAMMA	32						
	BE-7		NA	111 (27/28)	SA-APT-7S1	124 (3/4)	100 (4/4)	0
				(65/157)	0.12 MILES SE	(94/146)	(75/116)	
	K-40		NA	<LLD		-	<LLD	0
	CS-134		50	<LLD		-	<LLD	0
	CS-137		60	<LLD		-	<LLD	0
AIR IODINE	GAMMA	416						
(E-3 pCi/m^3)	I-131		70	<LLD		-	<LLD	0
II. DIRECT								
DIRECT RADIATION	TLD-QUARTERLY	232	NA	14.1 (208/208)	SA-IDM-16S2	33.0 (4/4)	13.8 (24/24)	0
(mR/standard quarter)				(9.2/39.4)	0.6 MILES N OF SITE	(28.3/39.4)	(10.1/16.1)	
III. TERRESTRIAL								
MILK	I-131	80	1	<LLD		-	<LLD	0
(pCi/L)								
	GAMMA	80						
	K-40		NA	1331 (60/60)	SA-MLK-14F4	1374 (20/20)	1276 (20/20)	0
				(1133/1757)	7.6 MILES WNW	(1133/1757)	(1094/1480)	

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MILK (cont'd) (pCi/L)	CS-134		15	<LLD		-	<LLD	0
	CS-137		18	<LLD		-	<LLD	0
	BALA-140		15	<LLD		-	<LLD	0
	RA-226		NA	<LLD		-	<LLD	0
WELL WATER (pCi/L)	GR-A	12	3	<LLD		-	NA	0
	GR-B	12	4	2.5 (2/12) (2.2/2.7)	SA-WWA-3E1 4.2 MILES NE	2.7 (2/12) (2.2/2.7)	NA	0
	H-3	12	200	<LLD		-	NA	0
	I-131	12	1	<LLD		-	NA	0
	GAMMA K-40	12	NA	<LLD		-	NA	0
	MN-54		15	<LLD		-	NA	0
	CO-58		15	<LLD		-	NA	0

TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

SALEM GENERATING STATION
HOPE CREEK GENERATING STATION

DOCKET NO. 50-272/-311
DOCKET NO. 50-354

SALEM COUNTY, NEW JERSEY

REPORTING PERIOD: January 1, 2015 to December 31, 2015

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD)*	ALL INDICATOR LOCATIONS MEAN ** (RANGE)	LOCATION WITH HIGHEST MEAN NAME DISTANCE AND DIRECTION	MEAN** (RANGE)	CONTROL LOCATION MEAN** (RANGE)	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
	FE-59	30	<LLD		-	NA	0
WELL WATER (cont'd) (pCi/L)	CO-60	15	<LLD		-	NA	0
	ZN-65	30	<LLD		-	NA	0
	ZRNB-95	15	<LLD		-	NA	0
	CS-134	15	<LLD		-	NA	0
	CS-137	18	<LLD		-	NA	0
	BALA-140	15	<LLD		-	NA	0
	RA-226	NA	<LLD		-	NA	0
POTABLE WATER (pCi/L)	GR-A 24	3	<LLD		-	NA	0
	GR-B 24	4	5.2 (22/24) (3.1/7.8)	SA-PWT-2F3 8.0 MILES NNE	5.6 (22/24) (3.7/7.8)	NA	0
	H-3 24	200	<LLD		-	NA	0
	I-131 24	1	<LLD		-	NA	0

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POTABLE WATER (cont'd) (pCi/L)	GAMMA 24						
	K-40	NA	<LLD		-	NA	0
	MN-54	15	<LLD		-	NA	0
	CO-58	15	<LLD		-	NA	0
	FE-59	30	<LLD		-	NA	0
	CO-60	15	<LLD		-	NA	0
	ZN-65	30	<LLD		-	NA	0
	ZRNB-95	15	<LLD		-	NA	0
	I-131	10	<LLD		-	NA	0
	CS-134	15	<LLD		-	NA	0
	CS-137	18	<LLD		-	NA	0
	BALA-140	15	<LLD		-	NA	0

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SALEM COUNTY, NEW JERSEY

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POTABLE WATER (cont'd) (pCi/L)	RA-226	NA	<LLD		-	NA	0
VEGETATION (pCi/kg wet)	GAMMA 93						
	BE-7	NA	265 (1/81)	SA-FPV-1G1 C 10.9 MILES NNE	2634 (1/5)	2634 (1/12)	0
	K-40	NA	4079 (81/81) (1693/15380)	SA-FPV-14F4	15380 (1/1)	2411 (12/12) (1557/5576)	0
	I-131	60	<LLD		-	<LLD	0
	CS-134	60	<LLD		-	<LLD	0
	CS-137	80	<LLD		-	<LLD	0
	RA-226	NA	803 (1/81)	SA-FPL-1S1 0.57 MILES N	803 (1/78)	<LLD	0
	TH-232	NA	<LLD		-	<LLD	0
FODDER CROPS (pCi/kg wet)	GAMMA 4						
	BE-7	NA	<LLD		-	NA	0
	K-40	NA	3344.7 (3/3) (3152/3678)	SA-VGT-2G3 11.8 MILES NNE	3678 (1/1)	1491 (1/1)	0

TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

SALEM GENERATING STATION
HOPE CREEK GENERATING STATION

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DOCKET NO. 50-354

SALEM COUNTY, NEW JERSEY

REPORTING PERIOD: January 1, 2015 to December 31, 2015

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD)*	ALL INDICATOR LOCATIONS MEAN ** (RANGE)	LOCATION WITH HIGHEST MEAN NAME DISTANCE AND DIRECTION	MEAN** (RANGE)	CONTROL LOCATION MEAN** (RANGE)	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
	I-131	60	<LLD		-	<LLD	0
FODDER CROPS (cont'd) (pCi/kg wet)	CS-134	60	<LLD		-	<LLD	0
	CS-137	80	<LLD		-	<LLD	0
	RA-226	NA	<LLD		-	<LLD	0
	TH-232	NA	<LLD		-	<LLD	0
GAME (pCi/kg wet)	GAMMA	3					
	BE-7	NA	<LLD		-	NA	0
	K-40	NA	3048 (3/3) (2709/3555)	SA-GAM-5C1 3.14 MILES ENE	3555 (1/1)	NA	0
	I-131	60	<LLD		-	NA	0
	CS-134	60	<LLD		-	NA	0
	CS-137	80	<LLD		-	NA	0
SURFACE WATER (pCi/L)	H-3	60	200 242 (1/48)	SA-SWA-12C1 C 2.5 MILES WSW	257 (1/12)	257 (1/12)	0
	I-131	60	1 <LLD		-	<LLD	0

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SALEM COUNTY, NEW JERSEY **REPORTING PERIOD: January 1, 2015 to December 31, 2015**

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD)*	ALL INDICATOR LOCATIONS MEAN ** (RANGE)	LOCATION WITH HIGHEST MEAN NAME DISTANCE AND DIRECTION	MEAN** (RANGE)	CONTROL LOCATION MEAN** (RANGE)	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
SURFACE WATER (cont'd) (pCi/L)	GAMMA 60						
	K-40	NA	83 (26/48) (35/147)	SA-SWA-7E1 4.5 MILES SE	110 (8/12) (83/147)	99 (6/12) (43/167)	0
	MN-54	15	<LLD		-	<LLD	0
	CO-58	15	<LLD		-	<LLD	0
	FE-59	30	<LLD		-	<LLD	0
	CO-60	15	<LLD		-	<LLD	0
	ZN-65	30	<LLD		-	<LLD	0
	ZRNB-95	15	<LLD		-	<LLD	0
	CS-134	15	<LLD		-	<LLD	0
	CS-137	18	<LLD		-	<LLD	0
	BALA-140	15	<LLD		-	<LLD	0

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MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD)*	ALL INDICATOR LOCATIONS MEAN ** (RANGE)	LOCATION WITH HIGHEST MEAN NAME DISTANCE AND DIRECTION	MEAN** (RANGE)	CONTROL LOCATION MEAN** (RANGE)	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
FISH	GAMMA 12						
(pCi/kg wet)	K-40	NA	3949 (7/7) (3549/4512)	SA-ESF-12C1 C 2.5 MILES WSW	4428 (5/5) (3718/5145)	4428 (5/5) (3718/5145)	0
	MN-54	130	<LLD		-	<LLD	0
	CO-58	130	<LLD		-	<LLD	0
	FE-59	260	<LLD		-	<LLD	0
	CO-60	130	<LLD		-	<LLD	0
	ZN-65	260	<LLD		-	<LLD	0
	CS-134	130	<LLD		-	<LLD	0
	CS-137	150	<LLD		-	<LLD	0
	RA-226	NA	<LLD		-	<LLD	0
BLUE CRABS	GAMMA 4						
(pCi/kg wet)	K-40	NA	3450 (2/2) (3129/3771)	SA-ECH-11A1 0.2 MILES SW	3450 (2/2) (3129/3771)	3442 (2/2) (3015/3868)	0
	MN-54	130	<LLD		-	<LLD	0

TABLE A-1 RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

SALEM GENERATING STATION
HOPE CREEK GENERATING STATION

DOCKET NO. 50-272/-311
DOCKET NO. 50-354

SALEM COUNTY, NEW JERSEY

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MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD)*	ALL INDICATOR LOCATIONS MEAN ** (RANGE)	LOCATION WITH HIGHEST MEAN NAME DISTANCE AND DIRECTION	MEAN** (RANGE)	CONTROL LOCATION MEAN** (RANGE)	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
BLUE CRABS (cont'd) (pCi/kg wet)	CO-58	130	<LLD		-	<LLD	0
	FE-59	260	<LLD		-	<LLD	0
	CO-60	130	<LLD		-	<LLD	0
	ZN-65	260	<LLD		-	<LLD	0
	CS-134	130	<LLD		-	<LLD	0
	CS-137	150	<LLD		-	<LLD	0
	RA-226	NA	<LLD		-	<LLD	0
SEDIMENT (pCi/kg dry)	GAMMA 13						
	BE-7	NA	<LLD		-	<LLD	0
	K-40	NA	7405 (11/11) (2545/16840)	SA-ESS-7E1 4.5 MILES SE	13680 (2/2) (13530/13830)	13280 (2/2) (10070/16490)	0
	CS-134	150	<LLD		-	<LLD	0
	CS-137	180	<LLD		-	<LLD	0

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HOPE CREEK GENERATING STATION DOCKET NO. 50-354

SALEM COUNTY, NEW JERSEY REPORTING PERIOD: January 1, 2015 to December 31, 2015

MEDIUM OR PATHWAY SAMPLED (UNIT OF MEASUREMENT)	ANALYSIS AND TOTAL NUMBER OF ANALYSES PERFORMED	LOWER LIMIT OF DETECTION (LLD)*	ALL INDICATOR LOCATIONS MEAN ** (RANGE)	LOCATION WITH HIGHEST MEAN NAME DISTANCE AND DIRECTION	MEAN** (RANGE)	CONTROL LOCATION MEAN** (RANGE)	NUMBER OF NONROUTINE REPORTED MEASUREMENTS
SEDIMENT (cont'd) (pCi/kg dry)	RA-226	NA	2132 (2/11) (1615/2649)	SA-ESS-7E1 4.5 MILES SE	2132 (2/2) (1615/2649)	1385 (1/2)	0
	TH-232	NA	599 (10/11) (196/920)	SA-ESS-16F1 6.9 MILES NNW	818 (2/2) (715/920)	769 (2/2) (657/882)	0
OYSTERS (pCi/kg wet)	GAMMA	4					
	K-40	NA	1130 (1/2) (1130)	SA-EOY-7H1 19 MILES SE	1895 (2/2) (1510/2280)	1895 (2/2) (1510/2280)	0
	MN-54	130	<LLD				0
	CO-58	130	<LLD				0
	FE-59	260	<LLD				0
	CO-60	130	<LLD				0
	ZN-65	260	<LLD				0
	CS-134	130	<LLD				0
	CS-137	150	<LLD				0

* LLD LISTED IS THE LOWER LIMIT OF DETECTION WHICH WE ENDEAVORED TO ACHIEVE DURING THIS REPORTING PERIOD.
** MEAN CALCULATED USING VALUES ABOVE LLD ONLY. FRACTIONS OF MEASUREMENTS ABOVE LLD ARE IN PARENTHESES.

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APPENDIX B

SAMPLE DESIGNATION

AND

LOCATIONS

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TABLE B-1

SALEM AND HOPE CREEK GENERATING STATIONS' RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

(Program Overview)

EXPOSURE PATHWAY AND/OR SAMPLE	NUMBER OF REPRESENTATIVE SAMPLES AND SAMPLE LOCATIONS	SAMPLING AND COLLECTION FREQUENCY	TYPE/FREQUENCY* OF ANALYSIS
DIRECT RADIATION	Fifty-eight routine monitoring stations with two or more dosimeters placed as follows:	Quarterly	Gamma dose/ quarterly
Dosimeters (IDM)	An inner ring of stations, one in each land based meteorological sector in the general area of the SITE BOUNDARY.		
	An outer ring of stations, one in each land based meteorological sector in the 6-8 km (3.4 – 6.4 miles) range from the site ;(1) and		
	The balance of the stations placed in areas of special interest such as population centers, nearby residences, and schools and in six areas beyond 10 miles to serve as control stations.		

TABLE B-1 (cont'd)

SALEM AND HOPE CREEK GENERATING STATIONS' RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

EXPOSURE PATHWAY AND/OR SAMPLE	NUMBER OF REPRESENTATIVE SAMPLES AND SAMPLE LOCATIONS	SAMPLING AND COLLECTION FREQUENCY	TYPE/FREQUENCY* OF ANALYSIS
ATMOSPHERIC			
a. Air Particulate (APT)	3 samples from close to the Site Boundary: 5S1, 7S1, 16S1. One duplicate sample from close to the site boundary: 5S2. 3 Samples in different land based sectors: 1F1, 2F6, 5D1.	Continuous sampler operation with sample collection weekly or more frequently if required by dust loading	Gross Beta / weekly Gamma isotopic analysis / quarterly composite
b. Air Iodine (AIO)	1 Sample from the vicinity of a community having a highest annual average ground level D/Q: 16E1. 1 Sample from a control location; for example 15 - 30 km distant (9.3 - 18.6 miles) and in the least prevalent wind direction: 14G1.		Iodine-131 / weekly
3. TERRESTRIAL			
a. Milk (MLK)	Samples from milking animals in 3 locations within 5 km distance (3.1 miles) having the highest dose potential. If there are none, then 1 sample from milking animals in each of 3 areas between 5 - 8 km distant (3.1 - 5.0 miles) where doses are calculated to be greater than 1 mrem per yr: 13E3, 14F4, 2G3(2). 1 Sample from milking animals at a control location 15 - 30 km distant (9.3 - 18.6 miles): 3G1.	Semi-monthly (when animals are on pasture) Monthly (when animals are not on pasture)	Gamma scan / semi-monthly Iodine-131 / semi-monthly Gamma scan / monthly Iodine-131 / monthly

TABLE B-1 (cont'd)

SALEM AND HOPE CREEK GENERATING STATIONS' RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

EXPOSURE PATHWAY AND/OR SAMPLE	NUMBER OF REPRESENTATIVE SAMPLES AND SAMPLE LOCATIONS	SAMPLING AND COLLECTION FREQUENCY	TYPE/FREQUENCY* OF ANALYSIS
b. Well Water (Ground) (WWA)	Although wells in the vicinity of SGS/HCGS are not directly affected by plant operations so sampling is not required by SGS/HCGS ODCM, samples of 3E1 farm's well are collected as management audit samples.	Monthly	Gamma scan / monthly Gross alpha / monthly Gross beta / monthly Tritium / monthly
c. Potable Water (Drinking Water) (PWR, PWT)	Although no potable water samples are required as liquid effluents discharged from SGS/HCGS do not directly affect this pathway and it is not required by SGS/HCGS ODCM, one raw and one treated water sample from a public water supply (City of Salem Water and Sewer Department) are collected: 2F3 as management audit samples.	Monthly (composited weekly)	Gross alpha / monthly Gross beta / monthly Tritium / monthly Gamma scan / monthly Iodine-131 / monthly
d. Vegetables (FPL, FPV)	Although the Delaware River at the location of SGS/HCGS is a brackish water source and is not used for irrigation of food products and so sampling is not required by SGS/HCGS ODCM, samples of vegetables are collected as management audit samples from various locations during harvest: 2F9, 1G1, 2G2 and 3H5. In addition, broad leaf vegetation is collected from 10D1 and 1G1 as well as being planted & collected onsite (1S1, 7S1, 15S2, 16S1). This is in lieu of having a milk farm within 5 km (3.1 miles) of the Site(2).	Monthly (during growing season)	Gamma scan / on collection

TABLE B-1 (cont'd)

SALEM AND HOPE CREEK GENERATING STATIONS' RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

EXPOSURE PATHWAY AND/OR SAMPLE	NUMBER OF REPRESENTATIVE SAMPLES AND SAMPLE LOCATIONS	SAMPLING AND COLLECTION FREQUENCY	TYPE/FREQUENCY* OF ANALYSIS
e. Fodder Crops (VGT)	Although not required by SGS/HCGS ODCM, samples of crops normally used as cattle feed (silage) were collected from milk farms as management audit samples: 14F4, 3G1, 2G3, 13E3.	Annually (at harvest)	Gamma scan / on collection
f. Soil (SOL)	Although not required by SGS/HCGS ODCM, samples of soil are collected as management audit samples: 6S2, 2F9, 5F1, 10D1, 16E1, 13E3, 14F4, 2G3, 3G1 (no samples collected in 2015).	Every 3 years (2010-2013-2016)	Gamma scan / on collection
4. AQUATIC ENVIRONMENT			
a. Surface Water (SWA)	One sample upstream: 1F2. One sample downstream: 7E1. One sample outfall: 11A1. One sample cross-stream (mouth of Appoquinimink River): 12C1[(3)]. And an additional location in the Chesapeake & Delaware Canal: 16F1.	Semi-Monthly	Gamma scan / monthly Tritium / monthly**
b. Edible Fish (ESF)	One sample of each commercially and recreationally important species in vicinity of plant discharge area: 11A1. One sample of same species in area not influenced by plant discharge: 12C1[(3)], and an additional location downstream: 7E1.	Semi-annually	Gamma scan (flesh) / on collection

TABLE B-1 (cont'd)

SALEM AND HOPE CREEK GENERATING STATIONS' RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

EXPOSURE PATHWAY AND/OR SAMPLE	NUMBER OF REPRESENTATIVE SAMPLES AND SAMPLE LOCATIONS	SAMPLING AND COLLECTION FREQUENCY	TYPE/FREQUENCY* OF ANALYSIS
c. Blue Crabs (ECH)	One sample of each commercially and recreationally important species in vicinity of plant discharge area 11A1. One sample of same species in area not influenced by plant discharge 12C1[3].	Semi-annually	Gamma scan (flesh) /on collection
d. Sediment (ESS)	One sample from downstream area: 7E1. One sample from cross-stream area and control location: 12C1[3]. One sample from outfall area: 11A1. One sample from upstream, the C & D Canal: 16F1. One sample from shoreline area: 6S2. One sample from Cooling Tower Blowdown discharge: 15A1. One sample south storm drain discharge line: 16A1.	Semi-annually	Gamma scan / on collection

TABLE B-1 (cont'd)

SALEM AND HOPE CREEK GENERATING STATIONS' RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

EXPOSURE PATHWAY AND/OR SAMPLE	NUMBER OF REPRESENTATIVE SAMPLES AND SAMPLE LOCATIONS	SAMPLING AND COLLECTION FREQUENCY	TYPE/FREQUENCY* OF ANALYSIS
e. Oysters[4] (EOY)	One sample near plant discharge area (Hope Creek Oyster Bed Area, approximately 2 miles SE of Site) as a management audit sample One sample in area not influenced by plant discharge (Bennies Oyster Beds Area, approximately 19 miles SE of Site) as a management audit sample	Twice per year, once near start and once near end of NJ harvest season	Gamma scan (flesh and liquids) / on collection

* Except for Passive Dosimeters, the quarterly analysis is performed on a composite of individual samples collected during the quarter.
** Technical Specifications and ODCM require quarterly analysis but it was decided to analyze surface waters on a monthly basis for tritium as a program enhancement
(1) Range of 3.4 – 6.4 miles based on ODCM Appendix E REMP Sample Locations Table and Figures (20686360).
(2) While these milk locations are not within the 5 km range, they are the closest farms in the Site vicinity.
Since broad leaf vegetation is acceptable in lieu of milk collections, gardens were planted and harvested at four locations on Site (1S1, 7S1, 15S1, 16S1) and one in Delaware (10D1).
(3) Station 12C1 was made the operational control (1975) for aquatic samples since the physical characteristics of this station more closely resemble those of the outfall area than do those at the upstream location originally chosen. This is due to the distance from Liston Point, which is the boundary between the Delaware River and Delaware Bay. As discussed extensively in the SGS/HCGS Pre-operational reports, the sampling locations further upstream show significantly lower background levels due to estuarine tidal flow.
(4) Oysters were added to the REMP as a management audit sample in 2015. The oysters from the indicator location (7C1) are impacted by bacteria and are considered too small to be sold to the public. The oyster sample locations are not listed in the ODCM

TABLE B-2

SAMPLING LOCATIONS

Specific information about the individual sampling locations are given in Table B-1. Maps B-1 and B-2 show the locations of sampling stations with respect to the Site. A Portable Global Positioning System (GPS) was used to provide the coordinates of sampling locations.

All sample types are not required to be collected at all possible sites every year.

STATION CODE	STATION LOCATION	LATITUDINAL DEG. MIN.	LONGITUDINAL DEG. MIN.	MEDIA SAMPLED
1S1	0.55 mi. N side of road near ISFSI pad.	39 – 28.260	75 – 32.222	IDM, FPL
2S2	0.40 mi. NNE; lamp pole 65 near HC switch yard	39 – 28.98	75 – 32.10	IDM
2S4	0.60 mi. NNE; in the equipment laydown area	39 – 28.110	75 – 31.992	IDM
3S1	0.58 mi. NE; behind refrigeration building	39 – 28.140	75 – 31.678	IDM
4S1	0.60 mi. ENE; site access road near intersection to TB-02	39 – 28.023	75 – 31.544	IDM
5S1	0.86 mi. E; site access road	39 – 27.668	75 – 31.187	IDM, AIO, APT
5S2	0.86 mi. E; site access road, duplicate sample	39 – 27.668	75 – 31.187	AIO, APT
6S2	0.23mi. ESE; area around helicopter pad	39 – 27.719	75 – 31.912	IDM, ESS, SOL
7S1	0.12 mi. SE; station personnel gate	39 – 27.720	75 – 32.15	IDM, AIO, APT, FPL
8S1	0.12 mi. SSE; fuel oil storage	39 – 27.676	75 – 32.055	IDM
9S1	0.12 mi. S; fuel oil storage	39 – 27.636	75 – 32.091	IDM
10S1	0.14 mi. SSW; circulating water building	39 – 27.700	75 – 32.160	IDM
11S1	0.09 mi. SW; circulating water building	39 – 27.719	75 – 32.225	IDM
12S1	0.09 mi. WSW; outside security fence	39 – 27.756	75 – 32.236	IDM
13S1	0.09 mi. W; outside security fence	39 – 27.801	75 – 32.267	IDM
14S1	0.10 mi. NNW; outside security fence	39 – 27.893	75 – 32.280	IDM
15S1	0.57 mi. NW; near river and Hope Creek barge slip	39 – 28.161	75 – 32.525	IDM, FPV
15S2	0.59 mi. NW; near river and Hope Creek barge slip	39 – 28.12	75 – 32.32	IDM, AIO, APT, FPL
16S1	0.57 mi. NNW; on road near fuel oil storage tank	39 – 28.215	75 – 32.432	IDM, FPL
16S2	0.60 mi. NNW; near security firing range	39 – 28.16	75 – 32.17	IDM, FPL
16S3	1.0 mi. NNW; consolidated spoils facility	39 – 28.350	75 – 32.550	IDM
11A1	0.20 mi. SW; Salem outfall area	39 – 27.59	75 – 32.25	ESS, SWA, ECH, ESF
11A1A	0.15 mi. SE; Located in the plant barge slip area	39 – 27.41	75 – 32.02	Alternate SWA

TABLE B-2 (cont'd)
SAMPLING LOCATIONS

All sample types are not required to be collected at all possible sites every year (see Table B-2 for sample locations this year).

STATION CODE	STATION LOCATION	LATITUDINAL DEG. MIN.	LONGITUDINAL DEG. MIN.	MEDIA SAMPLED
15A1	0.65 mi. NW; Hope Creek outfall area	39 – 27.67	75 – 32.19	ESS
16A1	0.24 mi. NNW; South Storm Drain outfall	39 – 28.24	75 – 32.58	ESS
5C1	3.14 mi. ENE; site access road, near 5D1 air sampler	39 – 28.250	75 – 28.430	GAM
12C1	2.5 mi. WSW; West bank of Delaware River	39 – 27.22	75 – 34.08	ESS, SWA, ECH, ESF
12C1A	3.7 mi. WSW; Located at the tip of Augustine Beach Boat Ramp	39 – 30.17	75 – 34.48	Alternate SWA
4D2	3.7 mi. ENE; Alloway Creek Neck Road	39 – 29.292	75 – 28.175	IDM
5D1	3.5 mi. E; local farm along Salem/HC access road.	39 – 28.396	75 – 28.334	IDM, AIO, APT
10D1	3.9 mi. SSW; Taylor's Bridge Spur, DE	39 – 24.613	75 – 33.733	IDM, FPL, SOL
14D1	3.4 mi. WNW; Bay View, DE	39 – 29.26	75 – 35.521	IDM
15D1	3.8 mi NW; Route 9, Augustine Beach, DE	39 – 30.125	75 – 35.28	IDM
2E1	4.4 mi. NNE; local farm, NJ	39 – 31.380	75 – 30.428	IDM
3E1	4.2 mi. NE; local farm, NJ	39 – 30.098	75 – 28.646	IDM, WWA
7E1	4.5 mi. SE; River Bank 1.0 mi. W of Mad Horse Creek	39 – 25.08	75 – 28.64	ESS, SWA, ESF
7E1A	8.87 mi. SE; Located at the end of Bayside Road, NJ	39 – 22.57	75 – 24.24	Alternate SWA
11E2	5.0 mi. SW; Route 9, DE	39 – 24.328	75 – 35.546	IDM
12E1	4.4 mi. WSW; Thomas Landing, DE	39 – 26.862	75 – 36.968	IDM
13E1	4.2 mi. W; Diehl House Lab, DE	39 – 27.989	75 – 36.735	IDM
13E3	5.0 mi. W; local farm, DE	39 – 27.17	75 – 37.30	MLK, FPL, VGT, SOL
16E1	4.1 mi. NNW; Port Penn, DE	39 – 30.762	75 – 34.580	IDM, AIO, APT, SOL
1F1	5.8 mi. N; Fort Elfsborg, NJ	39 – 32.693	75 – 31.124	IDM, AIO, APT,
1F2	7.1 mi. N; midpoint of Delaware River	39 – 33.08	75 – 32.54	SWA
2F2	8.5 mi. NNE; Salem Substation, Salem NJ	39 – 34.522	75 – 28.120	IDM
2F3	8.0 mi. NNE; City of Salem Water and Sewage Department, NJ	39 – 33.40	75 – 27.18	PWR, PWT
2F5	7.4 mi. NNE; Salem High School, Salem, NJ	39 – 33.448	75 – 28.514	IDM
2F6	7.3 mi. NNE; PSE&G Training Center, Salem NJ	39 – 33.713	75 – 28.819	IDM, AIO, APT
2F9	7.5 mi. NNE; Local Farm , Tilbury Rd, Salem, NJ	39 – 33.55	75 – 29.30	FPV, SOL

TABLE B-2 (cont'd)
SAMPLING LOCATIONS

All sample types are not required to be collected at all possible sites every year (see Table B-2 for sample locations this year).

STATION CODE	STATION LOCATION	LATITUDINAL DEG. MIN.	LONGITUDINAL DEG. MIN.	MEDIA SAMPLED
2F10	9.2 mi. NNE; Local Farm, South Broadway (Rt 49) Pennsville, NJ	39 – 35.35	75 – 29.35	FPV, FPL
3F2	5.1 mi. NE; Hancocks Bridge, NJ Munc Bldg	39 – 30.410	75 – 27.578	IDM
3F3	8.6 mi. NE; Quinton Township Elem. School NJ	39 – 32.616	75 – 24.735	IDM
3F6	6.5 mi. NE; Local Farm, Salem/Hancocks Bridge Road, NJ	39 – 32.03	75 – 28.00	FPV
3F7	7.2 mi. NE; Local Farm, Beasley Neck Road, RD#3, NJ	39 – 32.07	75 – 25.46	FPV
3F8	9.3 mi. NE; Circle M Orchard, NJ	39 – 33.987	75 – 25.468	FPV
4F2	6.0 mi. ENE; Mays Lane, Harmersville, NJ	39 – 29.953	75 – 26.076	IDM
5F1	6.5 mi. E; Canton, NJ	39 – 28.360	75 – 25.031	IDM,SOL
6F1	6.4 mi. ESE; Stow Neck Road, NJ	39 – 26.396	75 – 25.148	IDM
7F2	9.1 mi. SE; Bayside, NJ	39 – 22.971	75 – 24.261	IDM
8F1	9.7 mi. SE; Woodland Beach, DE	39 – 19.933	75 – 28.463	IDM
9F1	5.3 mi. S; off Route #9, DE	39 – 23.042	75 – 32.95	IDM
10F2	5.8 mi. SSW; Route #9, DE	39 – 23.034	75 – 34.152	IDM
11F1	6.2 mi. SW; Taylor's Bridge, DE	39 – 24.766	75 – 37.632	IDM
12F1	9.4 mi. WSW; Townsend Elementary School, DE	39 – 23.778	75 – 41.311	IDM
13F2	6.5 mi W; Odessa, DE	39 – 27.297	75 – 39.372	IDM
13F3	9.3 mi. W; Redding Middle School, Middletown, DE	39 – 27.215	75 – 42.543	IDM
13F4	9.8 mi. W; Middletown, DE	39 – 26.857	75 – 43.111	IDM
14F2	6.7 mi. WNW; Route 13 and Boyds Corner Rd, DE	39 – 29.979	75 – 39.042	IDM
14F4	7.6 mi. WNW; local farm, DE	39 – 30.44	75 – 40.52	MLK, VGT, SOL
15F3	5.4 mi. NW, Port Penn Rd. at Pole Bridge Rd., DE	39 – 30.987	75 – 36.586	IDM
15F4	7.0 mi. NW; local farm; Port Penn Road; DE	39 – 31.21	75 – 38.31	FPV
16F1	6.9 mi. NNW; C&D Canal, DE	39 – 33.55	75 – 34.25	ESS, SWA
16F1A	6.84 mi. NNW; Located at the C&D Canal Tip, DE	39 – 33.34	75 – 33.56	Alternate SWA

TABLE B-2 (cont'd)
SAMPLING LOCATIONS

All sample types are not required to be collected at all possible sites every year (see Table B-2 for sample locations this year).

STATION CODE	STATION LOCATION	LATITUDINAL DEG. MIN.	LONGITUDINAL DEG. MIN.	MEDIA SAMPLED
16F2	8.1 mi. NNW; Delaware City Public School, DE	39 – 34.314	75 – 35.429	IDM
1G1	10.9 mi. NNE; Route 49, South Broadway, NJ	39 – 37.113	75 – 30.178	FPV
1G3	19 mi. N; N. Church Street Wilmington, DE	39 – 44.287	75 – 32.512	IDM
2G2	13.5 mi. NNE; Local Farm; Pointers Auburn Road (Route 540), Salem, NJ	39 – 38.19	75 – 26.10	FPV
2G3	11.8 mi. NNE; Local Milk Farm, NJ	39 – 36.21	75 – 24.53	MLK, VGT, SOL
2G4	11.3 mi. NNE; large family garden; Route 45 & Welchville Road, Mannington, NJ	39 – 36.02	75 – 25.21	FPV
3G1	17 mi. NE; local farm, NJ	39 – 35.913	75 – 16.804	IDM, MLK, VGT, SOL
9G1	10.3 mi. S; Local Farm, Woodland Beach Road., Smyrna, DE	39 – 18.47	75 – 33.50	FPV
9G2	10.7 mi. S; Local Farm, Woodland Beach Road, Smyrna, DE	39 – 18.39	75 – 34.11	FPV
10G1	12 mi. SSW; Smyrna, DE	39 – 18.223	75 – 36.095	IDM
14G1	11.8 mi. WNW; Route 286, Bethel Church Road, DE	39 – 31.290	75 – 46.495	AIO,APT,IDM
16G1	15 mi. NNW; Wilmington Airport, DE	39 – 40.637	75 – 35.570	IDM
3H1	32 mi. NE; National Park, NJ	39 – 51.599	75 – 11.96	IDM
3H5	25 mi. NE; Farm Market, Route 77, NJ	39 – 41.040	75 – 12.380	FPV
7C1*	2 mi SE; Hope Creek Bed, near mouth of Hope Creek	39 – 26.611	75 – 30.328	EOY
7H1*	19 mi SE; Bennies Oyster Bed, near Nantuxent Cove	39 – 15.500	75 – 17.500	EOY

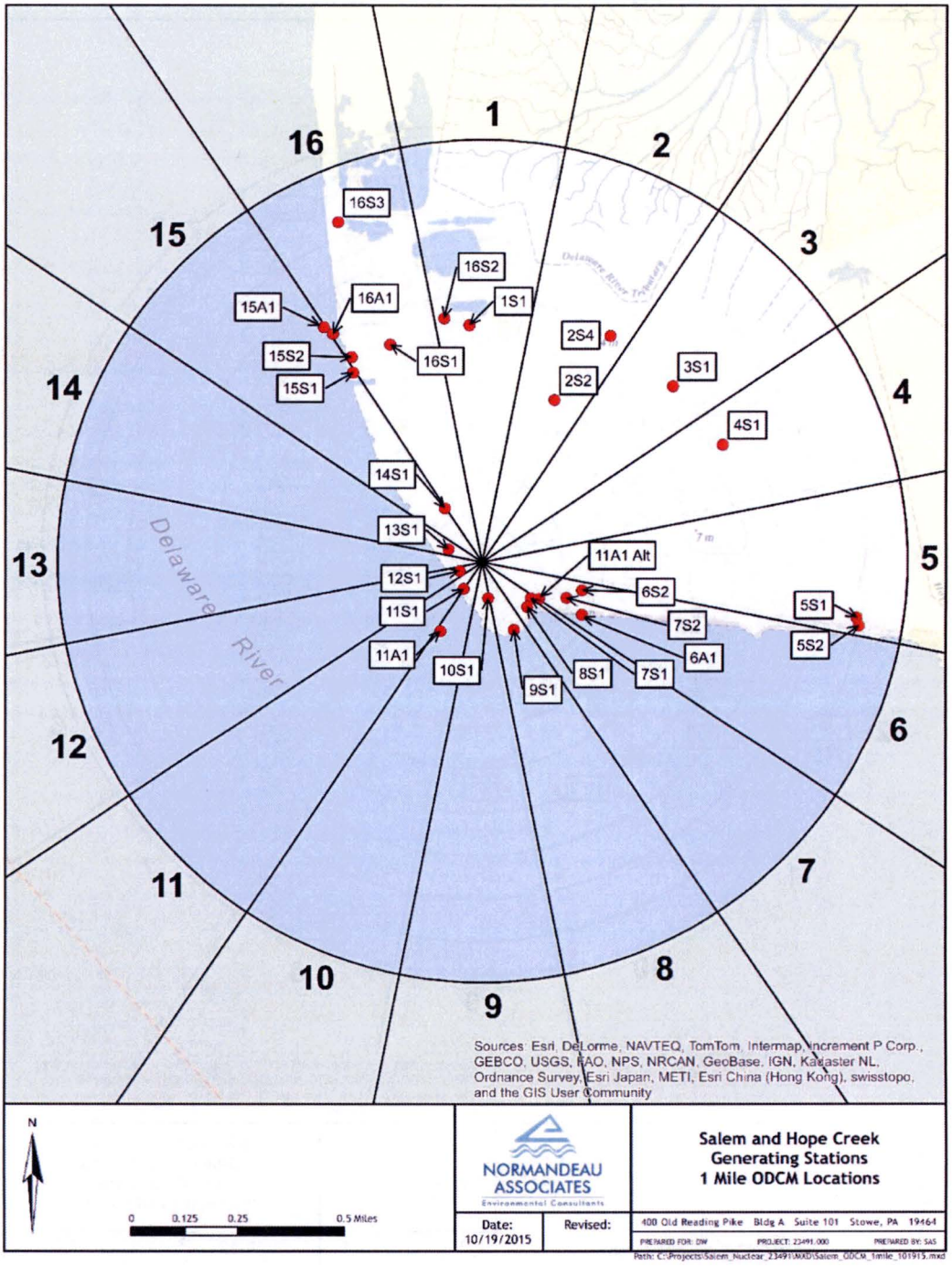
NOTE: All station locations are referenced to the midpoint of the two Salem Units' Containments. The coordinates of this location are: Latitude N 39° - 27' – 46.5" and Longitude W 75° - 32' – 10.6".

Vegetable samples are not always collected in consecutive years from the same farmer due to crop rotation.

* Oysters were added to the REMP as a management audit sample in 2015. The oysters from the indicator location (7C1) are impacted by bacteria and are considered too small to be sold to the public. The oyster sample locations are not listed in the ODCM.

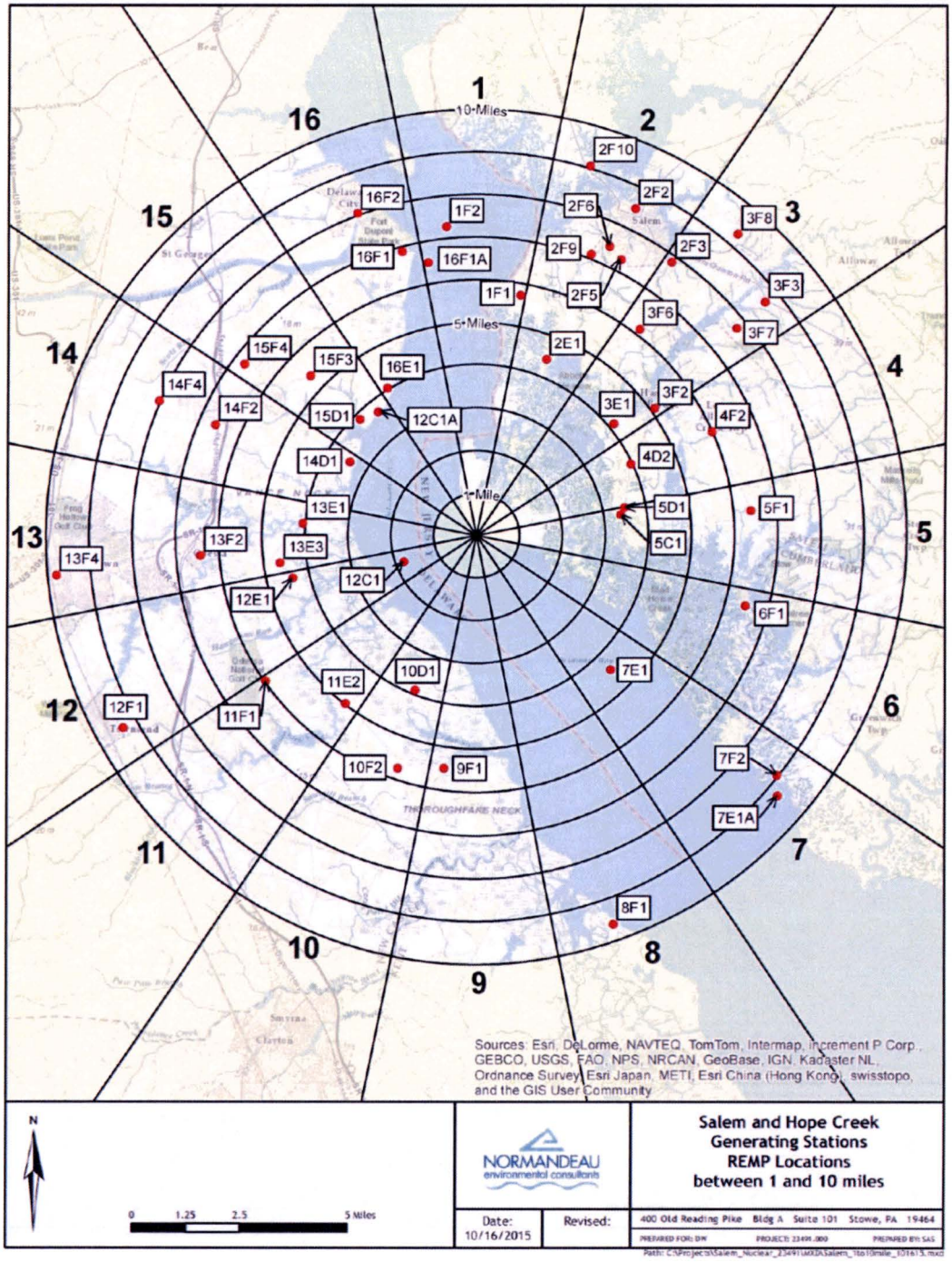
MAP B-1

SALEM AND HOPE CREEK GENERATING STATIONS' RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ON-SITE SAMPLING LOCATIONS OUT TO 1 MILE



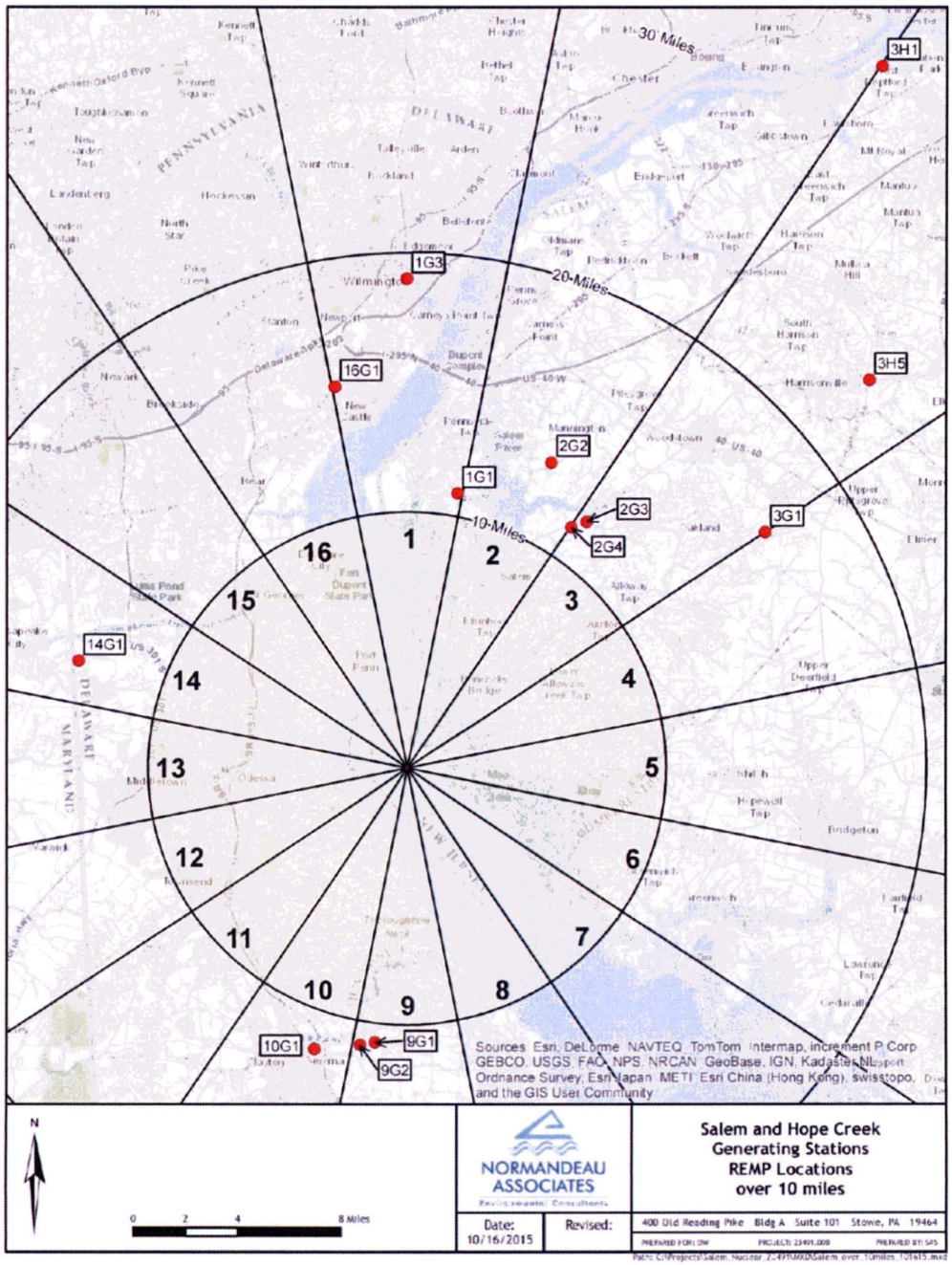
MAP B-2

SALEM AND HOPE CREEK GENERATING STATIONS' RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM OFF-SITE SAMPLING LOCATIONS 1 TO 10 MILES



MAP B-3

SALEM AND HOPE CREEK GENERATING STATIONS' RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM OFF-SITE SAMPLING LOCATIONS GREATER THAN 10 MILES



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APPENDIX C

DATA TABLES AND FIGURES

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TABLE C-1 CONCENTRATIONS OF GAMMA EMITTERS IN QUARTERLY COMPOSITES OF AIR PARTICULATES, 2015

Results in Units of 1E-3 pCi/m^3 ± 2 Sigma

STATION ID	COLLECTION PERIOD START		STOP	Be-7			K-40			Cs-134			Cs-137		
SA-APT-14G1 (C)	12/29/14	-	03/30/15	107	±	31	<	32		<	2		<	1
	03/30/15	-	06/29/15	101	±	37	<	23		<	1		<	2
	06/29/15	-	09/28/15	116	±	27	<	19		<	1		<	1
	09/28/15	-	12/28/15	75	±	25	<	26		<	1		<	1
			AVERAGE*	100	±	35		-			-			-
SA-APT-15S2	12/29/14	-	03/30/15	124	±	41	<	46		<	3		<	3
	03/30/15	-	06/29/15	129	±	41	<	32		<	2		<	2
	06/29/15	-	09/28/15	116	±	34	<	8		<	2		<	2
	09/28/15	-	12/28/15	123	±	32	<	34		<	2		<	2
			AVERAGE*	123	±	11		-			-			-
SA-APT-16E1	12/29/14	-	03/30/15	94	±	27	<	31		<	2		<	1
	03/30/15	-	06/29/15	146	±	39	<	36		<	2		<	2
	06/29/15	-	09/28/15	110	±	28	<	25		<	1		<	1
	09/28/15	-	12/28/15	65	±	28	<	43		<	2		<	2
			AVERAGE*	104	±	67		-			-			-
SA-APT-1F1	12/29/14	-	03/30/15	122	±	28	<	34		<	2		<	2
	03/30/15	-	06/29/15	107	±	35	<	40		<	2		<	2
	06/29/15	-	09/28/15	117	±	41	<	39		<	3		<	3
	09/28/15	-	12/28/15	92	±	27	<	31		<	2		<	1
			AVERAGE*	109	±	26		-			-			-
SA-APT-2F6	12/29/14	-	03/30/15	123	±	38	<	34		<	2		<	2
	03/30/15	-	06/29/15	116	±	43	<	44		<	2		<	2
	06/29/15	-	09/28/15	157	±	30	<	33		<	2		<	2
	09/28/15	-	12/28/15	65	±	21	<	22		<	2		<	1
			AVERAGE*	115	±	76		-			-			-
SA-APT-5D1	12/29/14	-	03/30/15	100	±	24	<	17		<	1		<	1
	03/30/15	-	06/29/15	132	±	37	<	32		<	2		<	3
	06/29/15	-	09/28/15	127	±	45	<	39		<	3		<	2
	09/28/15	-	12/28/15	90	±	29	<	22		<	2		<	1
			AVERAGE*	112	±	41		-			-			-

(C) CONTROL STATION

* THE AVERAGE AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES

TABLE C-1 CONCENTRATIONS OF GAMMA EMITTERS IN QUARTERLY COMPOSITES OF AIR PARTICULATES, 2015

Results in Units of 1E-3 pCi/m^3 ± 2 Sigma

STATION ID	COLLECTION PERIOD START		STOP	Be-7			K-40			Cs-134			Cs-137		
SA-APT-5S1	12/29/14	-	03/30/15	89	±	23	<	27		<	2		<	2	
	03/30/15	-	06/29/15	80	±	26	<	27		<	2		<	1	
	06/29/15	-	09/28/15	94	±	28	<	16		<	2		<	2	
	09/28/15	-	12/28/15	104	±	38	<	36		<	2		<	2	
			AVERAGE*	92	±	20		-			-			-	
SA-APT-7S1	12/29/14	-	03/30/15	94	±	39	<	36		<	2		<	2	
	03/30/15	-	06/29/15	131	±	36	<	23		<	2		<	2	
	06/29/15	-	09/28/15	146	±	29	<	29		<	2		<	1	
	09/28/15	-	12/28/15	< 51			<	44		<	2		<	3	
			AVERAGE*	124	±	27		-			-			-	

* THE AVERAGE AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES

TABLE C-2 CONCENTRATIONS OF GROSS BETA EMITTERS IN AIR PARTICULATES, 2015

Results in Units of 1E-3pCi/m^3 ± 2 Sigma

COLLECTION PERIOD		CONTROL	GROUP I				
START	STOP	SA-APT-14G1	SA-APT-1F1	SA-APT-2F6	SA-APT-5D1	SA-APT-5S1	SA-APT-7S1
12/29/14	- 01/05/15	14 ± 3	14 ± 3	17 ± 3	16 ± 3	10 ± 3	19 ± 3
01/05/15	- 01/12/15	9 ± 3	13 ± 3	15 ± 3	10 ± 3	15 ± 3	16 ± 3
01/12/15	- 01/19/15	14 ± 3	13 ± 3	14 ± 3	15 ± 3	11 ± 3	12 ± 3
01/19/15	- 01/26/15	9 ± 3	13 ± 3	5 ± 3	11 ± 3	9 ± 3	13 ± 3
01/26/15	- 02/02/15	14 ± 3	16 ± 3	14 ± 3	11 ± 3	11 ± 3	12 ± 3
02/02/15	- 02/09/15	18 ± 4	16 ± 3	15 ± 3	17 ± 3	17 ± 3	15 ± 3
02/09/15	- 02/17/15	14 ± 3	13 ± 3	14 ± 3	12 ± 3	15 ± 3	17 ± 3
02/17/15	- 02/23/15	17 ± 4	20 ± 4	23 ± 4	18 ± 4	20 ± 4	24 ± 4
02/23/15	- 03/02/15	19 ± 3	16 ± 3	18 ± 3	19 ± 3	19 ± 3	19 ± 3
03/02/15	- 03/09/15	10 ± 3	12 ± 3	18 ± 3	13 ± 3	14 ± 3	16 ± 3
03/09/15	- 03/16/15	8 ± 3	9 ± 3	11 ± 3	11 ± 3	11 ± 3	11 ± 3
03/16/15	- 03/23/15	14 ± 3	13 ± 3	11 ± 3	13 ± 3	11 ± 3	13 ± 3
03/23/15	- 03/30/15	13 ± 3	13 ± 3	15 ± 3	11 ± 3	14 ± 3	16 ± 3
03/30/15	- 04/06/15	11 ± 3	17 ± 3	10 ± 3	11 ± 3	12 ± 3	12 ± 3
04/06/15	- 04/13/15	5 ± 3	7 ± 3	7 ± 2	7 ± 3	7 ± 3	6 ± 3
04/13/15	- 04/20/15	13 ± 3	10 ± 3	13 ± 3	11 ± 3	11 ± 3	13 ± 3
04/20/15	- 04/27/15	9 ± 3	9 ± 3	6 ± 2	8 ± 2	6 ± 2	9 ± 3
04/27/15	- 05/04/15	4 ± 3	4 ± 2	6 ± 3	< 4	4 ± 2	4 ± 2
05/04/15	- 05/11/15	13 ± 3	12 ± 3	12 ± 3	11 ± 3	13 ± 3	12 ± 3
05/11/15	- 05/18/15	16 ± 3	14 ± 3	15 ± 3	12 ± 3	17 ± 3	13 ± 3
05/18/15	- 05/26/15	13 ± 3	12 ± 2	14 ± 3	15 ± 3	16 ± 3	15 ± 3
05/26/15	- 06/01/15	12 ± 3	11 ± 3	9 ± 3	10 ± 3	9 ± 3	11 ± 3
06/01/15	- 06/08/15	4 ± 2	< 4	5 ± 2	< 4	5 ± 3	5 ± 3
06/08/15	- 06/15/15	13 ± 3	12 ± 3	13 ± 3	14 ± 4	12 ± 3	11 ± 3
06/15/15	- 06/22/15	12 ± 3	11 ± 3	10 ± 3	9 ± 3	10 ± 3	12 ± 3
06/22/15	- 06/29/15	9 ± 3	12 ± 4	10 ± 3	8 ± 3	9 ± 3	6 ± 2
06/29/15	- 07/06/15	11 ± 3	12 ± 3	10 ± 3	12 ± 3	11 ± 3	11 ± 3
07/06/15	- 07/13/15	14 ± 3	10 ± 3	13 ± 3	12 ± 3	9 ± 3	13 ± 3
07/13/15	- 07/20/15	13 ± 3	10 ± 3	11 ± 3	12 ± 3	13 ± 3	10 ± 3
07/20/15	- 07/27/15	18 ± 3	12 ± 3	15 ± 3	13 ± 3	15 ± 3	16 ± 3
07/27/15	- 08/03/15	12 ± 3	16 ± 3	13 ± 3	13 ± 3	13 ± 3	15 ± 3
08/03/15	- 08/10/15	15 ± 3	14 ± 3	13 ± 3	11 ± 3	15 ± 3	14 ± 3
08/10/15	- 08/17/15	12 ± 3	12 ± 3	8 ± 3	13 ± 3	10 ± 3	11 ± 3
08/17/15	- 08/24/15	13 ± 3	14 ± 3	13 ± 3	17 ± 3	14 ± 3	11 ± 3
08/24/15	- 08/31/15	17 ± 3	13 ± 3	14 ± 3	16 ± 3	10 ± 3	14 ± 3
08/31/15	- 09/08/15	29 ± 4	27 ± 4	26 ± 4	29 ± 3	25 ± 4	24 ± 3
09/08/15	- 09/14/15	10 ± 3	9 ± 3	11 ± 3	12 ± 3	10 ± 3	11 ± 3
09/14/15	- 09/21/15	21 ± 3	22 ± 3	22 ± 3	26 ± 4	26 ± 4	24 ± 4
09/21/15	- 09/28/15	9 ± 3	9 ± 3	11 ± 3	11 ± 3	8 ± 3	10 ± 3
09/28/15	- 10/06/15	10 ± 2	8 ± 2	8 ± 2	11 ± 3	8 ± 2	7 ± 2
10/06/15	- 10/12/15	13 ± 3	10 ± 3	12 ± 3	7 ± 3	14 ± 3	11 ± 3
10/12/15	- 10/19/15	11 ± 3	10 ± 3	9 ± 3	8 ± 3	11 ± 3	10 ± 4
10/19/15	- 10/26/15	19 ± 3	8 ± 2	18 ± 3	13 ± 3	15 ± 3	18 ± 3
10/26/15	- 11/02/15	12 ± 3	19 ± 3	14 ± 3	14 ± 3	19 ± 3	14 ± 3
11/02/15	- 11/09/15	21 ± 4	19 ± 3	19 ± 3	11 ± 3	10 ± 3	15 ± 3
11/09/15	- 11/16/15	9 ± 3	9 ± 3	10 ± 3	8 ± 3	11 ± 3	9 ± 3
11/16/15	- 11/23/15	12 ± 3	13 ± 3	14 ± 3	12 ± 3	14 ± 3	12 ± 3
11/23/15	- 11/30/15	19 ± 3	15 ± 3	16 ± 3	17 ± 3	15 ± 3	14 ± 3
11/30/15	- 12/07/15	15 ± 3	11 ± 3	12 ± 3	15 ± 3	11 ± 3	17 ± 3
12/07/15	- 12/14/15	33 ± 5	22 ± 4	25 ± 4	28 ± 4	27 ± 4	27 ± 4
12/14/15	- 12/21/15	9 ± 3	10 ± 3	13 ± 3	13 ± 3	11 ± 3	10 ± 3
12/21/15	- 12/28/15	12 ± 3	11 ± 3	11 ± 3	13 ± 3	12 ± 3	8 ± 3
AVERAGE*		13 ± 11	13 ± 9	13 ± 10	13 ± 7	13 ± 10	13 ± 10

TABLE C-2 CONCENTRATIONS OF GROSS BETA EMITTERS IN AIR PARTICULATES, 2015

Results in Units of 1E-3pCi/m^3 ± 2 Sigma

COLLECTION PERIOD		GROUP I	
START	STOP	SA-APT-15S2	SA-APT-16E1
12/29/14	- 01/05/15	17 ± 3	18± 4
01/05/15	- 01/12/15	16 ± 3	17± 3
01/12/15	- 01/19/15	16 ± 3	14± 3
01/19/15	- 01/26/15	10 ± 3	11± 3
01/26/15	- 02/02/15	12 ± 3	13± 3
02/02/15	- 02/09/15	22 ± 4	18± 4
02/09/15	- 02/17/15	16 ± 3	16± 3
02/17/15	- 02/23/15	23 ± 4	26± 4
02/23/15	- 03/02/15	18 ± 3	18± 3
03/02/15	- 03/09/15	14 ± 3	18± 3
03/09/15	- 03/16/15	11 ± 3	8± 3
03/16/15	- 03/23/15	14 ± 3	13± 3
03/23/15	- 03/30/15	13 ± 3	16± 3
03/30/15	- 04/06/15	15 ± 5	14± 3
04/06/15	- 04/13/15	8 ± 3	8± 3
04/13/15	- 04/20/15	12 ± 4	12± 3
04/20/15	- 04/27/15	10 ± 3	6± 3
04/27/15	- 05/04/15	4 ± 2	< 3
05/04/15	- 05/11/15	16 ± 4	13± 3
05/11/15	- 05/18/15	13 ± 3	16± 3
05/18/15	- 05/26/15	11 ± 2	14± 3
05/26/15	- 06/01/15	11 ± 3	7± 3
06/01/15	- 06/08/15	5 ± 3	< 4
06/08/15	- 06/15/15	12 ± 3	10± 3
06/15/15	- 06/22/15	9 ± 3	12± 3
06/22/15	- 06/29/15	7 ± 3	7± 3
06/29/15	- 07/06/15	13 ± 3	11± 3
07/06/15	- 07/13/15	12 ± 3	11± 3
07/13/15	- 07/20/15	12 ± 3	10± 3
07/20/15	- 07/27/15	13 ± 3	14± 3
07/27/15	- 08/03/15	12 ± 3	16± 3
08/03/15	- 08/10/15	12 ± 3	11± 3
08/10/15	- 08/17/15	9 ± 3	11± 3
08/17/15	- 08/24/15	15 ± 3	12± 3
08/24/15	- 08/31/15	13 ± 3	15± 3
08/31/15	- 09/08/15	27 ± 4	31± 4
09/08/15	- 09/14/15	12 ± 4	13± 4
09/14/15	- 09/21/15	24 ± 4	25± 4
09/21/15	- 09/28/15	10 ± 3	10± 3
09/28/15	- 10/06/15	9 ± 3	11± 3
10/06/15	- 10/12/15	12 ± 3	12± 3
10/12/15	- 10/19/15	15 ± 4	12± 3
10/19/15	- 10/26/15	13 ± 3	12± 3
10/26/15	- 11/02/15	19 ± 3	15± 3
11/02/15	- 11/09/15	15 ± 3	20± 4
11/09/15	- 11/16/15	8 ± 3	8± 3
11/16/15	- 11/23/15	17 ± 3	17± 3
11/23/15	- 11/30/15	20 ± 3	19± 3
11/30/15	- 12/07/15	19 ± 4	14± 3
12/07/15	- 12/14/15	30 ± 4	30± 4
12/14/15	- 12/21/15	14 ± 3	10± 3
12/21/15	- 12/28/15	10 ± 3	11± 3
AVERAGE*		14 ± 11	14± 11

TABLE C-3 CONCENTRATIONS OF IODINE-131* IN FILTERED AIR, 2015

Results in Units of 1E-3pCi/m^3 ± 2 Sigma

COLLECTION PERIOD		CONTROL	GROUP I				
START	STOP	SA-AIO-14G1	SA-AIO-1F1	SA-AIO-2F6	SA-AIO-5D1	SA-AIO-5S1	SA-AIO-7S1
12/29/14	01/05/15	< 28	< 31	< 30	< 30	< 30	< 26
01/05/15	01/12/15	< 52	< 51	< 51	< 49	< 53	< 54
01/12/15	01/19/15	< 33	< 32	< 32	< 30	< 32	< 33
01/19/15	01/26/15	< 48	< 56	< 54	< 53	< 56	< 47
01/26/15	02/02/15	< 59	< 52	< 53	< 49	< 54	< 60
02/02/15	02/09/15	< 41	< 66	< 66	< 62	< 66	< 40
02/09/15	02/17/15	< 40	< 44	< 44	< 44	< 45	< 43
02/17/15	02/23/15	< 26	< 35	< 33	< 31	< 34	< 26
02/23/15	03/02/15	< 32	< 20	< 22	< 22	< 21	< 30
03/02/15	03/09/15	< 43	< 39	< 42	< 38	< 39	< 43
03/09/15	03/16/15	< 38	< 35	< 37	< 38	< 34	< 34
03/16/15	03/23/15	< 24	< 40	< 39	< 41	< 38	< 23
03/23/15	03/30/15	< 29	< 26	< 27	< 25	< 23	< 26
03/30/15	04/06/15	< 47	< 47	< 47	< 47	< 17	< 51
04/06/15	04/13/15	< 45	< 43	< 38	< 46	< 45	< 44
04/13/15	04/20/15	< 47	< 69	< 63	< 64	< 65	< 44
04/20/15	04/27/15	< 58	< 38	< 37	< 34	< 21	< 54
04/27/15	05/04/15	< 69	< 60	< 65	< 68	< 66	< 66
05/04/15	05/11/15	< 42	< 18	< 32	< 36	< 34	< 41
05/11/15	05/18/15	< 39	< 45	< 44	< 48	< 46	< 42
05/18/15	05/26/15	< 26	< 37	< 14	< 40	< 38	< 28
05/26/15	06/01/15	< 43	< 37	< 35	< 40	< 38	< 46
06/01/15	06/08/15	< 59	< 40	< 38	< 16	< 40	< 60
06/08/15	06/15/15	< 29	< 15	< 15	< 19	< 16	< 32
06/15/15	06/22/15	< 30	< 31	< 30	< 33	< 31	< 31
06/22/15	06/29/15	< 36	< 57	< 42	< 49	< 44	< 38
06/29/15	07/06/15	< 9	< 21	< 21	< 22	< 23	< 18
07/06/15	07/13/15	< 40	< 17	< 43	< 48	< 48	< 45
07/13/15	07/20/15	< 64	< 30	< 28	< 28	< 30	< 63
07/20/15	07/27/15	< 30	< 29	< 27	< 28	< 28	< 30
07/27/15	08/03/15	< 25	< 48	< 18	< 49	< 46	< 64
08/03/15	08/10/15	< 21	< 22	< 20	< 21	< 20	< 22
08/10/15	08/17/15	< 34	< 36	< 13	< 36	< 33	< 35
08/17/15	08/24/15	< 21	< 18	< 17	< 18	< 17	< 22
08/24/15	08/31/15	< 44	< 65	< 60	< 53	< 60	< 45
08/31/15	09/08/15	< 47	< 61	< 56	< 51	< 57	< 49
09/08/15	09/14/15	< 25	< 24	< 22	< 22	< 21	< 27
09/14/15	09/21/15	< 37	< 24	< 24	< 26	< 26	< 40
09/21/15	09/28/15	< 51	< 40	< 39	< 38	< 39	< 53
09/28/15	10/06/15	< 17	< 22	< 21	< 19	< 22	< 47
10/06/15	10/12/15	< 27	< 37	< 36	< 15	< 36	< 29
10/12/15	10/19/15	< 21	< 22	< 21	< 22	< 21	< 31
10/19/15	10/26/15	< 32	< 23	< 23	< 8	< 22	< 36
10/26/15	11/02/15	< 41	< 26	< 26	< 30	< 27	< 40
11/02/15	11/09/15	< 31	< 14	< 36	< 40	< 36	< 32
11/09/15	11/16/15	< 33	< 30	< 29	< 31	< 29	< 36
11/16/15	11/23/15	< 15	< 61	< 61	< 37	< 62	< 40
11/23/15	11/30/15	< 54	< 50	< 43	< 48	< 45	< 55
11/30/15	12/07/15	< 34	< 34	< 36	< 37	< 33	< 37
12/07/15	12/14/15	< 31	< 45	< 45	< 43	< 18	< 29
12/14/15	12/21/15	< 36	< 53	< 48	< 54	< 45	< 38
12/21/15	12/28/15	< 39	< 46	< 46	< 42	< 42	< 38
	AVERAGE	-	-	-	-	-	

* IODINE-131 RESULTS ARE CORRECTED FOR DECAY USING STOP DATE OF COLLECTION PERIOD & ANALYZED TO AN LLD OF 70E-3 pCi/m^3

TABLE C-3 CONCENTRATIONS OF IODINE-131* IN FILTERED AIR, 2015

Results in Units of 1E-3pCi/m^3 ± 2 Sigma

COLLECTION PERIOD START	STOP	GROUP I SA-AIO-15S2	SA-AIO-16E1
12/29/14	01/05/15	< 26	< 28
01/05/15	01/12/15	< 54	< 56
01/12/15	01/19/15	< 33	< 35
01/19/15	01/26/15	< 46	< 51
01/26/15	02/02/15	< 58	< 62
02/02/15	02/09/15	< 41	< 42
02/09/15	02/17/15	< 42	< 43
02/17/15	02/23/15	< 28	< 27
02/23/15	03/02/15	< 32	< 32
03/02/15	03/09/15	< 46	< 43
03/09/15	03/16/15	< 37	< 36
03/16/15	03/23/15	< 25	< 23
03/23/15	03/30/15	< 29	< 29
03/30/15	04/06/15	< 37	< 45
04/06/15	04/13/15	< 44	< 44
04/13/15	04/20/15	< 58	< 41
04/20/15	04/27/15	< 56	< 62
04/27/15	05/04/15	< 66	< 62
05/04/15	05/11/15	< 44	< 41
05/11/15	05/18/15	< 42	< 39
05/18/15	05/26/15	< 28	< 26
05/26/15	06/01/15	< 45	< 44
06/01/15	06/08/15	< 60	< 65
06/08/15	06/15/15	< 32	< 30
06/15/15	06/22/15	< 31	< 32
06/22/15	06/29/15	< 38	< 38
06/29/15	07/06/15	< 18	< 18
07/06/15	07/13/15	< 44	< 42
07/13/15	07/20/15	< 62	< 65
07/20/15	07/27/15	< 31	< 31
07/27/15	08/03/15	< 61	< 62
08/03/15	08/10/15	< 21	< 22
08/10/15	08/17/15	< 33	< 35
08/17/15	08/24/15	< 21	< 22
08/24/15	08/31/15	< 45	< 46
08/31/15	09/08/15	< 49	< 50
09/08/15	09/14/15	< 28	< 27
09/14/15	09/21/15	< 42	< 41
09/21/15	09/28/15	< 58	< 55
09/28/15	10/06/15	< 51	< 49
10/06/15	10/12/15	< 31	< 29
10/12/15	10/19/15	< 24	< 22
10/19/15	10/26/15	< 34	< 23
10/26/15	11/02/15	< 43	< 41
11/02/15	11/09/15	< 34	< 38
11/09/15	11/16/15	< 38	< 34
11/16/15	11/23/15	< 40	< 39
11/23/15	11/30/15	< 60	< 57
11/30/15	12/07/15	< 40	< 35
12/07/15	12/14/15	< 30	< 44
12/14/15	12/21/15	< 36	< 38
12/21/15	12/28/15	< 14	< 39
AVERAGE		-	-

* IODINE-131 RESULTS ARE CORRECTED FOR DECAY USING STOP DATE OF COLLECTION PERIOD & ANALYZED TO AN LLD OF 70E-3 pCi/m^3

TABLE C-4 DIRECT RADIATION MEASUREMENTS - QUARTERLY DOSIMITRY RESULTS*, 2015

Results in units of mR/standard quarter

STATION ID	ANNUAL DOSE mR/yr	JAN - MAR	APR - JUN	JUL - SEP	OCT - DEC
SA-IDM-1G3 (C)	56.3	15.0	14.1	13.2	14.0
SA-IDM-3G1 (C)	60.8	16.1	16.1	14.6	14.0
SA-IDM-10G1 (C)	57.2	14.5	13.6	14.8	14.3
SA-IDM-14G1 (C)	59.2	15.0	15.1	14.5	14.6
SA-IDM-16G1 (C)	51.4	13.0	13.1	12.7	12.6
SA-IDM-3H1 (C)	47.2	12.4	10.1	12.7	12.0
SA-IDM-1S1**	117.7	35.0	31.4	27.2	24.1
SA-IDM-2S2	54.0	15.2	13.1	13.7	12.0
SA-IDM-2S4	58.9	17.3	15.1	12.0	14.5
SA-IDM-3S1	46.1	12.4	10.6	11.0	12.1
SA-IDM-4S1	49.2	12.4	13.6	11.7	11.5
SA-IDM-5S1	47.5	13.4	11.1	12.0	11.0
SA-IDM-6S2	61.2	16.6	15.6	15.5	13.5
SA-IDM-7S1	50.6	14.5	13.6	11.4	11.1
SA-IDM-8S1	42.6	12.4	9.2	10.4	10.6
SA-IDM-9S1	44.3	12.4	10.1	10.6	11.2
SA-IDM-10S1	45.9	12.4	12.1	11.3	10.1
SA-IDM-11S1	41.6	11.8	10.1	10.1	9.6
SA-IDM-12S1	55.3	16.6	12.6	12.8	13.3
SA-IDM-13S1	59.9	18.2	13.6	13.7	14.4
SA-IDM-14S1	62.2	18.2	12.6	15.9	15.5
SA-IDM-15S1	45.6	12.9	11.1	11.3	10.3
SA-IDM-15S2	52.2	15.0	12.6	13.1	11.5
SA-IDM-16S1	55.2	14.5	14.1	14.1	12.5
SA-IDM-16S2**	131.8	39.4	33.9	30.2	28.3
SA-IDM-16S3	48.4	12.4	11.6	11.8	12.6
SA-IDM-4D2	57.6	15.5	14.1	14.8	13.2
SA-IDM-5D1	51.9	13.7	12.6	14.0	11.6
SA-IDM-10D1	57.9	14.5	15.1	14.8	13.5
SA-IDM-14D1	51.2	13.0	12.1	13.4	12.7
SA-IDM-15D1	62.8	15.9	15.1	15.4	16.4
SA-IDM-2E1	54.1	14.0	13.6	13.2	13.3
SA-IDM-3E1	46.4	11.7	11.1	11.4	12.2
SA-IDM-11E2	57.7	14.5	14.1	15.6	13.5
SA-IDM-12E1	59.2	15.5	15.1	14.7	13.9
SA-IDM-13E1	49.0	12.6	12.1	12.3	12.0
SA-IDM-16E1	54.2	14.8	12.1	14.2	13.1
SA-IDM-1F1	69.5	18.7	17.1	17.8	15.9
SA-IDM-2F2	50.3	15.0	11.6	12.0	11.7
SA-IDM-2F5	57.1	15.5	14.6	13.5	13.5
SA-IDM-2F6	53.5	14.5	13.1	12.8	13.1
SA-IDM-3F2	50.1	14.0	12.1	11.6	12.4
SA-IDM-3F3	50.3	13.4	12.1	12.0	12.8
SA-IDM-4F2	48.4	13.1	10.1	12.2	13.0
SA-IDM-5F1	50.9	13.6	11.6	12.7	13.0
SA-IDM-6F1	45.3	12.0	10.1	11.4	11.8
SA-IDM-7F2	51.0	14.0	11.3	12.8	12.9
SA-IDM-8F1	59.3	15.0	15.1	14.6	14.6
SA-IDM-9F1	63.9	18.0	16.1	15.6	14.2
SA-IDM-10F2	56.9	14.5	13.1	15.0	14.3
SA-IDM-11F1	60.4	14.5	16.1	15.3	14.5
SA-IDM-12F1	56.0	14.0	13.1	14.5	14.4
SA-IDM-13F2	54.7	14.0	13.1	13.9	13.7
SA-IDM-13F3	56.8	14.0	14.1	14.7	14.0
SA-IDM-13F4	58.9	15.5	14.1	14.7	14.6
SA-IDM-14F2	61.8	15.5	16.1	15.7	14.5
SA-IDM-15F3	60.9	15.5	14.6	15.7	15.1
SA-IDM-16F2	50.2	13.0	11.6	12.8	12.8

(C) CONTROL STATION
* QUARTERLY ELEMENT TLD RESULTS BY MIRION TECHNOLOGIES
** SAMPLE RESULTS ARE AFFECTED BY THE ISFSI, INDPENDENT SPENT FUEL STORAGE INSTALLATION

TABLE C-5 CONCENTRATIONS OF IODINE-131* AND GAMMA EMITTERS IN MILK, 2015

Results in units of pCi/L ± 2 sigma

	COLLECTION PERIOD			<---------GAMMA EMITTERS--------->				
STATION ID	START	STOP	I-131	K-40	Cs-134	Cs-137	BaLa-140	Ra-226
SA-MLK-3G1 (C)	01/04/15 -	01/05/15	< 0.5	1121 ± 159	< 8	< 9	< 15	< 167
SA-MLK-13E3	01/04/15 -	01/05/15	< 0.6	1392 ± 183	< 7	< 6	< 13	< 204
SA-MLK-14F4	01/04/15 -	01/05/15	< 0.5	1374 ± 137	< 5	< 7	< 9	< 146
SA-MLK-2G3	01/04/15 -	01/05/15	< 0.3	1228 ± 125	< 4	< 6	< 7	< 139
SA-MLK-3G1 (C)	02/01/15 -	02/02/15	< 0.5	1274 ± 143	< 5	< 6	< 9	< 122
SA-MLK-13E3	02/01/15 -	02/02/15	< 0.4	1400 ± 142	< 6	< 6	< 10	< 137
SA-MLK-14F4	02/01/15 -	02/02/15	< 0.5	1337 ± 101	< 4	< 4	< 6	< 104
SA-MLK-2G3	02/01/15 -	02/02/15	< 0.6	1312 ± 107	< 4	< 4	< 6	< 107
SA-MLK-3G1 (C)	03/01/15 -	03/02/15	< 0.5	1233 ± 156	< 9	< 10	< 12	< 265
SA-MLK-13E3	03/01/15 -	03/02/15	< 0.5	1176 ± 165	< 8	< 8	< 14	< 204
SA-MLK-14F4	03/01/15 -	03/02/15	< 0.8	1346 ± 184	< 8	< 8	< 12	< 186
SA-MLK-2G3	03/01/15 -	03/02/15	< 0.7	1283 ± 195	< 8	< 9	< 10	< 217
SA-MLK-3G1 (C)	04/05/15 -	04/06/15	< 0.4	1101 ± 161	< 6	< 7	< 11	< 174
SA-MLK-13E3	04/05/15 -	04/06/15	< 0.6	1365 ± 180	< 8	< 9	< 14	< 201
SA-MLK-14F4	04/05/15 -	04/06/15	< 0.3	1419 ± 160	< 7	< 8	< 10	< 185
SA-MLK-2G3	04/05/15 -	04/06/15	< 0.4	1376 ± 139	< 6	< 6	< 8	< 127
SA-MLK-3G1 (C)	04/26/15 -	04/27/15	< 0.3	1296 ± 153	< 5	< 6	< 13	< 123
SA-MLK-13E3	04/26/15 -	04/27/15	< 0.4	1413 ± 138	< 5	< 7	< 13	< 137
SA-MLK-14F4	04/26/15 -	04/27/15	< 0.3	1496 ± 157	< 5	< 6	< 9	< 136
SA-MLK-2G3	04/26/15 -	04/27/15	< 0.7	1210 ± 113	< 4	< 5	< 10	< 97
SA-MLK-3G1 (C)	05/10/15 -	05/11/15	< 0.8	1458 ± 155	< 6	< 5	< 10	< 157
SA-MLK-13E3	05/10/15 -	05/11/15	< 0.9	1250 ± 134	< 6	< 7	< 9	< 140
SA-MLK-14F4	05/10/15 -	05/11/15	< 0.6	1133 ± 196	< 5	< 7	< 14	< 151
SA-MLK-2G3	05/10/15 -	05/11/15	< 0.6	1298 ± 180	< 10	< 11	< 14	< 236
SA-MLK-3G1 (C)	05/25/15 -	05/26/15	< 0.3	1269 ± 137	< 2	< 3	< 6	< 52
SA-MLK-13E3	05/25/15 -	05/26/15	< 0.3	1179 ± 108	< 4	< 4	< 8	< 107
SA-MLK-14F4	05/25/15 -	05/26/15	< 0.3	1483 ± 111	< 4	< 4	< 9	< 106
SA-MLK-2G3	05/25/15 -	05/26/15	< 0.3	1388 ± 156	< 6	< 6	< 12	< 141
SA-MLK-3G1 (C)	06/07/15 -	06/08/15	< 0.7	1452 ± 137	< 5	< 5	< 6	< 143
SA-MLK-13E3	06/07/15 -	06/08/15	< 0.7	1240 ± 125	< 4	< 6	< 9	< 112
SA-MLK-14F4	06/07/15 -	06/08/15	< 0.6	1305 ± 125	< 5	< 6	< 8	< 140
SA-MLK-2G3	06/07/15 -	06/08/15	< 0.8	1277 ± 147	< 7	< 8	< 13	< 188
SA-MLK-3G1 (C)	06/21/15 -	06/22/15	< 0.5	1290 ± 182	< 6	< 8	< 12	< 157
SA-MLK-13E3	06/21/15 -	06/22/15	< 0.5	1616 ± 158	< 5	< 7	< 9	< 159
SA-MLK-14F4	06/21/15 -	06/22/15	< 0.5	1295 ± 168	< 7	< 9	< 13	< 209
SA-MLK-2G3	06/21/15 -	06/22/15	< 0.5	1601 ± 201	< 6	< 9	< 12	< 191

(C) CONTROL STATION

* IODINE-131 RESULTS ARE CORRECTED FOR DECAY TO STOP DATE OF COLLECTION PERIOD & ANALYZED TO AN LLD OF 1.0 pCi/L

TABLE C-5 CONCENTRATIONS OF IODINE-131* AND GAMMA EMITTERS IN MILK, 2015

Results in units of pCi/L ± 2 sigma

STATION ID	COLLECTION PERIOD START	STOP	I-131	<--------GAMMA EMITTERS--------> K-40	Cs-134	Cs-137	BaLa-140	Ra-226
SA-MLK-3G1(C)	07/05/15	07/06/15	< 0.5	1259 ± 130	< 5	< 4	< 6	< 111
SA-MLK-13E3	07/05/15	07/06/15	< 0.5	1421 ± 155	< 4	< 5	< 9	< 130
SA-MLK-14F4	07/05/15	07/06/15	< 0.5	1375 ± 120	< 5	< 5	< 6	< 137
SA-MLK-2G3	07/05/15	07/06/15	< 0.6	1280 ± 144	< 6	< 7	< 13	< 131
SA-MLK-3G1(C)	07/19/15	07/20/15	< 0.4	1243 ± 153	< 7	< 7	< 13	< 139
SA-MLK-13E3	07/19/15	07/20/15	< 0.4	1245 ± 174	< 6	< 7	< 12	< 188
SA-MLK-14F4	07/19/15	07/20/15	< 0.4	1319 ± 157	< 7	< 7	< 10	< 162
SA-MLK-2G3	07/19/15	07/20/15	< 0.5	1279 ± 147	< 7	< 6	< 12	< 167
SA-MLK-3G1(C)	08/02/15	08/03/15	< 0.4	1392 ± 187	< 7	< 8	< 12	< 162
SA-MLK-13E3	08/02/15	08/03/15	< 0.4	1314 ± 165	< 7	< 6	< 11	< 181
SA-MLK-14F4	08/02/15	08/03/15	< 0.4	1456 ± 177	< 7	< 10	< 8	< 223
SA-MLK-2G3	08/02/15	08/03/15	< 0.9	1283 ± 141	< 5	< 5	< 7	< 138
SA-MLK-3G1(C)	08/16/15	08/17/15	< 0.3	1283 ± 178	< 7	< 8	< 11	< 206
SA-MLK-13E3	08/16/15	08/17/15	< 0.4	1272 ± 195	< 9	< 11	< 14	< 212
SA-MLK-14F4	08/16/15	08/17/15	< 0.3	1475 ± 202	< 7	< 9	< 14	< 199
SA-MLK-2G3	08/16/15	08/17/15	< 0.4	1198 ± 213	< 9	< 9	< 11	< 225
SA-MLK-3G1(C)	09/07/15	09/08/15	< 0.4	1286 ± 252	< 7	< 8	< 11	< 206
SA-MLK-13E3	09/07/15	09/08/15	< 0.6	1312 ± 216	< 8	< 10	< 10	< 241
SA-MLK-14F4	09/07/15	09/08/15	< 0.6	1321 ± 194	< 7	< 9	< 11	< 164
SA-MLK-2G3	09/07/15	09/08/15	< 0.6	1194 ± 204	< 9	< 12	< 15	< 229
SA-MLK-3G1(C)	09/20/15	09/21/15	< 0.4	1162 ± 192	< 9	< 10	< 15	< 173
SA-MLK-13E3	09/20/15	09/21/15	< 0.3	1460 ± 176	< 8	< 7	< 10	< 196
SA-MLK-14F4	09/20/15	09/21/15	< 0.3	1368 ± 152	< 8	< 8	< 8	< 179
SA-MLK-2G3	09/20/15	09/21/15	< 0.4	1396 ± 187	< 7	< 7	< 7	< 185
SA-MLK-3G1(C)	10/05/15	10/06/15	< 0.7	1104 ± 189	< 7	< 11	< 14	< 213
SA-MLK-13E3	10/05/15	10/06/15	< 0.6	1198 ± 254	< 6	< 11	< 6	< 286
SA-MLK-14F4	10/05/15	10/06/15	< 0.6	1192 ± 231	< 13	< 10	< 14	< 310
SA-MLK-2G3	10/05/15	10/06/15	< 0.4	1284 ± 242	< 8	< 9	< 12	< 264
SA-MLK-3G1(C)	10/18/15	10/19/15	< 0.7	1094 ± 230	< 9	< 11	< 11	< 241
SA-MLK-13E3	10/18/15	10/19/15	< 0.9	1426 ± 212	< 8	< 9	< 11	< 234
SA-MLK-14F4	10/18/15	10/19/15	< 0.8	1308 ± 206	< 9	< 9	< 13	< 227
SA-MLK-2G3	10/18/15	10/19/15	< 1.0	1149 ± 181	< 8	< 8	< 7	< 166
SA-MLK-3G1(C)	11/01/15	11/02/15	< 0.7	1480 ± 222	< 10	< 8	< 12	< 272
SA-MLK-13E3	11/01/15	11/02/15	< 0.6	1471 ± 220	< 9	< 9	< 13	< 211
SA-MLK-14F4	11/01/15	11/02/15	< 0.8	1432 ± 194	< 6	< 8	< 13	< 191
SA-MLK-2G3	11/01/15	11/02/15	< 0.9	1259 ± 172	< 7	< 6	< 12	< 204
SA-MLK-3G1(C)	11/15/15	11/16/15	< 0.7	1451 ± 203	< 9	< 11	< 12	< 195
SA-MLK-13E3	11/15/15	11/16/15	< 0.9	1532 ± 178	< 7	< 7	< 5	< 169
SA-MLK-14F4	11/15/15	11/16/15	< 0.7	1757 ± 177	< 7	< 7	< 8	< 169
SA-MLK-2G3	11/15/15	11/16/15	< 0.6	1684 ± 219	< 7	< 9	< 9	< 225
SA-MLK-3G1(C)	12/06/15	12/07/15	< 0.5	1451 ± 203	< 9	< 11	< 12	< 195
SA-MLK-13E3	12/06/15	12/07/15	< 0.5	1485 ± 162	< 8	< 11	< 13	< 250
SA-MLK-14F4	12/06/15	12/07/15	< 0.5	1297 ± 238	< 11	< 10	< 14	< 263
SA-MLK-2G3	12/06/15	12/07/15	< 0.6	1271 ± 139	< 8	< 10	< 11	< 203
ANNUAL AVERAGE			-	1331 ± 260	-	-	-	-

* IODINE-131 RESULTS ARE CORRECTED FOR DECAY TO STOP DATE OF COLLECTION PERIOD & ANALYZED TO AN LLD OF 1.0 pCi/L

TABLE C-6 CONCENTRATIONS OF GROSS ALPHA AND GROSS BETA EMITTERS AND TRITIUM IN WELL WATER*, 2015

Results in units of pCi/liter ± 2 sigma

STATION ID	COLLECTION PERIOD				
SA-WWA-3E1	START	STOP	Gr-A	Gr-B	H-3
	01/19/15	01/19/15	< 2.6	< 2.7	< 170
	02/17/15	02/17/15	< 1.2	< 2.3	< 163
	03/25/15	03/25/15	< 0.8	< 2.5	< 174
	04/23/15	04/23/15	< 2.6	< 2.5	< 199
	05/11/15	05/11/15	< 1.7	2.8 ± 1.6	< 178
	06/22/15	06/22/15	< 0.7	< 2.2	< 169
	07/17/15	07/17/15	< 1.4	< 2.2	< 194
	08/24/15	08/24/15	< 2.5	< 2.5	< 185
	09/14/15	09/14/15	< 1.4	< 2.4	< 190
	10/28/15	10/28/15	< 2.9	< 2.5	< 187
	11/20/15	11/20/15	< 1.6	< 2.7	< 191
	12/09/15	12/09/15	< 2.7	2.7 ± 1.6	< 189
		AVERAGE**	-	2.7 ± 0.1	-

* MANAGEMENT AUDIT SAMPLE: NOT REQUIRED BY ODCM

** THE AVERAGE AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES

TABLE C-7 CONCENTRATIONS OF GAMMA EMITTERS IN WELL WATER*, 2015

Results in units of pCi/L ± 2 sigma

	COLLECTION PERIOD		<-------GAMMA EMITTERS------->											
STATION ID	START	STOP	I-131**	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	ZrNb-95	Cs-134	Cs-137	BaLa140	Ra-226
SA-WWA-3E1	01/19/15	01/19/15	< 0.2	< 107	< 5	< 4	< 9	< 5	< 9	< 5	< 4	< 5	< 6	< 132
	02/17/15	02/17/15	< 0.4	< 130	< 5	< 4	< 10	< 5	< 9	< 5	< 4	< 5	< 5	< 147
	03/25/15	03/25/15	< 0.5	< 31	< 4	< 4	< 8	< 4	< 8	< 4	< 3	< 4	< 8	< 72
	04/23/15	04/23/15	< 0.6	< 47	< 5	< 4	< 11	< 4	< 10	< 5	< 5	< 5	< 6	< 125
	05/11/15	05/11/15	< 0.3	< 94	< 7	< 6	< 14	< 4	< 9	< 5	< 6	< 6	< 10	< 148
	06/22/15	06/22/15	< 0.5	< 85	< 5	< 5	< 10	< 6	< 10	< 6	< 5	< 5	< 7	< 109
	07/17/15	07/17/15	< 0.5	< 67	< 3	< 4	< 7	< 3	< 7	< 4	< 3	< 4	< 7	< 90
	08/24/15	08/24/15	< 0.5	< 93	< 6	< 5	< 10	< 7	< 13	< 7	< 5	< 7	< 8	< 151
	09/14/15	09/14/15	< 0.7	< 32	< 10	< 8	< 16	< 7	< 16	< 6	< 5	< 7	< 13	< 176
	10/28/15	10/28/15	< 0.7	< 26	< 3	< 3	< 7	< 4	< 7	< 4	< 3	< 4	< 5	< 117
	11/20/15	11/20/15	< 0.5	< 108	< 5	< 4	< 9	< 4	< 10	< 6	< 4	< 4	< 6	< 126
	12/09/15	12/09/15	< 0.3	< 122	< 5	< 5	< 11	< 8	< 10	< 6	< 5	< 7	< 10	< 175
		AVERAGE**	-	-	-	-	-	-	-	-	-	-	-	-

* MANAGEMENT AUDIT SAMPLE: NOT REQUIRED BY ODCM

** THE AVERAGE AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES

TABLE C-8 CONCENTRATIONS OF GROSS ALPHA AND GROSS BETA EMITTERS AND TRITIUM IN RAW AND TREATED POTABLE WATER*, 2015

Results in units of pCi/L ± 2 sigma

STATION ID	COLLECTION PERIOD START	STOP	GR-A	GR-B	H-3
SA-PWR-2F3	12/29/14	02/02/15	< 1.8	5.0 ± 1.9	< 169
	02/02/15	03/02/15	< 3.0	3.6 ± 1.9	< 195
	03/02/15	03/31/15	< 1.0	7.6 ± 2.1	< 185
	03/31/15	04/30/15	< 1.2	5.0 ± 1.8	< 180
	04/30/15	06/01/15	< 1.7	3.4 ± 1.9	< 165
	06/01/15	06/29/15	< 1.3	< 2.5	< 169
	06/29/15	07/31/15	< 2.1	5.7 ± 1.9	< 184
	07/31/15	08/31/15	< 2.0	3.8 ± 2.1	< 194
	08/31/15	09/30/15	< 2.3	3.1 ± 1.7	< 189
	09/30/15	10/30/15	< 1.3	6.4 ± 1.4	< 183
	10/30/15	11/30/15	< 2.4	4.4 ± 1.9	< 192
	11/30/15	01/04/16	< 2.0	4.3 ± 1.7	< 192
	AVERAGE**		-	4.7 ± 2.7	-
SA-PWT-2F3	12/29/14	02/02/15	< 1.8	6.8 ± 2.0	< 167
	02/02/15	03/02/15	< 2.8	5.8 ± 2.0	< 191
	03/02/15	03/31/15	< 1.0	7.8 ± 2.1	< 184
	03/31/15	04/30/15	< 1.3	5.1 ± 1.9	< 183
	04/30/15	06/01/15	< 1.7	6.3 ± 2.1	< 172
	06/01/15	06/29/15	< 1.3	5.1 ± 2.0	< 168
	06/29/15	07/31/15	< 2.2	5.6 ± 2.0	< 181
	07/31/15	08/31/15	< 2.1	5.9 ± 2.3	< 190
	08/31/15	09/30/15	< 2.3	3.7 ± 1.7	< 193
	09/30/15	10/30/15	< 1.3	4.8 ± 1.3	< 180
	10/30/15	11/30/15	< 2.5	4.2 + 2.0	< 188
	11/30/15	01/04/16	< 1.9	< 2.2	< 193
	AVERAGE**		-	5.6 ± 2.4	-

* MANAGEMENT AUDIT SAMPLE: NOT REQUIRED BY ODCM

** THE AVERAGE AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES

TABLE C-9 CONCENTRATIONS OF IODINE-131** AND GAMMA EMITTERS IN RAW AND TREATED POTABLE WATER, 2015*

Results in units of pCi/L ± 2 sigma

	COLLECTION PERIOD				<——GAMMA EMITTERS——>										
STATION ID	START	STOP	I-131	K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	ZrNb-95	Cs-134	Cs-137	BaLa-140	Ra-226
SA-PWR-2F3	12/29/14	02/02/15	< 0.3	< 68	< 4	< 5	< 8	< 3	< 8	< 5	< 5	< 4	< 7	< 135
SA-PWT-2F3	12/29/14	02/02/15	< 0.5	< 73	< 4	< 4	< 9	< 5	< 8	< 4	< 3	< 4	< 7	< 99
SA-PWR-2F3	02/02/15	03/02/15	< 0.4	< 22	< 3	< 3	< 8	< 3	< 7	< 4	< 4	< 4	< 6	< 89
SA-PWT-2F3	02/02/15	03/02/15	< 0.5	< 107	< 5	< 5	< 12	< 6	< 13	< 5	< 5	< 6	< 10	< 97
SA-PWR-2F3	03/02/15	03/31/15	< 0.4	< 46	< 5	< 4	< 9	< 4	< 9	< 4	< 4	< 5	< 6	< 113
SA-PWT-2F3	03/02/15	03/31/15	< 0.4	< 100	< 5	< 6	< 10	< 5	< 11	< 5	< 5	< 5	< 6	< 139
SA-PWR-2F3	03/31/15	04/30/15	< 0.3	< 47	< 2	< 2	< 5	< 2	< 4	< 2	< 2	< 2	< 5	< 56
SA-PWT-2F3	03/31/15	04/30/15	< 0.2	< 17	< 2	< 2	< 5	< 2	< 4	< 2	< 2	< 2	< 5	< 45
SA-PWR-2F3	04/30/15	06/01/15	< 0.5	< 41	< 2	< 2	< 5	< 2	< 5	< 3	< 2	< 3	< 4	< 57
SA-PWT-2F3	04/30/15	06/01/15	< 0.4	< 42	< 5	< 4	< 11	< 4	< 11	< 6	< 5	< 5	< 8	< 121
SA-PWR-2F3	06/01/15	06/29/15	< 0.4	< 31	< 3	< 3	< 7	< 3	< 6	< 3	< 3	< 3	< 8	< 83
SA-PWT-2F3	06/01/15	06/29/15	< 0.3	< 23	< 2	< 3	< 6	< 3	< 5	< 3	< 2	< 2	< 6	< 61
SA-PWR-2F3	06/29/15	07/31/15	< 0.3	< 24	< 2	< 3	< 5	< 3	< 5	< 3	< 2	< 2	< 5	< 52
SA-PWT-2F3	06/29/15	07/31/15	< 0.2	< 58	< 2	< 3	< 5	< 2	< 5	< 3	< 3	< 3	< 6	< 75
SA-PWR-2F3	07/31/15	08/31/15	< 0.5	< 123	< 7	< 5	< 12	< 7	< 17	< 6	< 5	< 6	< 8	< 178
SA-PWT-2F3	07/31/15	08/31/15	< 0.5	< 63	< 6	< 5	< 14	< 6	< 17	< 7	< 7	< 7	< 7	< 187
SA-PWR-2F3	08/31/15	09/30/15	< 0.5	< 133	< 5	< 6	< 10	< 5	< 9	< 5	< 6	< 8	< 7	< 156
SA-PWT-2F3	08/31/15	09/30/15	< 0.7	< 43	< 6	< 5	< 11	< 6	< 10	< 6	< 5	< 5	< 9	< 150
SA-PWR-2F3	09/30/15	10/30/15	< 0.6	< 93	< 4	< 5	< 8	< 4	< 10	< 5	< 5	< 5	< 7	< 126
SA-PWT-2F3	09/30/15	10/30/15	< 0.5	< 56	< 6	< 6	< 14	< 7	< 13	< 6	< 5	< 6	< 11	< 107
SA-PWR-2F3	10/30/15	11/30/15	< 0.7	< 140	< 9	< 8	< 13	< 9	< 12	< 7	< 6	< 7	< 10	< 174
SA-PWT-2F3	10/30/15	11/30/15	< 0.8	< 135	< 6	< 5	< 14	< 8	< 16	< 7	< 7	< 7	< 8	< 190
SA-PWR-2F3	11/30/15	01/04/16	< 0.5	< 87	< 5	< 4	< 10	< 6	< 11	< 6	< 5	< 6	< 8	< 143
SA-PWT-2F3	11/30/15	01/04/16	< 0.5	< 40	< 4	< 4	< 9	< 4	< 9	< 4	< 3	< 4	< 7	< 97
AVERAGE			-	-	-	-	-	-	-	-	-	-	-	-

* MANAGEMENT AUDIT SAMPLE: NOT REQUIRED BY ODCM

** IODINE-131 RESULTS ARE CORRECTED FOR DECAY TO STOP DATE OF COLLECTION PERIOD & ANALYZED TO AN LLD OF 1.0 pCi/L.

TABLE C-10 CONCENTRATIONS OF GAMMA EMITTERS IN VEGETABLES, 2015

Results in units of pCi/L ± 2 sigma

STATION ID	COLLECTION PERIOD	SAMPLE TYPE	<----------GAMMA EMITTERS----------> Be-7	K-40	I-131	Cs-134	Cs-137	Ra-226	Th-232
SA-FPV-2F9*	04/27/15	Asparagus	< 71	3785 ± 168	< 30	< 7	< 7	< 205	< 28
	AVERAGE**			3785 ± 0					
SA-FPV-1G1(C)*	05/03/15	Asparagus	< 48	2880 ± 144	< 14	< 5	< 6	< 119	< 17
SA-FPV-2G2(C)*	05/10/15	Asparagus	< 93	2289 ± 178	< 34	< 10	< 11	< 213	< 39
	AVERAGE**			2585 ± 836					
SA-FPL-3H5(C)*	07/22/15	Cabbage	< 123	2052 ± 306	< 26	< 14	< 15	< 322	< 66
SA-FPV-1G1(C)*	07/22/15	Corn	2634 ± 399	5576 ± 659	< 45	< 20	< 27	< 632	< 111
SA-FPV-1G1(C)*	07/22/15	Peppers	< 130	1645 ± 291	< 25	< 15	< 16	< 343	< 67
SA-FPV-1G1(C)*	07/22/15	Tomatoes	< 134	2471 ± 317	< 25	< 16	< 15	< 421	< 56
SA-FPL-10D1	07/15/15	Cabbage	< 209	3604 ± 461	< 38	< 22	< 24	< 523	< 84
SA-FPL-10D1	07/15/15	Collards	< 139	4568 ± 386	< 26	< 14	< 13	< 284	< 62
SA-FPL-10D1	07/15/15	Kohlrabi	< 245	3155 ± 503	< 54	< 24	< 23	< 650	< 100
SA-FPL-15S2*	07/15/15	Cabbage	< 237	4174 ± 504	< 38	< 23	< 23	< 402	< 99
SA-FPL-15S2*	07/15/15	Collards	< 222	5556 ± 631	< 49	< 20	< 28	< 520	< 102
SA-FPL-15S2*	07/15/15	Kohlrabi	< 175	3885 ± 394	< 28	< 15	< 16	< 381	< 64
SA-FPL-16S1	07/15/15	Cabbage	< 166	3738 ± 406	< 32	< 22	< 19	< 489	< 82
SA-FPL-16S1	07/15/15	Collards	< 239	4899 ± 541	< 43	< 19	< 22	< 431	< 103
SA-FPL-1S1	07/15/15	Cabbage	< 152	2677 ± 354	< 28	< 17	< 18	< 366	< 73
SA-FPL-1S1	07/15/15	Collards	< 136	3138 ± 422	< 25	< 15	< 17	< 309	< 71
SA-FPL-1S1	07/15/15	Kohlrabi	< 129	4993 ± 349	< 29	< 15	< 16	< 279	< 65
SA-FPL-7S2*	07/15/15	Cabbage	< 147	6075 ± 480	< 26	< 14	< 17	< 297	< 60
SA-FPL-7S2*	07/15/15	Collards	< 174	8225 ± 550	< 35	< 20	< 20	< 487	< 90
SA-FPL-7S2*	07/15/15	Kohlrabi	265 ± 161	8631 ± 590	< 36	< 21	< 23	< 440	< 96
SA-FPL-1G1*	07/22/15	Cabbage	< 123	2612 ± 355	< 25	< 14	< 14	< 344	< 65
SA-FPV-2F9*	07/22/15	Corn	< 134	2707 ± 368	< 30	< 16	< 19	< 360	< 70
SA-FPV-2F9*	07/22/15	Peaches	< 134	1805 ± 265	< 27	< 14	< 18	< 330	< 58
SA-FPV-2F9*	07/22/15	Tomatoes	< 129	2497 ± 275	< 27	< 15	< 15	< 351	< 61

* MANAGEMENT AUDIT SAMPLE: NOT REQUIRED BY ODCM

** THE AVERAGE AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES

(C) CONTROL STATION

TABLE C-10 CONCENTRATIONS OF GAMMA EMITTERS IN VEGETABLES, 2015

Results in units of pCi/L ± 2 sigma

STATION ID	COLLECTION PERIOD	SAMPLE TYPE	<----------GAMMA EMITTERS---------->						
			Be-7	K-40	I-131	Cs-134	Cs-137	Ra-226	Th-232
SA-FPL-3H5(C)*	07/22/15	Peppers	< 133	2016 ± 315	< 21	< 12	< 14	< 383	< 65
SA-FPL-3H5(C)*	07/22/15	Corn	< 176	2542 ± 445	< 33	< 17	< 18	< 504	< 85
SA-FPL-3H5(C)*	07/22/15	Tomatoes	< 200	2356 ± 340	< 41	< 26	< 25	< 485	< 99
SA-FPV-3F8*	07/22/15	Peach	< 102	1835 ± 220	< 19	< 11	< 12	< 247	< 43
	AVERAGE**		1450 ± 91	3993 ± 3770					
SA-FPV-2G2(C)*	08/05/15	Tomatoes	< 39	1669 ± 96	< 20	< 4	< 4	< 78	< 16
SA-FPV-2G2(C)*	08/05/15	Peppers	< 53	1557 ± 107	< 27	< 5	< 6	< 106	< 23
SA-FPV-2G2(C)*	08/05/15	Corn	< 43	1878 ± 100	< 22	< 4	< 4	< 92	< 16
SA-FPV-15F4*	08/05/15	Tomatoes	< 51	2119 ± 122	< 25	< 5	< 5	< 115	< 21
SA-FPV-15F4*	08/05/15	Peppers	< 41	2081 ± 105	< 21	< 4	< 4	< 102	< 18
SA-FPV-15F4*	08/05/15	Corn	< 49	2527 ± 115	< 25	< 5	< 5	< 109	< 19
SA-FPL-10D1	08/31/15	Cabbage	< 163	2910 ± 405	< 30	< 15	< 17	< 339	< 62
SA-FPL-10D1	08/31/15	Collards	< 309	3415 ± 694	< 58	< 29	< 31	< 627	< 104
SA-FPL-10D1	08/31/15	Kohlrabi	< 256	3041 ± 461	< 54	< 24	< 25	< 551	< 110
SA-FPL-15S2*	08/31/15	Cabbage	< 266	4466 ± 578	< 51	< 25	< 31	< 549	< 108
SA-FPL-15S2*	08/31/15	Collards	< 282	5935 ± 587	< 57	< 31	< 34	< 662	< 127
SA-FPL-15S2*	08/31/15	Kohlrabi	< 187	3710 ± 505	< 44	< 18	< 25	< 434	< 81
SA-FPL-16S1	08/31/15	Cabbage	< 243	2784 ± 526	< 46	< 23	< 23	< 573	< 79
SA-FPL-16S1	08/31/15	Collards	< 192	4486 ± 528	< 35	< 17	< 21	< 418	< 72
SA-FPL-16S1	08/31/15	Kohlrabi	< 249	3908 ± 582	< 55	< 26	< 31	< 604	< 115
SA-FPL-1S1	08/31/15	Cabbage	< 212	2383 ± 413	< 47	< 23	< 25	< 570	< 84
SA-FPL-1S1	08/31/15	Collards	< 272	3783 ± 631	< 53	< 25	< 30	803 ± 451	< 112
SA-FPL-1S1	08/31/15	Kohlrabi	< 235	3528 ± 439	< 52	< 23	< 27	< 577	< 103
SA-FPL-7S2*	08/31/15	Cabbage	< 201	4854 ± 486	< 43	< 24	< 27	< 474	< 106
SA-FPL-7S2*	08/31/15	Collards	< 269	8472 ± 688	< 54	< 23	< 29	< 582	< 123
SA-FPL-7S2*	08/31/15	Kohlrabi	< 232	8500 ± 652	< 53	< 26	< 30	< 711	< 114
	AVERAGE**			4050 ± 3802				803 ± 0	

* MANAGEMENT AUDIT SAMPLE: NOT REQUIRED BY ODCM

** THE AVERAGE AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES

(C) CONTROL STATION

TABLE C-10 CONCENTRATIONS OF GAMMA EMITTERS IN VEGETABLES, 2015

Results in units of pCi/L ± 2 sigma

STATION ID	COLLECTION PERIOD	SAMPLE TYPE	<----------GAMMA EMITTERS----------> Be-7	K-40	I-131	Cs-134	Cs-137	Ra-226	Th-232
SA-FPL-10D1	09/30/15	Cabbage	< 294	2383± 561	< 56	< 31	< 35	< 705	< 126
SA-FPL-10D1	09/30/15	Collards	< 278	4256± 670	< 54	< 35	< 34	< 755	< 130
SA-FPL-10D1	09/30/15	Kohlrabi	< 199	3060± 478	< 32	< 17	< 21	< 509	< 82
SA-FPL-15S2*	09/30/15	Cabbage	< 245	3615± 516	< 51	< 25	< 31	< 661	< 107
SA-FPL-15S2*	09/30/15	Collards	< 265	5365± 776	< 55	< 25	< 34	< 702	< 141
SA-FPL-15S2*	09/30/15	Kohlrabi	< 235	4078± 577	< 38	< 19	< 24	< 582	< 90
SA-FPL-16S1	09/30/15	Cabbage	< 346	3047± 601	< 56	< 30	< 32	< 772	< 110
SA-FPL-16S1	09/30/15	Collards	< 258	3616± 653	< 46	< 28	< 34	< 747	< 128
SA-FPL-1S1	09/30/15	Cabbage	< 196	2290± 341	< 38	< 22	< 22	< 531	< 86
SA-FPL-1S1	09/30/15	Collards	< 336	4548± 781	< 54	< 30	< 34	< 886	< 154
SA-FPL-1S1	09/30/15	Kohlrabi	< 172	4661± 401	< 30	< 17	< 20	< 417	< 101
SA-FPL-7S2*	09/30/15	Cabbage	< 205	3299± 563	< 44	< 23	< 26	< 667	< 117
SA-FPL-7S2*	09/30/15	Collards	< 290	5798± 793	< 58	< 37	< 39	< 804	< 126
SA-FPL-7S2*	09/30/15	Kohlrabi	< 222	3931± 551	< 46	< 31	< 29	< 670	< 103
	AVERAGE**			3853± 2055					
SA-FPV-14F4*	10/17/15	Soy Beans	< 144	15380± 731	< 24	< 15	< 19	< 359	< 81
SA-FPL-10D1	10/28/15	Cabbage	< 128	2285± 328	< 28	< 15	< 19	< 368	< 72
SA-FPL-10D1	10/28/15	Collards	< 203	3075± 487	< 43	< 21	< 28	< 523	< 93
SA-FPL-10D1	10/28/15	Kohlrabi	< 324	4319± 630	< 57	< 34	< 30	< 616	< 128
SA-FPL-15S2*	10/28/15	Cabbage	< 284	4625± 585	< 51	< 26	< 34	< 653	< 112
SA-FPL-15S2*	10/28/15	Kohlrabi	< 143	3267± 436	< 25	< 14	< 15	< 407	< 45
SA-FPL-16S1	10/28/15	Cabbage	< 208	2316± 451	< 31	< 19	< 19	< 507	< 57
SA-FPL-16S1	10/28/15	Collards	< 221	3007± 435	< 42	< 23	< 22	< 567	< 96
SA-FPL-16S1	10/28/15	Kohlrabi	< 207	5754± 484	< 42	< 23	< 24	< 462	< 97
SA-FPL-1S1	10/28/15	Cabbage	< 192	1917± 345	< 39	< 19	< 21	< 482	< 84
SA-FPL-1S1	10/28/15	Collards	< 193	3247± 404	< 39	< 17	< 20	< 504	< 79
SA-FPL-1S1	10/28/15	Kohlrabi	< 95	3474± 241	< 17	< 8	< 9	< 237	< 53
SA-FPL-7S2*	10/28/15	Cabbage	< 185	4081± 545	< 32	< 19	< 24	< 377	< 79
SA-FPL-7S2*	10/28/15	Collards	< 228	5497± 633	< 43	< 22	< 25	< 529	< 116
SA-FPL-7S2*	10/28/15	Kohlrabi	< 135	4694± 423	< 30	< 13	< 16	< 366	< 72
	AVERAGE**			4463± 6457					

* MANAGEMENT AUDIT SAMPLE: NOT REQUIRED BY ODCM

** THE AVERAGE AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES

(C) CONTROL STATION

TABLE C-10 CONCENTRATIONS OF GAMMA EMITTERS IN VEGETABLES, 2015

Results in units of pCi/L ± 2 sigma

STATION ID	COLLECTION PERIOD	SAMPLE TYPE	<————GAMMA EMITTERS————>						
			Be-7	K-40	I-131	Cs-134	Cs-137	Ra-226	Th-232
SA-FPV-1F1*	11/04/15	Soy beans	< 145	12750 ± 668	< 26	< 16	< 20	< 317	< 85
SA-FPL-10D1	11/30/15	Cabbage	< 309	1693 ± 523	< 60	< 30	< 26	< 590	< 125
SA-FPL-10D1	11/30/15	Collards	< 303	3122 ± 510	< 58	< 34	< 33	< 871	< 142
SA-FPL-10D1	11/30/15	Kohlrabi	< 240	2424 ± 451	< 43	< 23	< 26	< 477	< 99
SA-FPL-15S2*	11/30/15	Cabbage	< 266	4226 ± 636	< 55	< 31	< 33	< 652	< 119
SA-FPL-15S2*	11/30/15	Kohlrabi	< 194	2805 ± 369	< 36	< 20	< 22	< 523	< 77
SA-FPL-16S1	11/30/15	Collards	< 235	3953 ± 643	< 53	< 30	< 28	< 691	< 113
SA-FPL-16S1	11/30/15	Kohlrabi	< 221	4669 ± 427	< 40	< 25	< 26	< 444	< 111
SA-FPL-1S1	11/30/15	Cabbage	< 313	1927 ± 493	< 50	< 28	< 31	< 790	< 138
SA-FPL-1S1	11/30/15	Collards	< 348	3641 ± 737	< 59	< 37	< 35	< 996	< 175
SA-FPL-1S1	11/30/15	Kohlrabi	< 229	2344 ± 474	< 42	< 25	< 26	< 579	< 105
SA-FPL-7S2*	11/30/15	Cabbage	< 331	2937 ± 624	< 50	< 35	< 36	< 748	< 108
SA-FPL-7S2*	11/30/15	Collards	< 383	4641 ± 851	< 54	< 29	< 31	< 766	< 140
SA-FPL-7S2*	11/30/15	Kohlrabi	< 288	2909 ± 512	< 55	< 32	< 28	< 730	< 143
	AVERAGE**			3860 ± 5455					

* MANAGEMENT AUDIT SAMPLE: NOT REQUIRED BY ODCM

** THE AVERAGE AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES

(C) CONTROL STATION

TABLE C-11 **CONCENTRATIONS OF GAMMA EMITTERS IN FODDER CROPS*, 2015**

Results in units of pCi/kg (wet) ± 2 sigma

STATION ID	COLLECTION DATE	SAMPLE TYPE	<————GAMMA EMITTERS————>						
			Be-7	K-40	I-131	Cs-134	Cs-137	Ra-226	Th-232
SA-VGT-3G1 (C)	12/23/15	Silage	< 173	1491 ± 315	< 46	< 12	< 18	< 425	< 67
SA-VGT-13E3	12/23/15	Silage	< 221	3152 ± 420	< 60	< 16	< 19	< 421	< 62
SA-VGT-14F4	12/23/15	Silage	< 197	3204 ± 442	< 47	< 15	< 18	< 431	< 57
SA-VGT-2G3	12/28/15	Silage	< 207	3678 ± 437	< 36	< 19	< 18	< 434	< 78
	AVERAGE**			2881 ± 1913	-	-	-	-	-

(C) CONTROL STATION

* MANAGEMENT AUDIT SAMPLE: NOT REQUIRED BY ODCM

** THE AVERAGE AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES

TABLE C-12 **CONCENTRATIONS OF GAMMA EMITTERS IN SOIL**

Soil is sampled every three years. Last collection date was in 2013.
Next collection date is due in 2016.

TABLE C-13 CONCENTRATIONS OF GAMMA EMITTERS IN GAME*, 2015

Results in units of pCi/kg (wet) ± 2 sigma

STATION ID	COLLECTION DATE	SAMPLE TYPE	<----------GAMMA EMITTERS---------->				
			Be-7	I-131	K-40	Cs-134	Cs-137
SA-GAM-13E3	02/01/15	Muskrat	< 96	< 56	2879 ± 233	< 8	< 8
SA-GAM-3E1	02/13/15	Muskrat	< 68	< 17	2709 ± 240	< 7	< 10
SA-GAM-5C1	01/21/2015	Muskrat	< 64	< 12	3555 ± 193	< 7	< 8
	AVERAGE**		-	-	3048 ± 895	-	-

* MANAGEMENT AUDIT SAMPLE: NOT REQUIRED BY ODCM

** THE AVERAGE AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES

TABLE C-14 CONCENTRATIONS OF TRITIUM IN SURFACE WATER, 2015

Results in Units of pCi/L ± 2 sigma

COLLECTION PERIOD		CONTROL	INDICATOR			
START	STOP	SA-SWA-12C1 (C)	SA-SWA-11A1	SA-SWA-16F1	SA-SWA-1F2	SA-SWA-7E1
01/06/15	01/06/15	< 174	< 177	< 175	< 176	< 178
02/04/15	02/04/15	< 159	< 190	< 161	< 162	< 160
03/04/15	03/04/15	< 184	< 186	< 183	< 187	< 186
04/09/15	04/09/15	< 189	< 175	< 174	< 177	< 171
05/04/15	05/04/15	< 170	< 174	< 175	< 174	< 169
06/04/15	06/04/15	< 183	< 183	< 183	< 183	< 180
07/09/15	07/21/15	< 183	< 184	< 189	< 183	< 187
08/06/15	08/19/15	< 179	< 190	< 182	< 182	< 181
09/11/15	09/23/15	< 191	< 190	< 189	< 191	< 189
10/06/15	10/19/15	257 ± 126	< 190	< 186	< 189	< 189
11/02/15	11/24/15	< 189	< 188	< 188	< 187	242 ± 125
12/07/15	12/22/15	< 185	< 184	< 182	< 182	< 186
	AVERAGE**	257 ± 126				242 ± 125

(C) CONTROL STATION

** THE AVERAGE AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES

TABLE C-15 CONCENTRATIONS OF I-131 AND GAMMA EMITTERS IN SURFACE WATER, 2015

Results in Units of pCi/L ± 2 Sigma

STATION ID	COLLECTION PERIOD	I-131*	<——GAMMA EMITTERS——> K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	ZrNb-95	Cs-134	Cs-137	BaLa-140
SA-SWA-16F1	01/06/2015	< 0.4	35 ± 22	< 1	< 1	< 3	< 1	< 3	< 1	< 1	< 1	< 3
	02/04/2015	< 0.5	62 ± 39	< 2	< 2	< 5	< 2	< 4	< 2	< 2	< 2	< 5
	03/04/2015	< 0.8	90 ± 56	< 3	< 4	< 8	< 4	< 8	< 4	< 3	< 4	< 4
	04/09/15	< 0.3	< 15	< 2	< 2	< 4	< 2	< 3	< 2	< 1	< 2	< 4
	05/04/15	< 0.6	39 ± 22	< 2	< 2	< 4	< 2	< 4	< 2	< 2	< 2	< 5
	06/04/15	< 0.4	< 62	< 6	< 6	< 13	< 5	< 12	< 6	< 6	< 6	< 10
	07/09/15	< 0.6	44 ± 27	< 2	< 2	< 4	< 2	< 3	< 2	< 2	< 2	< 4
	08/06/15	< 0.8	< 35	< 4	< 4	< 9	< 4	< 8	< 5	< 4	< 5	< 7
	09/11/15	< 0.4	60 ± 28	< 2	< 2	< 4	< 2	< 4	< 2	< 2	< 2	< 4
	10/06/15	< 0.7	< 67	< 5	< 5	< 11	< 6	< 12	< 6	< 5	< 6	< 8
	11/02/15	< 0.9	< 36	< 4	< 4	< 6	< 3	< 8	< 4	< 4	< 4	< 6
	12/07/15	< 0.6	41 ± 13	< 1	< 1	< 2	< 1	< 1	< 1	< 1	< 1	< 2
	AVERAGE**	-	53 ± 38	-	-	-	-	-	-	-	-	-
SA-SWA-1F2	01/06/2015	< 0.5	< 25	< 3	< 3	< 6	< 3	< 5	< 3	< 2	< 3	< 6
	02/04/2015	< 0.7	42 ± 25	< 2	< 2	< 4	< 2	< 3	< 2	< 1	< 2	< 4
	03/04/2015	< 0.6	< 33	< 4	< 5	< 8	< 5	< 8	< 5	< 4	< 5	< 10
	04/09/15	< 0.4	< 12	< 1	< 1	< 3	< 1	< 2	< 1	< 1	< 1	< 3
	05/04/15	< 0.7	81 ± 30	< 1	< 1	< 3	< 2	< 3	< 2	< 1	< 1	< 4
	06/04/15	< 0.4	< 35	< 4	< 4	< 10	< 4	< 8	< 5	< 4	< 4	< 6
	07/09/15	< 0.6	< 17	< 2	< 2	< 4	< 2	< 4	< 2	< 2	< 2	< 4
	08/06/15	< 0.7	< 23	< 3	< 4	< 9	< 3	< 6	< 4	< 4	< 4	< 6
	09/11/15	< 0.5	< 24	< 2	< 2	< 6	< 2	< 5	< 2	< 2	< 2	< 6
	10/06/15	< 0.9	< 46	< 4	< 5	< 8	< 3	< 12	< 5	< 5	< 6	< 9
	11/02/15	< 0.7	< 44	< 4	< 4	< 8	< 4	< 8	< 4	< 4	< 4	< 7
	12/07/15	< 0.5	< 11	< 1	< 1	< 3	< 1	< 3	< 1	< 1	< 1	< 3
	AVERAGE**	-	61 ± 56	-	-	-	-	-	-	-	-	-

* IODINE-131 RESULTS ARE CORRECTED FOR DECAY TO STOP DATE OF COLLECTION AND ANALYZED TO AN LLD OF 1.0 pCi/L
** THE AVERAGE AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES

TABLE C-15 CONCENTRATIONS OF I-131 AND GAMMA EMITTERS IN SURFACE WATER, 2015

Results in Units of pCi/L ± 2 Sigma

STATION ID	COLLECTION PERIOD	I-131*	<————GAMMA EMITTERS————> K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	ZrNb-95	Cs-134	Cs-137	BaLa-140
SA-SWA-7E1	01/06/15	< 0.5	83 ± 33	< 2	< 2	< 5	< 2	< 4	< 2	< 2	< 2	< 5
	02/04/15	< 0.6	104 ± 28	< 2	< 2	< 5	< 2	< 4	< 2	< 2	< 2	< 5
	03/04/15	< 0.7	< 38	< 3	< 4	< 7	< 3	< 6	< 4	< 4	< 4	< 6
	04/09/15	< 0.4	93 ± 31	< 2	< 2	< 5	< 2	< 4	< 2	< 2	< 2	< 5
	05/04/15	< 0.7	91 ± 59	< 3	< 3	< 6	< 3	< 5	< 3	< 3	< 3	< 6
	06/04/15	< 0.5	< 51	< 6	< 6	< 12	< 6	< 12	< 6	< 6	< 7	< 9
	07/09/15	< 0.6	< 18	< 2	< 2	< 4	< 2	< 4	< 2	< 2	< 2	< 4
	08/06/15	< 0.8	123 ± 64	< 4	< 4	< 7	< 4	< 8	< 5	< 4	< 4	< 8
	09/11/15	< 0.5	147 ± 35	< 2	< 2	< 5	< 2	< 4	< 2	< 2	< 2	< 5
	10/06/15	< 0.7	132 ± 56	< 4	< 3	< 8	< 4	< 9	< 4	< 5	< 5	< 7
	11/02/15	< 0.9	< 32	< 4	< 4	< 7	< 3	< 7	< 4	< 4	< 4	< 8
	12/07/15	< 0.5	110 ± 15	< 1	< 1	< 2	< 1	< 1	< 1	< 1	< 1	< 2
	AVERAGE**	-	110 ± 44	-	-	-	-	-	-	-	-	-

* IODINE-131 RESULTS ARE CORRECTED FOR DECAY TO STOP DATE OF COLLECTION AND ANALYZED TO AN LLD OF 1.0 pCi/L
** THE AVERAGE AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES

TABLE C-16 CONCENTRATIONS OF GAMMA EMITTERS IN EDIBLE FISH, 2015

Results in Units of pCi/kg (wet) ± 2 sigma

STATION ID	COLLECTION PERIOD	<——GAMMA EMITTERS——> K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Cs-134	Cs-137	Ra-226
SA-ESF-12C1 (C)	04/27/15	3718 ± 812	< 49	< 53	< 114	< 53	< 97	< 54	< 52	< 1072
	04/27/15	5145 ± 998	< 55	< 57	< 135	< 52	< 120	< 50	< 58	< 1352
	09/29/15	4467 ± 988	< 34	< 91	< 136	< 53	< 105	< 42	< 56	< 857
	09/30/15	4463 ± 973	< 79	< 97	< 257	< 63	< 177	< 69	< 65	< 1150
	11/05/15	4346 ± 876	< 70	< 77	< 148	< 78	< 178	< 67	< 77	< 1494
	AVERAGE*	4428 ± 1014	-	-	-	-	-	-	-	-
SA-ESF-11A1	04/27/15	3665 ± 1137	< 65	< 82	< 173	< 65	< 146	< 80	< 75	< 1456
	04/27/15	4399 ± 1273	< 64	< 62	< 141	< 61	< 154	< 67	< 65	< 1787
	11/05/15	4414 ± 1076	< 93	< 86	< 161	< 70	< 167	< 92	< 92	< 1736
	AVERAGE*	4159 ± 856	-	-	-	-	-	-	-	-
SA-ESF-7E1	04/27/15	3549 ± 1187	< 70	< 75	< 160	< 81	< 137	< 62	< 75	< 1334
	04/27/15	3552 ± 733	< 44	< 43	< 98	< 41	< 101	< 44	< 56	< 858
	11/03/15	3549 ± 1200	< 74	< 80	< 164	< 85	< 117	< 75	< 72	< 1692
	11/05/15	4512 ± 1240	< 42	< 65	< 116	< 51	< 94	< 62	< 54	< 1228
	AVERAGE*	3791 ± 962	-	-	-	-	-	-	-	-

(C) CONTROL STATION

* THE AVERAGE AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES

TABLE C-17 CONCENTRATIONS OF GAMMA EMITTERS IN CRABS

Results in Units of pCi/kg (wet) ± 2 sigma

STATION ID	COLLECTION PERIOD	<————GAMMA EMITTERS————> K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Cs-134	Cs-137	Ra-226
SA-ECH-12C1 (C)	07/20/15	3015 ± 1155	< 85	< 88	< 226	< 99	< 165	< 86	< 90	< 1732
	09/02/15	3868 ± 953	< 66	< 66	< 152	< 66	< 107	< 70	< 67	< 1648
	AVERAGE*	3442 ± 1206	-	-	-	-	-	-	-	-
SA-ECH-11A1	07/20/15	3771 ± 891	< 45	< 60	< 120	< 48	< 108	< 60	< 56	< 1177
	09/02/15	3129 ± 1001	< 69	< 74	< 138	< 66	< 135	< 56	< 49	< 1503
	AVERAGE*	3450 ± 908	-	-	-	-	-	-	-	-

(C) CONTROL STATION

* THE AVERAGE AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES

TABLE C-18 CONCENTRATIONS OF GAMMA EMITTERS IN SEDIMENT, 2015

Results in Units of pCi/kg (dry) ± 2 Sigma

STATION ID	COLLECTION PERIOD	<——GAMMA EMITTERS——> Be-7	K-40	Cs-134	Cs-137	Ra-226	Th-232
SA-ESS-12C1 (C)	06/29/15	< 465	10070 ± 957	< 38	< 44	1385 ± 911	657 ± 143
	11/25/15	< 1001	16490 ± 2849	< 106	< 122	< 1953	882 ± 237
	AVERAGE*	-	13280 ± 9079	-	-	1385 ± 0	769 ± 318
SA-ESS-11A1	06/29/15	< 414	2545 ± 625	< 35	< 33	< 853	261 ± 110
	11/25/15	< 425	4215 ± 843	< 42	< 45	< 1170	196 ± 83
	AVERAGE*	-	3380 ± 2362	-	-	-	229 ± 91
SA-ESS-15A1	06/29/15	< 311	5060 ± 607	< 29	< 34	< 606	446 ± 88
	11/25/15	< 852	5682 ± 1548	< 105	< 103	< 2080	734 ± 245
	AVERAGE*	-	5371 ± 880	-	-	-	590 ± 407
SA-ESS-16A1	06/29/15	< 364	3920 ± 623	< 31	< 35	< 767	616 ± 104
	11/25/15	< 550	2998 ± 801	< 61	< 58	< 1047	516 ± 127
	AVERAGE*	-	3459 ± 1304	-	-	-	566 ± 141
SA-ESS-16F1	06/29/15	< 787	9942 ± 1371	< 74	< 83	< 1613	715 ± 170
	11/25/15	< 1493	16840 ± 3016	< 125	< 172	< 3737	920 ± 319
	AVERAGE*	-	13391 ± 9755	-	-	-	818 ± 290
SA-ESS-6S2	11/30/15	< 354	2896 ± 742	< 34	< 39	< 809	< 269
AVERAGE*	-	2896 ± 0		- -		-	-
SA-ESS-7E1	06/29/15	< 502	13530 ± 1116	< 51	< 49	1615 ± 868	763 ± 164
	11/25/15	< 703	13830 ± 1839	< 65	< 80	2649 ± 1635	822 ± 203
	AVERAGE*	-	13680 ± 424	-	-	2132 ± 1462	792 ± 83

(C) CONTROL STATION

* THE AVERAGE AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES

TABLE C-19 CONCENTRATIONS OF GAMMA EMITTERS IN OYSTERS

Results in Units of pCi/kg (wet) ± 2 sigma

STATION ID	COLLECTION PERIOD	<————GAMMA EMITTERS————> K-40	Mn-54	Co-58	Fe-59	Co-60	Zn-65	Cs-134	Cs-137
SA-EOY-7H1 (C)	06/22/15	2280 ± 957	< 79	< 69	< 184	< 66	< 135	< 72	< 72
	10/20/15	1510 ± 716	< 52	< 67	< 141	< 51	< 116	< 40	< 56
	AVERAGE*	1895 ± 1088	-	-	-	-	-	-	-
SA-EOY-7C1	06/22/15	< 293	< 55	< 61	< 120	< 48	< 107	< 47	< 51
	10/20/15	1130 ± 702	< 48	< 70	< 123	< 43	< 117	< 54	< 55
	AVERAGE*	1130 ± 702	-	-	-	-	-	-	-

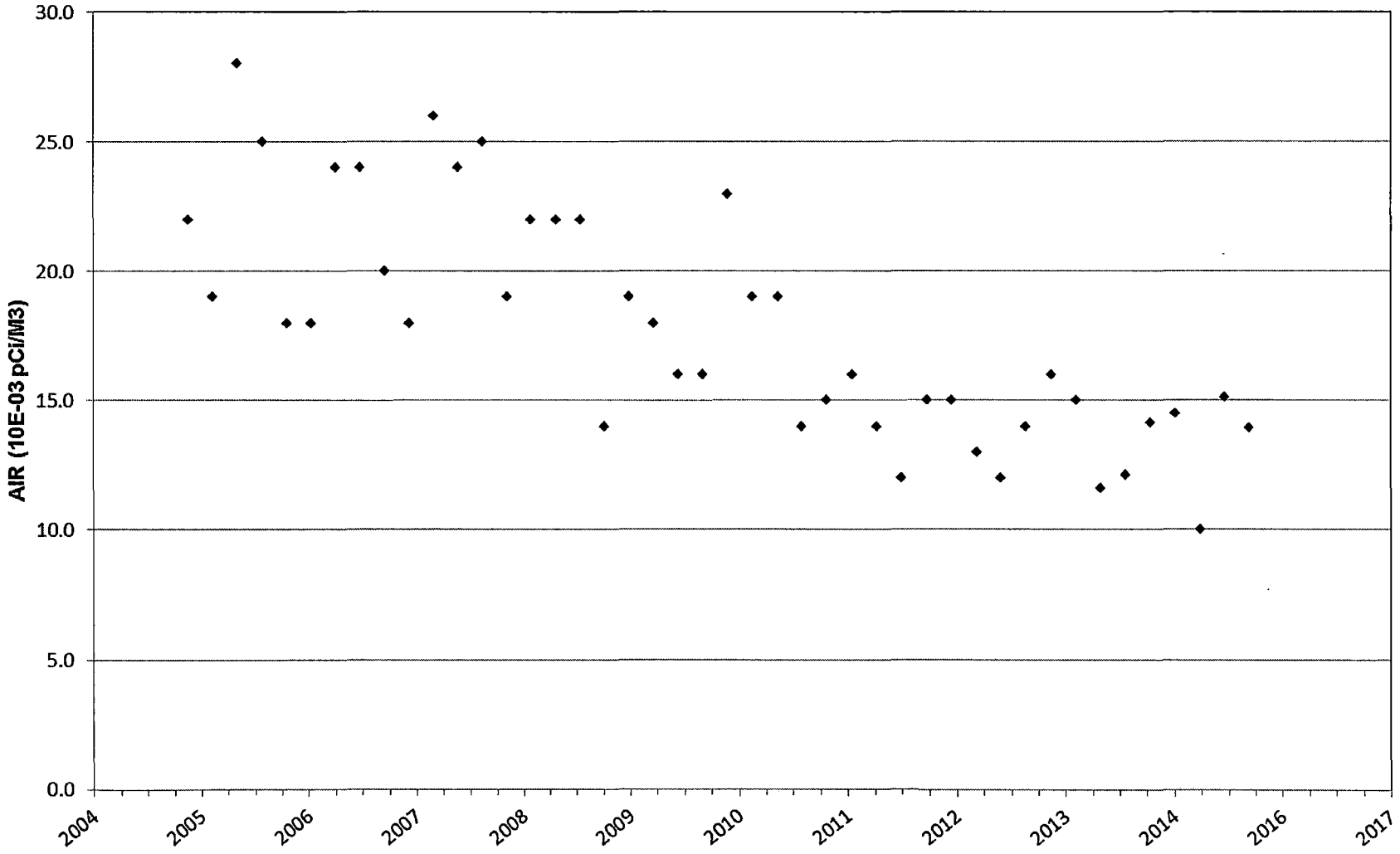
(C) CONTROL STATION

* THE AVERAGE AND 2 STANDARD DEVIATION VALUES ARE CALCULATED USING THE POSITIVE VALUES

TABLE C-20 Concentrations of Gamma Emitters in Duplicate Samples from GEL

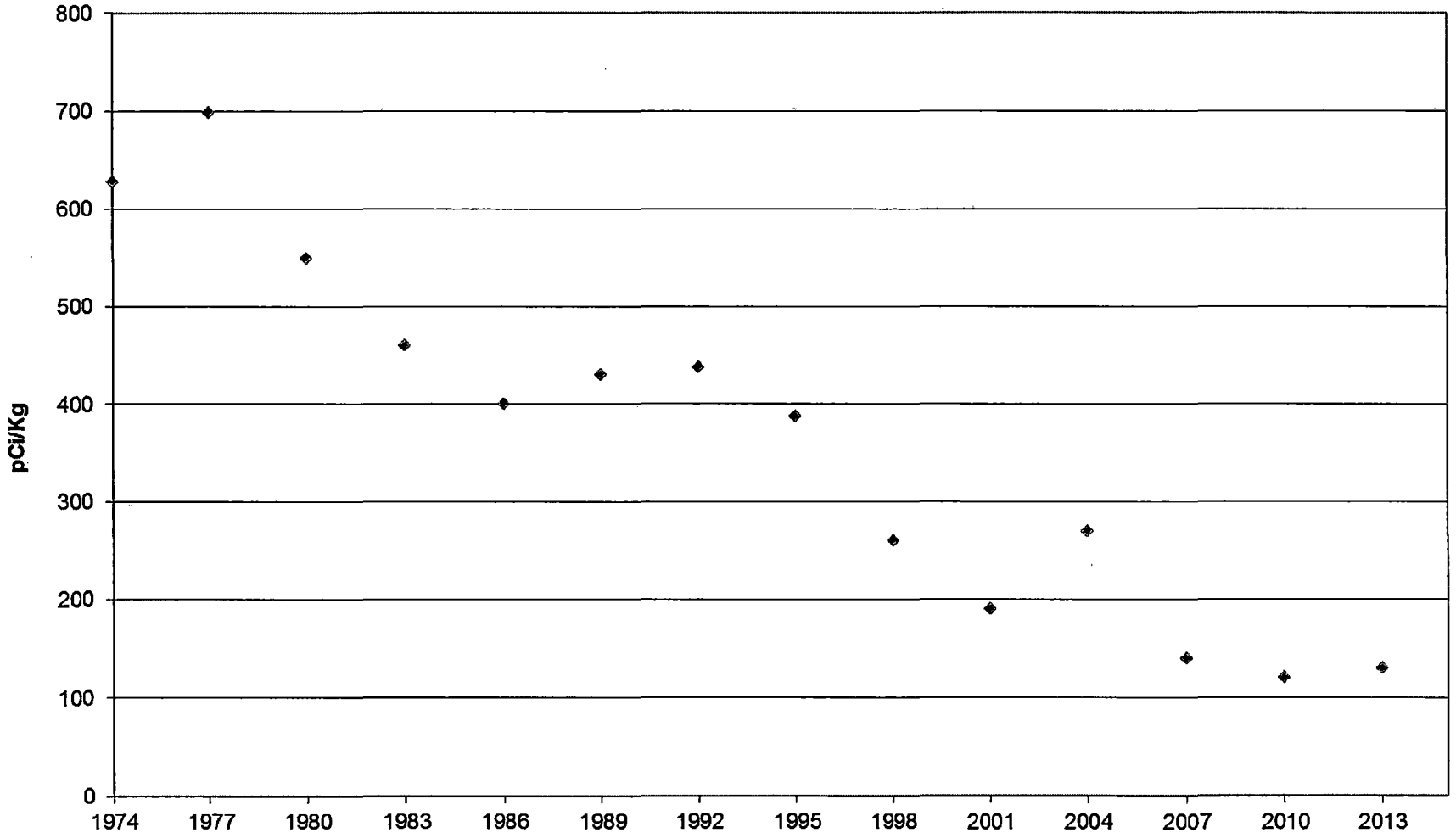
Sample Name	Date Collected	Nuclide	Result		2 Sigma	Units	Type
SA-APT-5S2	26-Mar-15	BE-7	1.03E-01	+/-	2.72E-02	pCi/m^3	Air Sample Composite
SA-APT-5S2	25-Jun-15	BE-7	6.71E-02	+/-	1.97E-02	pCi/m^3	Air Sample Composite
SA-APT-5S2	24-Sep-15	BE-7	1.05E-01	+/-	2.32E-02	pCi/m^3	Air Sample Composite
SA-APT-5S2	24-Dec-15	BE-7	8.61E-02	+/-	1.48E-02	pCi/m^3	Air Sample Composite
SA-MLK-14F4	5-Jan-15	K-40	1.40E+03	+/-	1.60E+02	pCi/L	Milk
SA-MLK-14F4	2-Feb-15	K-40	1.51E+03	+/-	9.01E+01	pCi/L	Milk
SA-MLK-14F4	2-Mar-15	K-40	1.45E+03	+/-	5.69E+01	pCi/L	Milk
SA-MLK-14F4	6-Apr-15	K-40	1.53E+03	+/-	6.40E+01	pCi/L	Milk
SA-MLK-14F4	11-May-15	K-40	1.45E+03	+/-	5.12E+01	pCi/L	Milk
SA-MLK-14F4	8-Jun-15	K-40	1.46E+03	+/-	5.92E+01	pCi/L	Milk
SA-MLK-14F4	6-Jul-15	K-40	1.47E+03	+/-	5.44E+01	pCi/L	Milk
SA-MLK-14F4	3-Aug-15	K-40	1.41E+03	+/-	5.23E+01	pCi/L	Milk
SA-MLK-14F4	8-Sep-15	K-40	1.46E+03	+/-	6.31E+01	pCi/L	Milk
SA-MLK-14F4	6-Oct-15	K-40	1.49E+03	+/-	6.82E+01	pCi/L	Milk
SA-MLK-14F4	2-Nov-15	K-40	1.39E+03	+/-	5.70E+01	pCi/L	Milk
SA-MLK-14F4	7-Dec-15	K-40	1.42E+03	+/-	5.14E+01	pCi/L	Milk
SA-SWA-11A1	4-Mar-15	K-40	1.51E+02	+/-	2.96E+01	pCi/L	Surface Water
SA-SWA-11A1	4-Jun-15	K-40	5.43E+01	+/-	2.64E+01	pCi/L	Surface Water
SA-SWA-11A1	23-Sep-15	K-40	1.25E+02	+/-	2.58E+01	pCi/L	Surface Water
SA-SWA-11A1	22-Dec-15	K-40	1.11E+02	+/-	2.52E+01	pCi/L	Surface Water
SA-FPL-10D1	30-Nov-15	BE-7	3.10E+02	+/-	1.30E+02	pCi/Kg	Cabbage
SA-FPL-10D1	30-Nov-15	K-40	2.37E+03	+/-	3.03E+02	pCi/Kg	Cabbage
SA-FPL-15S2	15-Jul-15	K-40	3.66E+03	+/-	4.10E+02	pCi/Kg	Kohlrabi
SA-FPL-16S1	15-Jul-15	K-40	3.78E+03	+/-	4.76E+02	pCi/Kg	Cabbage
SA-FPL-16S1	30-Sep-15	K-40	2.76E+03	+/-	1.90E+02	pCi/Kg	Cabbage
SA-FPL-16S1	30-Sep-15	K-40	3.06E+03	+/-	1.92E+02	pCi/Kg	Collards
SA-FPL-1G1	22-Jul-15	K-40	3.06E+03	+/-	4.63E+02	pCi/Kg	Cabbage
SA-FPL-3H5	22-Jul-15	K-40	1.76E+03	+/-	2.66E+02	pCi/Kg	Cabbage
SA-FPL-7S2	30-Sep-15	K-40	5.61E+03	+/-	2.81E+02	pCi/Kg	Collards
SA-FPV-2G2	10-May-15	K-40	1.76E+03	+/-	1.31E+02	pCi/Kg	Asparagus
SA-FPV-1G1	22-Jul-15	K-40	1.68E+03	+/-	1.79E+02	pCi/Kg	Tomatoes
SA-FPV-2F9	22-Jul-15	K-40	2.14E+03	+/-	2.00E+02	pCi/Kg	Tomatoes
SA-FPV-2F9	22-Jul-15	K-40	1.75E+03	+/-	1.60E+02	pCi/Kg	Peaches
SA-FPV-2F9	22-Jul-15	K-40	2.28E+03	+/-	2.20E+02	pCi/Kg	Corn
SA-FPV-3H5	22-Jul-15	K-40	2.37E+03	+/-	2.01E+02	pCi/Kg	Corn
SA-ESS-11A1	29-Jun-15	K-40	2.94E+03	+/-	3.91E+02	pCi/Kg	Sediment
SA-ESS-11A1	29-Jun-15	RA-226	2.30E+02	+/-	6.09E+01	pCi/Kg	Sediment
SA-ESS-11A1	25-Nov-15	K-40	3.97E+03	+/-	3.56E+02	pCi/Kg	Sediment
SA-ESS-11A1	25-Nov-15	RA-226	3.07E+02	+/-	4.84E+01	pCi/Kg	Sediment

FIGURE 1
GROSS BETA ACTIVITY IN AIR PARTICULATES - QUARTERLY AVERAGE FOR ALL LOCATIONS
2005 THROUGH 2015[1]



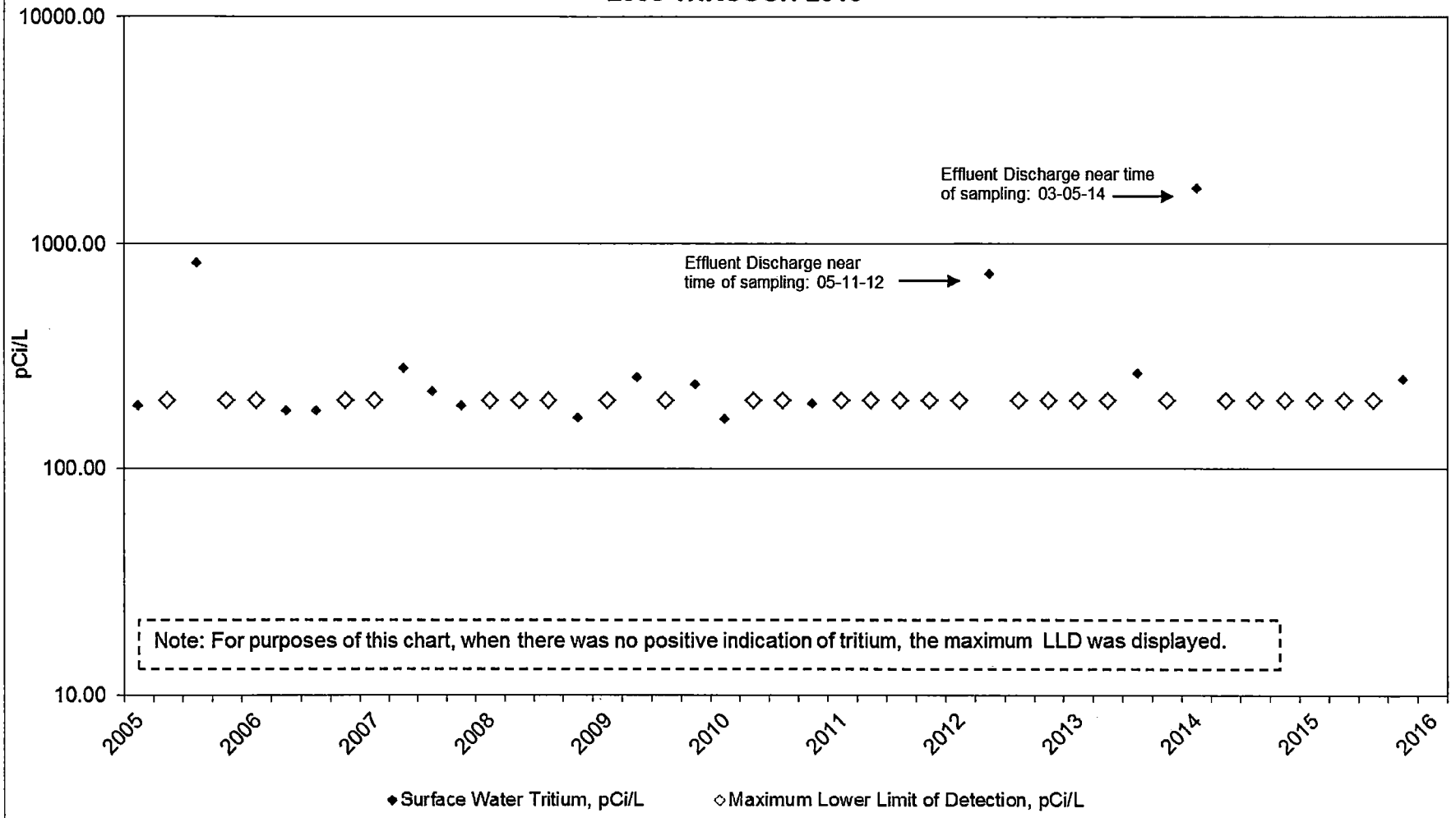
1- 2013 data includes temporary sampling locations

FIGURE 2
CESIUM-137 ACTIVITY IN SOIL 1974 THROUGH 2015
(TRIENNIAL)



Soil is sampled every three years. Last samples were taken in 2013. Annual values are an average of the results from the nine soil sample sites.

FIGURE 3
TRITIUM ACTIVITY IN SURFACE WATER - QUARTERLY AVERAGE
2005 THROUGH 2015



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APPENDIX D

SUMMARY OF INTER-LABORATORY COMPARISON PROGRAM

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TABLE D-1

ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM
TELEDYNE BROWN ENGINEERING ENVIRONMENTAL SERVICES

Month/Year	Identification Number	Matrix	Nuclide	Units	Reported Value (a)	Known Value (b)	Ratio (c) TBE/Analytics	Evaluation (d)
March 2015	E11181	Milk	Sr-89	pCi/L	88.9	97.2	0.91	A
			Sr-90	pCi/L	12.2	17.4	0.70	W
	E11182	Milk	I-131	pCi/L	61.3	65.1	0.94	A
			Ce-141	pCi/L	104	113	0.92	A
			Cr-51	pCi/L	265	276	0.96	A
			Cs-134	pCi/L	138	154	0.90	A
			Cs-137	pCi/L	205	207	0.99	A
			Co-58	pCi/L	178	183	0.97	A
			Mn-54	pCi/L	187	188	0.99	A
			Fe-59	pCi/L	182	177	1.03	A
			Zn-65	pCi/L	345	351	0.98	A
			Co-60	pCi/L	379	405	0.94	A
	E11184	AP	Ce-141	pCi	107	85.0	1.26	W
			Cr-51	pCi	261	224	1.17	A
			Cs-134	pCi	74.6	77.0	0.97	A
			Cs-137	pCi	99.6	102	0.98	A
			Co-58	pCi	99.8	110	0.91	A
			Mn-54	pCi	99.2	96.9	1.02	A
			Fe-59	pCi	109	119	0.92	A
			Zn-65	pCi	188	183	1.03	A
			Co-60	pCi	200	201	1.00	A
	E11183	Charcoal	I-131	pCi	82.9	85.4	0.97	A
	E11185	Water	Fe-55	pCi/L	1950	1900	1.03	A
June 2015	E11234	Milk	Sr-89	pCi/L	94.9	92.6	1.02	A
			Sr-90	pCi/L	14.3	12.7	1.13	A
	E11238	Milk	I-131	pCi/L	93.2	95.9	0.97	A
			Cr-51	pCi/L	349	276	1.26	W
			Cs-134	pCi/L	165	163	1.01	A
			Cs-137	pCi/L	143.0	125	1.14	A
			Co-58	pCi/L	82.0	68.4	1.20	A
			Mn-54	pCi/L	113	101	1.12	A
			Fe-59	pCi/L	184	151	1.22	W
			Zn-65	pCi/L	269	248	1.08	A
			Co-60	pCi/L	208	193	1.08	A
	E11237	AP	Cr-51		323	233	1.39	N (1)
			Cs-134		139	138	1.01	A
			Cs-137		111	106	1.05	A
			Co-58		54.0	57.8	0.93	A
			Mn-54		96.8	84.9	1.14	A
			Fe-59		162	128	1.27	W
			Zn-65		198	210	0.94	A
			Co-60		178	163	1.09	A
	E11236	Charcoal	I-131	pCi	93.9	80	1.17	A

TABLE D-1

ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM
TELEDYNE BROWN ENGINEERING ENVIRONMENTAL SERVICES

Month/Year	Identification Number	Matrix	Nuclide	Units	Reported Value (a)	Known Value (b)	Ratio (c) TBE/Analytics	Evaluation (d)
June 2015	E11238	Water	Fe-55	pCi/L	1890	1790	1.06	A
September 2015	E11289	Milk	Sr-89	pCi/L	95.7	99.1	0.97	A
			Sr-90	pCi/L	15.4	16.4	0.94	A
	E11290	Milk	I-131	pCi/L	94.9	99.9	0.95	A
			Ce-141	pCi/L	228	213	1.07	A
			Cr-51	pCi/L	499	538	0.93	A
			Cs-134	pCi/L	208	212	0.98	A
			Cs-137	pCi/L	270	255	1.06	A
			Co-58	pCi/L	275	263	1.05	A
			Mn-54	pCi/L	320	290	1.10	A
			Fe-59	pCi/L	255	226	1.13	A
			Zn-65	pCi/L	392	353	1.11	A
			Co-60	pCi/L	350	330	1.06	A
	E11292	AP	Ce-141	pCi	104	85.1	1.22	W
			Cr-51	pCi	262	215	1.22	W
			Cs-134	pCi	86.1	84.6	1.02	A
			Cs-137	pCi	93.0	102	0.91	A
			Co-58	pCi	106	105	1.01	A
			Mn-54	pCi	117	116	1.01	A
			Fe-59	pCi	94.8	90.2	1.05	A
			Zn-65	pCi	160	141	1.13	A
			Co-60	pCi	146	132	1.11	A
	E11291	Charcoal	I-131	pCi	85.9	81.7	1.05	A
	E11293	Water	Fe-55	pCi/L	2090	1800	1.16	A
	E11294	Soil	Ce-141	pCi/kg	209	222	0.94	A
			Cr-51	pCi/kg	463	560	0.83	A
			Cs-134	pCi/kg	231	221	1.05	A
			Cs-137	pCi/kg	311	344	0.90	A
			Co-58	pCi/kg	245	274	0.89	A
			Mn-54	pCi/kg	297	302	0.98	A
			Fe-59	pCi/kg	248	235	1.06	A
			Zn-65	pCi/kg	347	368	0.94	A
			Co-60	pCi/kg	328	344	0.95	A
December 2015	E11354	Milk	Sr-89	pCi/L	96.2	86.8	1.11	A
			Sr-90	pCi/L	14.8	12.5	1.18	A
	E11355	Milk	I-131	pCi/L	95.1	91.2	1.04	A
			Ce-141	pCi/L	117	129	0.91	A
			Cr-51	pCi/L	265	281	0.94	A
			Cs-134	pCi/L	153	160	0.96	A
			Cs-137	pCi/L	119	115	1.03	A
			Co-58	pCi/L	107	110	0.97	A
			Mn-54	pCi/L	153	145	1.06	A
			Fe-59	pCi/L	117	108	1.08	A
			Zn-65	pCi/L	261	248	1.05	A
			Co-60	pCi/L	212	213	1.00	A

TABLE D-1

ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM
TELEDYNE BROWN ENGINEERING ENVIRONMENTAL SERVICES

Month/Year	Identification Number	Matrix	Nuclide	Units	Reported Value (a)	Known Value (b)	Ratio (c) TBE/Analytics	Evaluation (d)
December 2015	E11357	AP	Ce-141	pCi	89.9	84.0	1.07	A
			Cr-51	pCi	215	184	1.17	A
			Cs-134	pCi	103	105	0.98	A
			Cs-137	pCi	76.6	74.8	1.02	A
			Co-58	pCi	76.2	71.9	1.06	A
			Mn-54	pCi	91.4	94.4	0.97	A
			Fe-59	pCi	78.6	70.3	1.12	A
			Zn-65	pCi	173	162	1.07	A
			Co-60	pCi	138	139	0.99	A
	E11422	AP	Sr-89	pCi	98.0	96.9	1.01	A
			Sr-90	pCi	10.0	14.0	0.71	W
	E11356	Charcoal	I-131	pCi	74.9	75.2	1.00	A
	E11358	Water	Fe-55	pCi/L	2160	1710	1.26	W
	E11353	Soil	Ce-141	pCi/kg	252	222	1.14	A
			Cr-51	pCi/kg	485	485	1.00	A
			Cs-134	pCi/kg	319	277	1.15	A
			Cs-137	pCi/kg	292	276	1.06	A
			Co-58	pCi/kg	193	190	1.02	A
			Mn-54	pCi/kg	258	250	1.03	A
			Fe-59	pCi/kg	218	186	1.17	A
			Zn-65	pCi/kg	457	429	1.07	A
			Co-60	pCi/kg	381	368	1.04	A

(1) AP Cr-51 - Cr-51 has the shortest half-life and the weakest gamma energy of the mixed nuclide sample, which produces a large error. Taking into account the error, the lowest value would be 119% of the reference value, which would be considered acceptable. NCR 15-18

(a) Teledyne Brown Engineering reported result.

(b) The Analytics known value is equal to 100% of the parameter present in the standard as determined by gravimetric and/or volumetric measurements made during standard preparation.

(c) Ratio of Teledyne Brown Engineering to Analytics results.

(d) Analytics evaluation based on TBE internal QC limits: A= Acceptable, reported result falls within ratio limits of 0.80-1.20. W-Acceptable with warning, reported result falls within 0.70-0.80 or 1.20-1.30. N = Not Acceptable, reported result falls outside the ratio limits of < 0.70 and > 1.30.

TABLE D-2

DOE's MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP)
TELEDYNE BROWN ENGINEERING ENVIRONMENTAL SERVICES

Month/Year	Identification Number	Media	Nuclide*	Units	Reported Value (a)	Known Value (b)	Acceptance Range	Evaluation (c)
March 2015	15-MaW32	Water	Am-241	Bq/L	0.632	0.654	0.458 - 0.850	A
			Ni-63	Bq/L	2.5		(1)	A
			Pu-238	Bq/L	0.0204	0.0089	(2)	A
			Pu-239/240	Bq/L	0.9	0.8	0.582 - 1.082	A
	15-MaS32	Soil	Ni-63	Bq/kg	392	448.0	314 - 582	A
			Sr-90	Bq/kg	286	653	487 - 849	N (3)
	15-RdF32	AP	Sr-90	Bq/sample	-0.0991		(1)	A
			U-234/233	Bq/sample	0.0211	0.0155	0.0109 - 0.0202	N (3)
			U-238	Bq/sample	0.095	0.099	0.069 - 0.129	A
	15-GrF32	AP	Gr-A	Bq/sample	0.448	1.77	0.53 - 3.01	N (3)
			Gr-B	Bq/sample	0.7580	0.75	0.38 - 1.13	A
	15-RdV32	Vegetation	Cs-134	Bq/sample	8.08	7.32	5.12 - 9.52	A
			Cs-137	Bq/sample	11.6	9.18	6.43 - 11.93	W
			Co-57	Bq/sample	-0.0096		(1)	A
			Co-60	Bq/sample	6.53	5.55	3.89 - 7.22	A
			Mn-54	Bq/sample	0.0058		(1)	A
			Sr-90	Bq/sample	0.999	1.08	0.76 - 1.40	A
			Zn-65	Bq/sample	-0.108		(1)	A
September 2015	15-MaW33	Water	Am-241	Bq/L	1.012	1.055	0.739 - 1.372	A
			Ni-63	Bq/L	11.8	8.55	5.99 - 11.12	N (4)
			Pu-238	Bq/L	0.727	0.681	0.477 - 0.885	A
			Pu-239/240	Bq/L	0.830	0.900	0.630 - 1.170	A
	15-MaS33	Soil	Ni-63	Bq/kg	635	682	477 - 887	A
			Sr-90	Bq/kg	429	425	298 - 553	A
	15-RdF33	AP	Sr-90	Bq/sample	1.48	2.18	1.53 - 2.83	N (4)
			U-234/233	Bq/sample	0.143	0.143	0.100 - 0.186	A
			U-238	Bq/sample	0.149	0.148	0.104 - 0.192	A
	15-GrF33	AP	Gr-A	Bq/sample	0.497	0.90	0.27 - 1.53	A
			Gr-B	Bq/sample	1.34	1.56	0.78 - 2.34	A
	15-RdV33	Vegetation	Cs-134	Bq/sample	6.10	5.80	4.06 - 7.54	A
			Cs-137	Bq/sample	0.0002		(1)	A
			Co-57	Bq/sample	8.01	6.62	4.63 - 8.61	W
			Co-60	Bq/sample	4.97	4.56	3.19 - 5.93	A
			Mn-54	Bq/sample	8.33	7.68	5.38 - 9.98	A
			Sr-90	Bq/sample	0.386	1.30	0.91 - 1.69	N (4)
			Zn-65	Bq/sample	6.07	5.46	3.82 - 7.10	A

(1) False positive test.

(2) Sensitivity evaluation.

(3) Water Ni-63 extremely low activity was difficult to quantify; AP & Vegetation Sr-90 was lost during separation, possible from substance added by MAPEP NCR 15-21.

(a) Teledyne Brown Engineering reported result.

(b) The MAPEP known value is equal to 100% of the parameter present in the standard as determined by gravimetric and/or volumetric measurements made during standard preparation.

(c) DOE/MAPEP evaluation: A=acceptable, W=acceptable with warning, N=not acceptable.

TABLE D-3

ERA ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM
TELEDYNE BROWN ENGINEERING ENVIRONMENTAL SERVICES

Month/Year	Identification Number	Media	Nuclide	Units	Reported Value (a)	Known Value (b)	Acceptance Limits	Evaluation (c)
Mav 2015	RAD-101	Water	Sr-89	pCi/L	45.2	63.2	51.1 - 71.2	N (1)
			Sr-90	pCi/L	28.0	41.9	30.8 - 48.1	N (1)
			Ba-133	pCi/L	80.6	82.5	63.9 - 90.8	A
			Cs-134	pCi/L	71.7	75.7	61.8 - 83.3	A
			Cs-137	pCi/L	187	189	170 - 210	A
			Co-60	pCi/L	85.7	84.5	76.0 - 95.3	A
			Zn-65	pCi/L	197	203	183 - 238	A
			Gr-A	pCi/L	26.1	42.6	22.1 - 54.0	A
			Gr-B	pCi/L	28.8	32.9	21.3 - 40.6	A
			I-131	pCi/L	23.5	23.8	19.7 - 28.3	A
			U-Nat	pCi/L	6.19	6.59	4.99 - 7.83	A
			H-3	pCi/L	3145	3280	2770 - 3620	A
November 2015	RAD-103	Water	Sr-89	pCi/L	40.9	35.7	26.7 - 42.5	A
			Sr-90	pCi/L	29.3	31.1	22.7 - 36.1	A
			Ba-133	pCi/L	31.5	32.5	25.9 - 36.7	A
			Cs-134	pCi/L	59.65	62.3	50.6 - 68.5	A
			Cs-137	pCi/L	156	157	141 - 175	A
			Co-60	pCi/L	70.6	71.1	64.0 - 80.7	A
			Zn-65	pCi/L	145	126	113 - 149	A
			Gr-A	pCi/L	38.2	51.6	26.9 - 64.7	A
			Gr-B	pCi/L	42.0	36.6	24.1 - 44.2	A
			I-131	pCi/L	24.8	26.3	21.9 - 31.0	A
			U-Nat	pCi/L	146.90	56.2	45.7 - 62.4	N (2)
			H-3	pCi/L	21100	21300	18700 - 23400	A

(1) Yield on the high side of acceptance range indicates possibility of calcium interference. NCR 15-09

(2) Technician failed to dilute original sample. If dilulted, the result would have been 57.1, which fell within the acceptance limits. NCR 15-19

(a) Teledyne Brown Engineering reported result.

(b) The ERA known value is equal to 100% of the parameter present in the standard as determined by gravimetric and/or volumetric measurements made during standard preparation.

(c) ERA evaluation: A=acceptable. Reported result falls within the Warning Limits. NA=not acceptable. Reported result falls outside of the Control Limits. CE=check for Error. Reported result falls within the Control Limits and outside of the Warning Limit

Table D-4

GEL 2015 ECKERT & ZIEGLER ANALYTICS PERFORMANCE EVALUATION RESULTS

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
EZA	1st/2015	5/21/2015	E11174	Cartridge	pCi	Iodine-131	8.01E+01	7.74E+01	1.03	Acceptable
EZA	1st/2015	5/21/2015	E11175	Milk	pCi/L	Strontium-89	9.75E+01	1.05E+02	0.93	Acceptable
EZA	1st/2015	5/21/2015	E11175	Milk	pCi/L	Strontium-90	1.10E+01	1.44E+01	0.77	Acceptable
EZA	1st/2015	5/21/2015	E11176	Milk	pCi/L	Iodine-131	9.60E+01	9.75E+01	0.98	Acceptable
EZA	1st/2015	5/21/2015	E11176	Milk	pCi/L	Cerium-141	2.13E+02	2.11E+02	1.01	Acceptable
EZA	1st/2015	5/21/2015	E11176	Milk	pCi/L	Chromium-51	5.88E+02	5.55E+02	1.06	Acceptable
EZA	1st/2015	5/21/2015	E11176	Milk	pCi/L	Cesium-134	1.71E+02	1.91E+02	0.90	Acceptable
EZA	1st/2015	5/21/2015	E11176	Milk	pCi/L	Cesium-137	2.59E+02	2.53E+02	1.02	Acceptable
EZA	1st/2015	5/21/2015	E11176	Milk	pCi/L	Cobalt-58	2.64E+02	2.72E+02	0.97	Acceptable
EZA	1st/2015	5/21/2015	E11176	Milk	pCi/L	Manganese-54	2.43E+02	2.40E+02	1.01	Acceptable
EZA	1st/2015	5/21/2015	E11176	Milk	pCi/L	Iron-59	3.14E+02	2.95E+02	1.06	Acceptable
EZA	1st/2015	5/21/2015	E11176	Milk	pCi/L	Zinc-65	4.67E+02	4.53E+02	1.03	Acceptable
EZA	1st/2015	5/21/2015	E11176	Milk	pCi/L	Cobalt-60	4.81E+02	4.98E+02	0.97	Acceptable
EZA	1st/2015	5/21/2015	E11177	Water	pCi/L	Iodine-131	9.92E+01	9.67E+01	1.03	Acceptable
EZA	1st/2015	5/21/2015	E11177	Water	pCi/L	Cerium-141	1.40E+02	1.39E+02	1.01	Acceptable
EZA	1st/2015	5/21/2015	E11177	Water	pCi/L	Chromium-51	3.95E+02	3.66E+02	1.08	Acceptable
EZA	1st/2015	5/21/2015	E11177	Water	pCi/L	Cesium-134	1.12E+02	1.26E+02	0.89	Acceptable
EZA	1st/2015	5/21/2015	E11177	Water	pCi/L	Cesium-137	1.69E+02	1.67E+02	1.01	Acceptable
EZA	1st/2015	5/21/2015	E11177	Water	pCi/L	Cobalt-58	1.78E+02	1.80E+02	0.99	Acceptable
EZA	1st/2015	5/21/2015	E11177	Water	pCi/L	Manganese-54	1.66E+02	1.59E+02	1.05	Acceptable
EZA	1st/2015	5/21/2015	E11177	Water	pCi/L	Iron-59	2.14E+02	1.95E+02	1.10	Acceptable
EZA	1st/2015	5/21/2015	E11177	Water	pCi/L	Zinc-65	3.25E+02	2.99E+02	1.09	Acceptable
EZA	1st/2015	5/21/2015	E11177	Water	pCi/L	Cobalt-60	3.23E+02	3.28E+02	0.98	Acceptable
EZA	2nd/2015	8/6/2015	E11216	Cartridge	pCi	Iodine-131	8.92E+01	8.01E+01	1.11	Acceptable
EZA	2nd/2015	8/6/2015	E11217	Milk	pCi/L	Strontium-89	9.13E+01	8.26E+01	1.11	Acceptable
EZA	2nd/2015	8/6/2015	E11217	Milk	pCi/L	Strontium-90	1.16E+01	1.27E+01	0.91	Acceptable
EZA	2nd/2015	8/6/2015	E11218	Milk	pCi/L	Iodine-131	1.05E+02	9.59E+01	1.10	Acceptable
EZA	2nd/2015	8/6/2015	E11218	Milk	pCi/L	Cerium-141	2.70E+00	Not Pres.	-	Acceptable
EZA	2nd/2015	8/6/2015	E11218	Milk	pCi/L	Chromium-51	2.70E+02	2.76E+02	0.98	Acceptable
EZA	2nd/2015	8/6/2015	E11218	Milk	pCi/L	Cesium-134	1.46E+02	1.63E+02	0.9	Acceptable
EZA	2nd/2015	8/6/2015	E11218	Milk	pCi/L	Cesium-137	1.31E+02	1.25E+02	1.05	Acceptable
EZA	2nd/2015	8/6/2015	E11218	Milk	pCi/L	Cobalt-58	7.18E+01	6.84E+01	1.05	Acceptable
EZA	2nd/2015	8/6/2015	E11218	Milk	pCi/L	Manganese-54	1.02E+02	1.01E+02	1.01	Acceptable
EZA	2nd/2015	8/6/2015	E11218	Milk	pCi/L	Iron-59	1.51E+02	1.51E+02	1.00	Acceptable

Table D-4 (cont'd)

GEL 2015 ECKERT & ZIEGLER ANALYTICS PERFORMANCE EVALUATION RESULTS

PT Provider	Quarter/ Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL	Known value	Acceptance Range/ Ratio	Evaluation
EZA	2nd/2015	8/6/2015	E11218	Milk	pCi/L	Zinc-65	2.63E+02	2.48E+02	1.06	Acceptable
EZA	2nd/2015	8/6/2015	E11218	Milk	pCi/L	Cobalt-60	1.96E+02	1.93E+02	1.02	Acceptable
EZA	2nd/2015	8/6/2015	E11219	Water	pCi/L	Iodine-131	9.53E+01	9.34E+01	1.02	Acceptable
EZA	2nd/2015	8/6/2015	E11219	Water	pCi/L	Chromium-51	3.47E+02	2.93E+02	1.18	Acceptable
EZA	2nd/2015	8/6/2015	E11219	Water	pCi/L	Cesium-134	1.63E+02	1.73E+02	0.94	Acceptable
EZA	2nd/2015	8/6/2015	E11219	Water	pCi/L	Cesium-137	1.34E+02	1.33E+02	1.01	Acceptable
EZA	2nd/2015	8/6/2015	E11219	Water	pCi/L	Cobalt-58	7.21E+01	7.26E+01	0.99	Acceptable
EZA	2nd/2015	8/6/2015	E11219	Water	pCi/L	Manganese-54	1.17E+02	1.07E+02	1.1	Acceptable
EZA	2nd/2015	8/6/2015	E11219	Water	pCi/L	Iron-59	1.76E+02	1.61E+02	1.09	Acceptable
EZA	2nd/2015	8/6/2015	E11219	Water	pCi/L	Zinc-65	2.85E+02	2.64E+02	1.08	Acceptable
EZA	2nd/2015	8/6/2015	E11219	Water	pCi/L	Cobalt-60	2.10E+02	2.05E+02	1.03	Acceptable
EZA	3rd/2015	11/15/2015	E11310	Cartridge	pCi	Iodine-131	8.21E+01	8.15E+01	1.01	Acceptable
EZA	3rd/2015	11/15/2015	E11311	Milk	pCi/L	Strontium-89	8.79E+01	9.91E+01	0.89	Acceptable
EZA	3rd/2015	11/15/2015	E11311	Milk	pCi/L	Strontium-90	1.07E+01	1.64E+01	0.65	Acceptable
EZA	3rd/2015	11/15/2015	E11312	Milk	pCi/L	Iodine-131	9.61E+01	9.99E+01	0.96	Acceptable
EZA	3rd/2015	11/15/2015	E11312	Milk	pCi/L	Cerium-141	2.15E+02	2.13E+02	1.01	Acceptable
EZA	3rd/2015	11/15/2015	E11312	Milk	pCi/L	Chromium-51	5.82E+02	5.38E+02	1.08	Acceptable
EZA	3rd/2015	11/15/2015	E11312	Milk	pCi/L	Cesium-134	1.89E+02	2.12E+02	0.89	Acceptable
EZA	3rd/2015	11/15/2015	E11312	Milk	pCi/L	Cesium-137	2.43E+02	2.55E+02	0.95	Acceptable
EZA	3rd/2015	11/15/2015	E11312	Milk	pCi/L	Cobalt-58	2.50E+02	2.63E+02	0.95	Acceptable
EZA	3rd/2015	11/15/2015	E11312	Milk	pCi/L	Manganese-54	3.02E+02	2.90E+02	1.04	Acceptable
EZA	3rd/2015	11/15/2015	E11312	Milk	pCi/L	Iron-59	2.30E+02	2.26E+02	1.02	Acceptable
EZA	3rd/2015	11/15/2015	E11312	Milk	pCi/L	Zinc-65	3.62E+02	3.53E+02	1.02	Acceptable
EZA	3rd/2015	11/15/2015	E11312	Milk	pCi/L	Cobalt-60	3.42E+02	3.30E+02	1.04	Acceptable
EZA	3rd/2015	11/15/2015	E11313	Water	pCi/L	Iodine-131	1.00E+02	9.67E+01	1.03	Acceptable
EZA	3rd/2015	11/15/2015	E11313	Water	pCi/L	Cerium-141	2.05E+02	1.99E+02	1.03	Acceptable
EZA	3rd/2015	11/15/2015	E11313	Water	pCi/L	Chromium-51	5.42E+02	5.02E+02	1.08	Acceptable
EZA	3rd/2015	11/15/2015	E11313	Water	pCi/L	Cesium-134	1.75E+02	1.98E+02	0.89	Acceptable
EZA	3rd/2015	11/15/2015	E11313	Water	pCi/L	Cesium-137	2.40E+02	2.38E+02	1.01	Acceptable
EZA	3rd/2015	11/15/2015	E11313	Water	pCi/L	Cobalt-58	2.45E+02	2.46E+02	1.00	Acceptable
EZA	3rd/2015	11/15/2015	E11313	Water	pCi/L	Manganese-54	2.88E+02	2.71E+02	1.06	Acceptable
EZA	3rd/2015	11/15/2015	E11313	Water	pCi/L	Iron-59	2.31E+02	2.11E+02	1.10	Acceptable
EZA	3rd/2015	11/15/2015	E11313	Water	pCi/L	Zinc-65	3.75E+02	3.30E+02	1.14	Acceptable

Table D-4 (cont'd)

GEL 2015 ECKERT & ZIEGLER ANALYTICS PERFORMANCE EVALUATION RESULTS

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
EZA	3rd/2015	11/15/2015	E11313	Water	pCi/L	Cobalt-60	3.11E+02	3.08E+02	1.01	Acceptable
EZA	4th/2015	2/18/2016	E11412	Cartridge	pCi	Iodine-131	7.73E+01	7.98E+01	0.97	Acceptable
EZA	4th/2015	2/18/2016	E11413	Milk	pCi/L	Strontium-89	9.41E+01	8.61E+01	1.08	Acceptable
EZA	4th/2015	2/18/2016	E11413	Milk	pCi/L	Strontium-90	9.74E+00	1.25E+01	0.78	Acceptable
EZA	4th/2015	2/18/2016	E11414	Milk	pCi/L	Iodine-131	1.01E+02	9.12E+01	1.11	Acceptable
EZA	4th/2015	2/18/2016	E11414	Milk	pCi/L	Cerium-141	1.36E+02	1.29E+02	1.06	Acceptable
EZA	4th/2015	2/18/2016	E11414	Milk	pCi/L	Chromium-51	2.79E+02	2.81E+02	0.99	Acceptable
EZA	4th/2015	2/18/2016	E11414	Milk	pCi/L	Cesium-134	1.45E+02	1.60E+02	0.91	Acceptable
EZA	4th/2015	2/18/2016	E11414	Milk	pCi/L	Cesium-137	1.15E+02	1.15E+02	1.00	Acceptable
EZA	4th/2015	2/18/2016	E11414	Milk	pCi/L	Manganese-54	1.53E+02	1.45E+02	1.06	Acceptable
EZA	4th/2015	2/18/2016	E11414	Milk	pCi/L	Iron-59	1.19E+02	1.08E+02	1.10	Acceptable
EZA	4th/2015	2/18/2016	E11414	Milk	pCi/L	Zinc-65	2.69E+02	2.48E+02	1.08	Acceptable
EZA	4th/2015	2/18/2016	E11414	Milk	pCi/L	Cobalt-60	2.12E+02	2.13E+02	0.99	Acceptable
EZA	4th/2015	2/18/2016	E11415	Water	pCi/L	Iodine-131	1.05E+02	9.26E+01	1.13	Acceptable
EZA	4th/2015	2/18/2016	E11415	Water	pCi/L	Cerium-141	1.27E+02	1.12E+02	1.14	Acceptable
EZA	4th/2015	2/18/2016	E11415	Water	pCi/L	Chromium-51	2.60E+02	2.44E+02	1.07	Acceptable
EZA	4th/2015	2/18/2016	E11415	Water	pCi/L	Cesium-134	1.25E+02	1.39E+02	0.90	Acceptable
EZA	4th/2015	2/18/2016	E11415	Water	pCi/L	Cesium-137	1.12E+02	9.95E+01	1.13	Acceptable
EZA	4th/2015	2/18/2016	E11415	Water	pCi/L	Cobalt-58	9.73E+01	9.56E+01	1.02	Acceptable
EZA	4th/2015	2/18/2016	E11415	Water	pCi/L	Manganese-54	1.41E+02	1.26E+02	1.12	Acceptable
EZA	4th/2015	2/18/2016	E11415	Water	pCi/L	Iron-59	1.11E+02	9.34E+01	1.19	Acceptable
EZA	4th/2015	2/18/2016	E11415	Water	pCi/L	Zinc-65	2.43E+02	2.15E+02	1.13	Acceptable
EZA	4th/2015	2/18/2016	E11415	Water	pCi/L	Cobalt-60	1.92E+02	1.85E+02	1.04	Acceptable

Table D-5

GEL 2015 DEPARTMENT OF ENERGY MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP) RESULTS

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MAPEP	2nd/2015	6/16/2015	MAPEP-15- GrF32	Filter	Bq/sample	Gross Alpha	1.52	1.77	0.53-3.01	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15- GrF32	Filter	Bq/sample	Gross Beta	0.844	0.75	0.38-1.13	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-MaS32	Soil	Bq/Kg	Americium-241	114	97	68-126	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-MaS32	Soil	Bq/Kg	Cesium-134	639	678	475-881	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-MaS32	Soil	Bq/Kg	Cesium-137	-0.279	-	False Pos Test	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-MaS32	Soil	Bq/Kg	Cobalt-57	0.369	-	False Pos Test	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-MaS32	Soil	Bq/Kg	Cobalt-60	852	817	572-1062	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-MaS32	Soil	Bq/Kg	Iron-55	330	205	Sens. Eval.	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-MaS32	Soil	Bq/Kg	Manganese-54	1280	1198	839-1557	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-MaS32	Soil	Bq/Kg	Nickel-63	481	448	314-582	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-MaS32	Soil	Bq/Kg	Plutonium-238	80.3	83.9	58.7-109.1	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-MaS32	Soil	Bq/Kg	Plutonium-239/240	69.1	70.8	49.6-92.0	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-MaS32	Soil	Bq/Kg	Potassium-40	684	622	435-809	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-MaS32	Soil	Bq/Kg	Strontium-90	601	653	457-849	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-MaS32	Soil	Bq/Kg	Technetium-99	694	867	607-1127	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-MaS32	Soil	Bq/Kg	U-234/233	58	53	36.8-68.3	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-MaS32	Soil	Bq/Kg	Uranium-238	204	201	141-261	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-MaS32	Soil	Bq/Kg	Zinc-65	1190	1064	745-1383	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-GrW32	Water	Bq/L	Americium-241	0.657	0.654	0.458-0.850	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-GrW32	Water	Bq/L	Cesium-134	20.8	23.5	16.5-30.6	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-GrW32	Water	Bq/L	Cesium-137	19.7	19.1	13.4-24.8	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-GrW32	Water	Bq/L	Cobalt-57	30	29.9	20.9-38.9	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-GrW32	Water	Bq/L	Cobalt-60	0		False Pos Test	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-GrW32	Water	Bq/L	Hydrogen-3	633	563	394-732	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-GrW32	Water	Bq/L	Iron-55	8.81	6.88	4.82-8.94	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-GrW32	Water	Bq/L	Manganese-54	0.314		False Pos Test	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-GrW32	Water	Bq/L	Nickel-63	0.35		False Pos Test	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-GrW32	Water	Bq/L	Plutonium-238	0.0103	0.0089	Sens. Eval.	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-GrW32	Water	Bq/L	Plutonium-239/240	0.77	0.832	0.582-1.082	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-GrW32	Water	Bq/L	Potassium-40	0.159		False Pos Test	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-GrW32	Water	Bq/L	Strontium-90	8.49	9.48	6.64-12.32	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-GrW32	Water	Bq/L	Technetium-99	2.9	3.18	2.23-4.13	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-GrW32	Water	Bq/L	Uranium-234/233	0.146	0.148	0.104-0.192	Acceptable

Table D-5 (cont'd)

GEL 2015 DEPARTMENT OF ENERGY MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP) RESULTS

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MAPEP	2nd/2015	6/16/2015	MAPEP-15-GrW32	Water	Bq/L	Uranium-238	0.918	0.97	0.68-1.26	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-GrW32	Water	Bq/L	Zinc-65	19.6	18.3	12.8-23.8	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-GrW32	Water	Bq/L	Gross Alpha	1.05	1.066	0.320-1.812	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-GrW32	Water	Bq/L	Gross Beta	3.22	2.79	1.40-4.19	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-RdF32	Filter	ug/sample	Uranium-235	0.014	0.015	0.0103-0.0191	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-RdF32	Filter	ug/sample	Uranium-238	7.65	7.96	5.57-10.35	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-RdF32	Filter	ug/sample	Uranium-Total	7.96	8	5.58-10.36	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-RdF32	Filter	ug/sample	Americium-241	0.0657	0.068	0.0477-0.0885	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-RdF32	Filter	Bq/sample	Cesium-134	1.06	1.15	0.81-1.50	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-RdF32	Filter	Bq/sample	Cesium-137	0.0166	-	False Pos Test	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-RdF32	Filter	Bq/sample	Cobalt-57	1.59	1.51	1.06-1.96	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-RdF32	Filter	Bq/sample	Cobalt-60	0.016	-	False Pos Test	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-RdF32	Filter	Bq/sample	Manganese-54	0.998	1.02	0.71-1.33	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-RdF32	Filter	Bq/sample	Plutonium-238	0.00005	-	False Pos Test	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-RdF32	Filter	Bq/sample	Plutonium-239/240	0.0788	0.0847	0.0593-0.1101	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-RdF32	Filter	Bq/sample	Strontium-90	-0.025	-	False Pos Test	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-RdF32	Filter	Bq/sample	Uranium-234/233	0.017	0.0155	0.0109-0.0202	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-RdF32	Filter	Bq/sample	Uranium-238	0.0958	0.099	0.069-0.129	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-RdF32	Filter	Bq/sample	Zinc-65	0.867	0.83	0.58-1.08	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-RdV32	Vegetation	Bq/sample	Americium-241	0.116	0.11	0.076-0.140	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-RdV32	Vegetation	Bq/sample	Cesium-134	6.44	7.32	5.12-9.52	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-RdV32	Vegetation	Bq/sample	Cesium-137	9.3	9.18	6.43-11.93	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-RdV32	Vegetation	Bq/sample	Cobalt-57	0.037	-	False Pos Test	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-RdV32	Vegetation	Bq/sample	Cobalt-60	5.68	5.55	3.89-7.22	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-RdV32	Vegetation	Bq/sample	Manganese-54	0.009	-	False Pos Test	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-RdV32	Vegetation	Bq/sample	Plutonium-238	0.084	0.085	0.060-0.111	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-RdV32	Vegetation	Bq/sample	Plutonium-239/240	0.0898	0.094	0.066-0.122	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-RdV32	Vegetation	Bq/sample	Strontium-90	0.852	1.08	0.76-1.40	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-RdV32	Vegetation	Bq/sample	Uranium-234/233	0.023	0.022	0.0153-0.0283	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-RdV32	Vegetation	Bq/sample	Uranium-238	0.129	0.128	0.090-0.166	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-RdV32	Vegetation	Bq/sample	Zinc-65	0.0058	-	False Pos Test	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-SrF-32	Filter	Bq/sample	Strontium-89	41.7	47.5	33.3-61.8	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-SrF-32	Filter	Bq/sample	Strontium-90	0.749	1.06	0.74-1.38	Acceptable
MAPEP	2nd/2015	6/16/2015	MAPEP-15-XaW-32	Water	Bq/L	Iodine-129	1.72	1.49	1.04-1.94	Acceptable
MAPEP	4th /2015	12/3/2015	MAPEP-15-GrF33	Filter	Bq/sample	Gross Alpha	0.999	0.9	0.27-1.53	Acceptable

Table D-5 (cont'd)

GEL 2015 DEPARTMENT OF ENERGY MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP) RESULTS

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
MAPEP	4th/2015	12/3/2015	MAPEP-15-GrF33	Filter	Bq/sample	Gross Beta	1.57	1.56	0.78-2.34	Acceptable
MAPEP	4th/2015	12/3/2015	MAPEP-15-MaS33	Soil	Bq/Kg	Americium-241	61.7	49.5	34.7-64.4	Warning
MAPEP	4th/2015	12/3/2015	MAPEP-15-MaS33	Soil	Bq/Kg	Cesium-134	933	1010	707-1313	Acceptable
MAPEP	4th/2015	12/3/2015	MAPEP-15-MaS33	Soil	Bq/Kg	Cesium-137	861	809	566-1052	Acceptable
MAPEP	4th/2015	12/3/2015	MAPEP-15-MaS33	Soil	Bq/Kg	Cobalt-57	1240	1180	826-1534	Acceptable
MAPEP	4th/2015	12/3/2015	MAPEP-15-MaS33	Soil	Bq/Kg	Cobalt-60	2.45	1.3	Sens. Eval.	Acceptable
MAPEP	4th/2015	12/3/2015	MAPEP-15-MaS33	Soil	Bq/Kg	Iron-55	557	555	389-722	Acceptable
MAPEP	4th/2015	12/3/2015	MAPEP-15-MaS33	Soil	Bq/Kg	Manganese-54	1450	1340	938-1742	Acceptable
MAPEP	4th/2015	12/3/2015	MAPEP-15-MaS33	Soil	Bq/Kg	Nickel-63	625	682	477-887	Acceptable
MAPEP	4th/2015	12/3/2015	MAPEP-15-MaS33	Soil	Bq/Kg	Plutonium-238	100	97.5	68.3-126.8	Acceptable
MAPEP	4th/2015	12/3/2015	MAPEP-15-MaS33	Soil	Bq/Kg	Plutonium-239/240	76.7	80.4	56.3-104.5	Acceptable
MAPEP	4th/2015	12/3/2015	MAPEP-15-MaS33	Soil	Bq/Kg	Potassium-40	687	599	419-779	Acceptable
MAPEP	4th/2015	12/3/2015	MAPEP-15-MaS33	Soil	Bq/Kg	Strontium-90	403	425	298-553	Acceptable
MAPEP	4th/2015	12/3/2015	MAPEP-15-MaS33	Soil	Bq/Kg	Technetium-99	639	631	442-820	Acceptable
MAPEP	4th/2015	12/3/2015	MAPEP-15-MaS33	Soil	Bq/Kg	U-234/233	59	56	39-73	Acceptable
MAPEP	4th/2015	12/3/2015	MAPEP-15-MaS33	Soil	Bq/Kg	Uranium-238	208	220	154-286	Acceptable
MAPEP	4th/2015	12/3/2015	MAPEP-15-MaS33	Soil	Bq/Kg	Zinc-65	761	662	463-861	Acceptable
MAPEP	4th/2015	12/3/2015	MAPEP-15-MaW33	Water	Bq/L	Americium-241	1.03	1.055	0.739-1.372	Acceptable
MAPEP	4th/2015	12/3/2015	MAPEP-15-MaW33	Water	Bq/L	Cesium-134	21.2	23.1	16.2-30.0	Acceptable
MAPEP	4th/2015	12/3/2015	MAPEP-15-MaW33	Water	Bq/L	Cesium-137	0.00355		False Pos Test	Acceptable
MAPEP	4th/2015	12/3/2015	MAPEP-15-MaW33	Water	Bq/L	Cobalt-57	21	20.8	14.6-27.0	Acceptable
MAPEP	4th/2015	12/3/2015	MAPEP-15-MaW33	Water	Bq/L	Cobalt-60	17.5	17.1	12.0-22.2	Acceptable
MAPEP	4th/2015	12/3/2015	MAPEP-15-MaW33	Water	Bq/L	Hydrogen-3	212	216	151-281	Acceptable
MAPEP	4th/2015	12/3/2015	MAPEP-15-MaW33	Water	Bq/L	Iron-55	12.7	13.1	9.2-17.0	Acceptable
MAPEP	4th/2015	12/3/2015	MAPEP-15-MaW33	Water	Bq/L	Manganese-54	15.9	15.6	10.9-20.3	Acceptable
MAPEP	4th/2015	12/3/2015	MAPEP-15-MaW33	Water	Bq/L	Nickel-63	8.7	8.6	5.99-11.12	Acceptable
MAPEP	4th/2015	12/3/2015	MAPEP-15-MaW33	Water	Bq/L	Plutonium-238	0.607	0.681	0.477-0.885	Acceptable
MAPEP	4th/2015	12/3/2015	MAPEP-15-MaW33	Water	Bq/L	Plutonium-239/240	0.843	0.9	0.630-1.170	Acceptable
MAPEP	4th/2015	12/3/2015	MAPEP-15-MaW33	Water	Bq/L	Potassium-40	210	214	150-278	Acceptable
MAPEP	4th/2015	12/3/2015	MAPEP-15-MaW33	Water	Bq/L	Strontium-90	4.06	4.8	3.36-6.24	Acceptable
MAPEP	4th/2015	12/3/2015	MAPEP-15-MaW33	Water	Bq/L	Technetium-99	7.27	7.19	5.03-9.35	Acceptable
MAPEP	4th/2015	12/3/2015	MAPEP-15-MaW33	Water	Bq/L	Uranium-234/233	1.13	1.14	0.80-1.48	Acceptable
MAPEP	4th/2015	12/3/2015	MAPEP-15-MaW33	Water	Bq/L	Uranium-238	1.18	1.18	0.83-1.53	Acceptable
MAPEP	4th/2015	12/3/2015	MAPEP-15-MaW33	Water	Bq/L	Zinc-65	14.7	13.9	9.7-18.1	Acceptable
MAPEP	4th/2015	12/3/2015	MAPEP-15-GrW33	Water	Bq/L	Gross Alpha	0.425	0.429	0.129-0.729	Acceptable
MAPEP	4th/2015	12/3/2015	MAPEP-15-GrW33	Water	Bq/L	Gross Beta	3.59	3.52	1.76-5.28	Acceptable
MAPEP	4th/2015	12/3/2015	MAPEP-15-MaS33	Soil	Bq/Kg	Potassium-40	687	599	419-779	Acceptable

Table D-5 (cont'd)

GEL 2015 DEPARTMENT OF ENERGY MIXED ANALYTE PERFORMANCE EVALUATION PROGRAM (MAPEP) RESULTS

Notes:

False Pos Test – The MAPEP program uses false positive testing to identify laboratory results that indicate the presence of a particular radionuclide in a MAPEP sample when, in fact, the actual activity of the radionuclide is far below the detection limit of the measurement. Not Acceptable ("N") performance, and hence a false positive result, is indicated when the range encompassing the result, plus or minus the total uncertainty at three standard deviations, does not include zero (e.g., 2.5 +/- 0.2; range of 1.9 to 3.1). Statistically, the probability that a result can exceed the absolute value of its total uncertainty at three standard deviations by chance alone is less than 1%. MAPEP uses a three standard deviation criterion for the false positive test to ensure confidence about issuing a false positive performance evaluation. A result that is greater than three times the total uncertainty of the measurement represents a statistically positive detection with over 99% confidence.

Sens. Eval - Sensitivity evaluations are routinely performed to complement the false positive tests. In a sensitivity evaluation, the analyte is present at or near the detection limit, and the difference between the reported result and the MAPEP reference value is compared to the propagated combined total uncertainties. The results are evaluated at three standard deviations. If the observed difference is greater than three times the combined total uncertainty, the sensitivity evaluation is "Not Acceptable". The probability that such a difference can occur by chance alone is less than 1%. If the participant did not report a statistically positive result, a "Not-Detected" is noted in the text field of the MAPEP performance report. A non-detect is potentially a false negative result, dependent upon the laboratory's detection limit for the radionuclide.

Table D-6

2015 GEL ERA PROGRAM PERFORMANCE EVALUATION RESULTS

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
ERA	1st/2015	02/23/15	RAD-100	Water	pCi/L	Barium-133	73.2	67.6	56.4-74.4	Acceptable
ERA	1st/2015	02/23/15	RAD-100	Water	pCi/L	Cesium-134	51.9	51.3	41.3-56.4	Acceptable
ERA	1st/2015	02/23/15	RAD-100	Water	pCi/L	Cesium-137	142	124	112-139	Not Acceptable
ERA	1st/2015	02/23/15	RAD-100	Water	pCi/L	Cobalt-60	62.7	62.4	56.2-71.2	Acceptable
ERA	1st/2015	02/23/15	RAD-100	Water	pCi/L	Zinc-65	107	98.7	88.8-118	Acceptable
ERA	1st/2015	02/23/15	RAD-100	Water	pCi/L	Gross Alpha	67.2	62.3	32.6-77.3	Acceptable
ERA	1st/2015	02/23/15	RAD-100	Water	pCi/L	Gross Beta	43.2	48.9	33.1-56.0	Acceptable
ERA	1st/2015	02/23/15	RAD-100	Water	pCi/L	Gross Alpha	66.7	62.3	32.6-77.3	Acceptable
ERA	1st/2015	02/23/15	RAD-100	Water	pCi/L	Radium-226	16.1	16.8	12.5-19.2	Acceptable
ERA	1st/2015	02/23/15	RAD-100	Water	pCi/L	Radium-226	16.9	16.8	12.5-19.2	Acceptable
ERA	1st/2015	02/23/15	RAD-100	Water	pCi/L	Radium-226	16.8	16.8	12.5-19.2	Acceptable
ERA	1st/2015	02/23/15	RAD-100	Water	pCi/L	Radium-228	4.50	5.12	3.07-6.85	Acceptable
ERA	1st/2015	02/23/15	RAD-100	Water	pCi/L	Radium-228	7.40	5.12	3.07-6.85	Not Acceptable
ERA	1st/2015	02/23/15	RAD-100	Water	pCi/L	Uranium (Nat)	11.0	10.6	8.27-12.2	Acceptable
ERA	1st/2015	02/23/15	RAD-100	Water	ug/L	Uranium (Nat) mass	16.4	15.5	12.1-17.9	Acceptable
ERA	1st/2015	02/23/15	RAD-100	Water	pCi/L	Uranium (Nat)	11.3	10.6	8.27-12.2	Acceptable
ERA	1st/2015	02/23/15	RAD-100	Water	ug/L	Uranium (Nat) mass	17.1	15.5	12.1-17.9	Acceptable
ERA	1st/2015	02/23/15	RAD-100	Water	pCi/L	Tritium	10000	10600	9220-11700	Acceptable
ERA	1st/2015	02/23/15	RAD-100	Water	pCi/L	Strontium-89	47.3	52.1	41.2-59.6	Acceptable
ERA	1st/2015	02/23/15	RAD-100	Water	pCi/L	Strontium-90	26.7	32.4	23.7-37.5	Acceptable
ERA	1st/2015	02/23/15	RAD-100	Water	pCi/L	Strontium-89	54.6	52.1	41.2-59.6	Acceptable
ERA	1st/2015	02/23/15	RAD-100	Water	pCi/L	Strontium-90	24.6	32.4	23.7-37.5	Acceptable
ERA	2nd/2015	05/26/15	RAD-101	Water	pCi/L	Iodine-131	18.2	23.8	19.7-28.3	Not Acceptable
ERA	3rd/2015	08/25/15	RAD - 102	Water	pCi/L	Barium-133	63.9	64.7	53.9-71.2	Acceptable
ERA	3rd/2015	08/25/15	RAD - 102	Water	pCi/L	Cesium-134	45.2	50.1	40.3-55.1	Acceptable
ERA	3rd/2015	08/25/15	RAD - 102	Water	pCi/L	Cesium-137	90.5	89.9	80.8-101	Acceptable
ERA	3rd/2015	08/25/15	RAD - 102	Water	pCi/L	Cobalt-60	58.7	59.9	53.9-68.4	Acceptable
ERA	3rd/2015	08/25/15	RAD - 102	Water	pCi/L	Zinc-65	282	265	238-310	Acceptable
ERA	3rd/2015	08/25/15	RAD - 102	Water	pCi/L	Gross Alpha	37.1	34.5	17.7-44.5	Acceptable
ERA	3rd/2015	08/25/15	RAD - 102	Water	pCi/L	Gross Beta	26.2	25.1	15.6-33.1	Acceptable
ERA	3rd/2015	08/25/15	RAD - 102	Water	pCi/L	Gross Alpha	35.3	34.5	17.7-44.5	Acceptable
ERA	3rd/2015	08/25/15	RAD - 102	Water	pCi/L	Radium-226	15.9	15.2	11.3-17.4	Acceptable
ERA	3rd/2015	08/25/15	RAD - 102	Water	pCi/L	Radium-226	15.7	15.2	11.3-17.4	Acceptable
ERA	3rd/2015	08/25/15	RAD - 102	Water	pCi/L	Radium-226	15.1	15.2	11.3-17.4	Acceptable
ERA	3rd/2015	08/25/15	RAD - 102	Water	pCi/L	Radium-228	5.31	5.12	3.13-6.95	Acceptable
ERA	3rd/2015	08/25/15	RAD - 102	Water	pCi/L	Radium-228	5.14	5.12	3.13-6.95	Acceptable

Table D-6

2015 GEL ERA PROGRAM PERFORMANCE EVALUATION RESULTS

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
ERA	3rd/2015	08/25/15	RAD - 102	Water	pCi/L	Uranium (Nat)	24.2	24	19.3-27.0	Acceptable
ERA	3rd/2015	08/25/15	RAD - 102	Water	ug/L	Uranium (Nat) mass	37.9	35	28.1-39.4	Acceptable
ERA	3rd/2015	08/25/15	RAD - 102	Water	pCi/L	Uranium (Nat)	23.4	24	19.3-27.0	Acceptable
ERA	3rd/2015	08/25/15	RAD - 102	Water	ug/L	Uranium (Nat) mass	34.9	35	28.1-39.4	Acceptable
ERA	3rd/2015	08/25/15	RAD - 102	Water	pCi/L	Tritium	14500	15600	13600-17200	Acceptable
ERA	3rd/2015	08/25/15	RAD - 102	Water	pCi/L	Strontium-89	24.1	42.1	32.3-49.2	Not Acceptable
ERA	3rd/2015	08/25/15	RAD - 102	Water	pCi/L	Strontium-90	27.7	26.8	19.4-31.2	Acceptable
ERA	3rd/2015	08/25/15	RAD - 102	Water	pCi/L	Iodine-131	24.7	25.7	21.3-30.3	Acceptable
ERA	3rd/2015	11/23/15	RAD - 103	Water	pCi/L	Strontium-89	42	35.7	26.7-42.5	Acceptable
ERA	3rd/2015	11/23/15	RAD - 103	Water	pCi/L	Strontium-90	26.9	31.1	22.7-36.1	Acceptable
ERA	3rd/2015	11/23/15	RAD - 103	Water	pCi/L	Strontium-89	41.8	35.7	26.7-42.5	Acceptable
ERA	3rd/2015	11/23/15	RAD - 103	Water	pCi/L	Strontium-90	22	31.1	22.7-36.1	Not Acceptable

Table D-7

2015 GEL ERA PROGRAM (MRAD) PERFORMANCE EVALUATION RESULTS

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Actinium-228	1090	1250	802-1730	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Americium-241	1410	1500	878-1950	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Bismuth-212	1090	1780	474-2620	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Bismuth-214	4340	4430	2670-6380	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Cesium-134	6020	6390	4180-7680	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Cesium-137	1540	1490	1140-1920	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Cobalt-60	2010	1880	1270-2590	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Lead-212	1200	1230	806-1710	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Lead-214	4890	4530	2640-6760	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Manganese-54	<49.9	<1000	0-1000	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Plutonium-238	978	998	600-1380	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Plutonium-239	1240	1210	791-1670	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Potassium-40	10900	10700	7810-14400	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Strontium-90	1230	1940	740-3060	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Thorium-234	3840	3890	1230-7320	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Zinc-65	8030	7130	5680-9470	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Uranium-234	3754	3920	2400-5050	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Uranium-238	3565	3890	2410-4930	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Uranium-Total	7319	7990	4330-10500	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	ug/kg	Uranium-Total(mass)	8030	7130	5680-9470	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Uranium-234	4040	3920	2400-5050	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Uranium-238	4230	3890	2410-4930	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Uranium-Total	8477	7990	4330-10500	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	ug/kg	Uranium-Total(mass)	8030	7130	5680-9470	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Uranium-234	4480	3920	2400-5050	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Uranium-238	4020	3890	2410-4930	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	pCi/kg	Uranium-Total	8683	7990	4330-10500	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	ug/kg	Uranium-Total(mass)	12000	7130	5680-9470	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Soil	ug/kg	Uranium-Total(mass)	12800	11600	6390-14600	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Uranium-234	3480	3150	2070-4050	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Uranium-238	3090	3130	2090-3980	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Uranium-Total	6716	6420	4350-7990	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	ug/kg	Uranium-Total(mass)	9370	6280-11900	3540-6710	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Am-241	5130	4340	2650-5770	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Cesium-134	2210	2650	1700-3440	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Cesium-137	1790	1810	1310-2520	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Cobalt-60	1570	1540	1060-2150	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Curium-244	1370	1360	666-2120	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Manganese-54	<31.1	<300	0-300	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Plutonium-238	4700	3680	2190-5040	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Plutonium-239	5120	4180	2570-5760	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Potassium-40	33100	30900	22300-43400	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Strontium-90	5920	6590	3760-8740	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Uranium-234	3230	3150	2070-4050	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Uranium-238	3340	3130	2090-3980	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Uranium-Total	6742	6420	4350-7990	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	ug/kg	Uranium-Total(mass)	10000	9370	3540-6710	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	ug/kg	Uranium-Total(mass)	8780	5280	3540-6710	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Uranium-Total	8780	6420	4350-7990	Not Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Vegetation	pCi/kg	Zinc-65	1250	1090	786-1530	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Americium-241	50.2	49.8	30.7-67.4	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Cesium-134	951	909	578-1130	Acceptable

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2015 GEL ERA PROGRAM (MRAD) PERFORMANCE EVALUATION RESULTS

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Cesium-137	1320	1170	879-1540	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Cobalt-60	87.6	79.1	61.2-98.8	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Iron-55	879	836.0	259-1630	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Manganese-54	<6.09	<50	0.00-50.0	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	ug/Filter	Plutonium-238	57.1	52.1	35.7-68.5	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Plutonium-239	46.0	40.3	29.2-52.7	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Strontium-90	84.6	96.6	47.2-145	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Uranium-234	34.7	34.3	21.3-51.7	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Uranium-238	34.5	34.0	17.8-38.2	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Uranium-Total	70.9	69.9	38.7-106	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	ug/Filter	Uranium-Total(mass)	103	102	65.3-144	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Zinc-65	1190	986	706-1360	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Uranium-234	39.2	34.3	21.3-51.7	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Uranium-238	34.9	34.0	17.8-38.2	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Uranium-Total	75.7	69.9	38.7-106	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	ug/Filter	Uranium-Total(mass)	105	102	65.3-144	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	ug/Filter	Uranium-Total(mass)	95.5	102	52.9-116	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Gross Alpha	77.2	62.2	20.8-96.6	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Filter	pCi/Filter	Gross Beta	62.7	58.4	36.9-85.1	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Americium-241	48.5	46.0	31.0-61.7	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Cesium-134	1180	1260	925-1450	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Cesium-137	1410	1360	1150-1630	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Cobalt-60	1280	1250	1090-1460	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Iron-55	1080	1070	638-1450	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Manganese-54	<5.41	<100	0.00-100	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Plutonium-238	81.0	72.4	53.6-90.1	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Plutonium-239	205	184	143-232	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Strontium-90	865	912	594-1210	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Uranium-234	68.5	61.8	46.4-79.7	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Uranium-238	71.8	61.3	46.7-75.2	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Uranium-Total	140	126	92.6-163	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	ug/L	Uranium-Total(mass)	214	184	147-222	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Zinc-65	1310	1180	984-1490	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Uranium-234	60.7	61.8	46.4-79.7	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Uranium-238	58.0	61.3	46.7-75.2	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Uranium-Total	121	126	92.6-163	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	ug/L	Uranium-Total(mass)	174	184	147-222	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Uranium-234	64.1	61.8	46.4-79.7	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Uranium-238	60.4	61.3	46.7-75.2	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Uranium-Total	127	126	92.6-163	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	ug/L	Uranium-Total(mass)	181	184	147-222	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	ug/L	Uranium-Total(mass)	176	184	147-222	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Gross Alpha	128	119	42.2-184	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Gross Beta	155.0	158.0	90.5-234	Acceptable
ERA	2nd/2015	05/19/15	MRAD-22	Water	pCi/L	Tritium	10600	10300	6900-14700	Acceptable
ERA	2nd/2015	05/26/15	MRAD-22	Water	pCi/L	Iodine-131	23.5	23.8	19.7-28.3	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Soil	pCi/kg	Actinium-228	1220	1240	795-1720	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Soil	pCi/kg	Americium-241	667	539	315-700	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Soil	pCi/kg	Bismuth-212	1240	1240	330-1820	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Soil	pCi/kg	Bismuth-214	1690	2660	1600-3830	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Soil	pCi/kg	Cesium-134	2250	2420	1580-2910	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Soil	pCi/kg	Cesium-137	5400	5120	3920-6590	Acceptable

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2015 GEL ERA PROGRAM (MRAD) PERFORMANCE EVALUATION RESULTS

PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
ERA	3rd/2015	11/24/15	MRAD-23	Soil	pCi/kg	Cobalt-60	4290	3900	2640-5370	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Soil	pCi/kg	Lead-212	1290	1240	812-1730	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Soil	pCi/kg	Lead-214	2090	2800	1630-4180	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Soil	pCi/kg	Manganese-54	<29.7	<1000	0-1000	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Soil	pCi/kg	Plutonium-238	934	864	519-1190	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Soil	pCi/kg	Plutonium-239	982	969	633-1340	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Soil	pCi/kg	Potassium-40	11700	10600	7740-14200	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Soil	pCi/kg	Strontium-90	7490	8820	3360-13900	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Soil	pCi/kg	Thorium-234	3760	3330	1050-6260	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Soil	pCi/kg	Zinc-65	4610	3620	2880-4810	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Soil	pCi/kg	Uranium-234	2659	3360	2050-4310	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Soil	pCi/kg	Uranium-238	2831	3330	2060-4220	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Soil	pCi/kg	Uranium-Total	5490	6850	3720-9040	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Soil	ug/kg	Uranium-Total(mass)	8420	9990	5510-12600	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Soil	pCi/kg	Uranium-234	2970	3360	2050-4310	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Soil	pCi/kg	Uranium-238	3010	3330	2060-4220	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Soil	pCi/kg	Uranium-Total	6091	6850	3720-9040	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Soil	ug/kg	Uranium-Total(mass)	8990	9990	5510-12600	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Soil	ug/kg	Uranium-Total(mass)	8470	9990	5510-12600	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Vegetation	pCi/kg	Am-241	1780	1590	972-2110	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Vegetation	pCi/kg	Cesium-134	652	748	481-972	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Vegetation	pCi/kg	Cesium-137	1140	1230	892-1710	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Vegetation	pCi/kg	Cobalt-60	1870	1930	1330-2700	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Vegetation	pCi/kg	Curium-244	2910	3230	1580-5030	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Vegetation	pCi/kg	Manganese-54	<45.2	<300	0-300	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Vegetation	pCi/kg	Plutonium-238	4720	3920	2340-5370	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Vegetation	pCi/kg	Plutonium-239	2630	2390	1470-3290	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Vegetation	pCi/kg	Potassium-40	31200	31000	22400-43500	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Vegetation	pCi/kg	Strontium-90	7590	7160	4080-9490	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Vegetation	pCi/kg	Uranium-234	4280	4010	2640-5150	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Vegetation	pCi/kg	Uranium-238	4620	3970	2650-5040	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Vegetation	pCi/kg	Uranium-Total	9155	8160	5530-10200	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Vegetation	ug/kg	Uranium-Total(mass)	13900	11900	3540-6710	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Vegetation	ug/kg	Uranium-Total(mass)	13100	11900	7970-15100	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Vegetation	pCi/kg	Zinc-65	1530	1540	1110-2160	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Filter	pCi/Filter	Americium-241	35.1	36.8	22.7-49.8	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Filter	pCi/Filter	Cesium-134	315	349.0	222-433	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Filter	pCi/Filter	Cesium-137	598	613	461-805	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Filter	pCi/Filter	Cobalt-60	509	521	403-651	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Filter	pCi/Filter	Iron-55	546	595.0	184-1160	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Filter	pCi/Filter	Manganese-54	<4.53	<50	0.00-50.0	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Filter	ug/Filter	Plutonium-238	43.6	42.6	29.2-56.0	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Filter	pCi/Filter	Plutonium-239	63.6	63.8	46.2-83.4	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Filter	pCi/Filter	Strontium-90	37.1	45.7	22.3-68.5	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Filter	pCi/Filter	Uranium-234	38.4	43.0	26.7-64.8	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Filter	pCi/Filter	Uranium-238	39.3	42.7	27.6-59.0	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Filter	pCi/Filter	Uranium-Total	80.1	87.7	48.6-133	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Filter	ug/Filter	Uranium-Total(mass)	118	128	81.9-180	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Filter	pCi/Filter	Zinc-65	727	685	491-946	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Filter	pCi/Filter	Uranium-234	45.7	43.0	26.7-64.8	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Filter	pCi/Filter	Uranium-238	43.4	42.7	27.6-59.0	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Filter	pCi/Filter	Uranium-Total	91.1	87.7	48.6-133	Acceptable

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PT Provider	Quarter / Year	Report Date	Sample Number	Sample Media	Unit	Analyte / Nuclide	GEL Value	Known value	Acceptance Range/ Ratio	Evaluation
ERA	3rd/2015	11/24/15	MRAD-23	Filter	ug/Filter	Uranium-Total(mass)	130	128	81.9-180	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Filter	ug/Filter	Uranium-Total(mass)	117	128	81.9-180	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Filter	pCi/Filter	Gross Alpha	98	77.3	25.9-120	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Filter	pCi/Filter	Gross Beta	52.2	41.3	26.1-60.2	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Water	pCi/L	Americium-241	114	113	76.1-152	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Water	pCi/L	Cesium-134	702	759	557-872	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Water	pCi/L	Cesium-137	622	623	529-747	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Water	pCi/L	Cobalt-60	927	896	778-1050	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Water	pCi/L	Iron-55	196	212	126-288	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Water	pCi/L	Manganese-54	<6.14	<100	0.00-100	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Water	pCi/L	Plutonium-238	117	140	104-174	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Water	pCi/L	Plutonium-239	88.5	114	88.5-144	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Water	pCi/L	Strontium-90	505	544	354-719	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Water	pCi/L	Uranium-234	49.2	48.5	36.4-62.6	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Water	pCi/L	Uranium-238	49.7	48.1	36.7-59.0	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Water	pCi/L	Uranium-Total	98.9	98.9	72.7-128	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Water	ug/L	Uranium-Total(mass)	148	144	115-174	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Water	pCi/L	Zinc-65	786	712	594-898	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Water	pCi/L	Uranium-234	45.8	48.5	36.4-62.6	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Water	pCi/L	Uranium-238	44.4	48.1	36.7-59.0	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Water	pCi/L	Uranium-Total	92.8	98.9	72.7-128	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Water	ug/L	Uranium-Total(mass)	135.0	144.0	115-174	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Water	pCi/L	Uranium-234	49.5	48.5	36.4-62.6	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Water	pCi/L	Uranium-238	43.1	48.1	36.7-59.0	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Water	pCi/L	Uranium-Total	95	98.9	72.7-128	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Water	ug/L	Uranium-Total(mass)	129	144	115-174	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Water	ug/L	Uranium-Total(mass)	135	144	115-174	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Water	pCi/L	Gross Alpha	104.0	136	48.3-211	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Water	pCi/L	Gross Beta	61.6	53.7	30.7-79.6	Acceptable
ERA	3rd/2015	11/24/15	MRAD-23	Water	pCi/L	Tritium	20500	21500	14400-30700	Acceptable