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

APR 15 2009

LR-N09-0095

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

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

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

Subject: 2008 Annual Radiological Environmental Operating Report

As required by Section 6.9.1.7 of Appendix A to 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 the Operating License NPF-57 for Hope Creek Generating Station, PSEG Nuclear hereby transmits one copy of the 2008 Annual Radiological Environmental Operating Report. This report summarizes the results of the radiological environmental surveillance program for 2008 in the vicinity of the Salem and Hope Creek Generating Stations. The result of this program for 2008 was specifically compared to the result of the pre-operational program.

There are no regulatory commitments contained in this correspondence.

IE25
NRR

If you have any questions or comments on this transmittal, please contact Jon Sears at (856) 339-1773.

Sincerely,

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Attachment - 2008 Annual Radiological Environmental Operating Report

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RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

For

Salem Generating Station, Unit 1: Docket No. 50-272
Salem Generating Station, Unit 2: Docket No. 50-311
Hope Creek Generating Station : Docket No. 50-354

2008 ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT JANUARY 1 TO DECEMBER 31, 2008

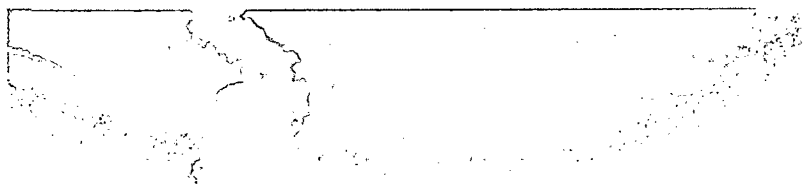
Prepared by

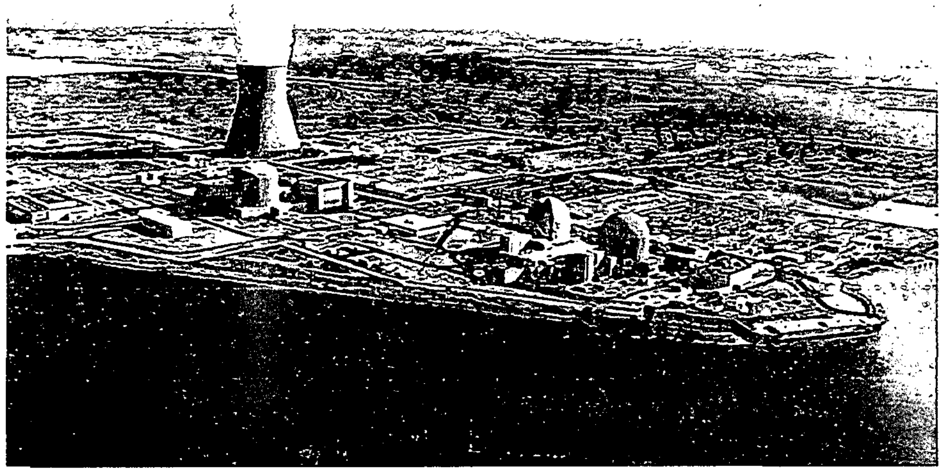
PSEG POWER LLC

MAPLEWOOD TESTING SERVICES

APRIL 2009

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM





SALEM & HOPE CREEK
GENERATING STATIONS

2008 ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

JANUARY 1 TO DECEMBER 31, 2008

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SUMMARY

During normal operations of a nuclear power generating station there are releases of small amounts of radioactive material to the environment. To monitor and determine the effects of these releases a Radiological Environmental Monitoring Program (REMP) has been established for the environment around Artificial Island where the Salem Generating Station (SGS) and Hope Creek Generating Station (HCGS) are located. The results of the REMP are published annually, providing a summary and interpretation of the data collected [10].

PSEG's Maplewood Testing Services (MTS) has been responsible for the collection and analysis of environmental samples during the period of January 1, 2008, through December 31, 2008, and the results are discussed in this report. The REMP was conducted in accordance with the SGS and HCGS Technical Specifications (TS) and Offsite Dose Calculation Manual (ODCM) [14,15]. The Lower Limit of Detection (LLD) values required by the Technical Specifications and ODCM were achieved for the 2008 reporting period. The REMP objectives were also met during this period. The data that was collected in 2008 assists in demonstrating that SGS and HCGS were operated in compliance with Technical Specifications and ODCM.

Most of the radioactive materials noted in this report are normally present in the environment, either naturally, such as potassium-40, or as a result of non-nuclear generating station activity, such as nuclear bomb testing. Measurements made in the vicinity of SGS/HCGS were compared to background or control measurements and the preoperational REMP study performed before Salem Unit 1 became operational. Samples of air particulates; air iodine; milk; surface, ground and drinking water; vegetables; fodder crops; fish; crabs; and sediment were collected and analyzed. External radiation dose measurements were also made in the vicinity of SGS/HCGS using thermoluminescent dosimeters (TLD).

From the results obtained, it can be concluded that the levels and fluctuations of radioactivity in environmental samples were as expected for an estuarine environment.

The concentration of radioactive material in the environment that could be attributable to Salem and Hope Creeks stations operations was only a small fraction of the concentration of naturally occurring and man-made radioactivity. Since these results were comparable to the results obtained during the preoperational phase of the program [7,8,9], and with historical results collected since commercial operation [10], we can conclude that the operation of SGS and HCGS had no significant radiological impact on the environment.

To demonstrate compliance with Technical Specifications and ODCM (Sections 3/4.12.1 & 6.8.4.h -1,2,3) [14,15], samples were analyzed for one or more of the following: gamma emitting isotopes, tritium (H-3), iodine-131 (I-131), gross beta and gross alpha. The results of these analyses were used to assess the environmental impact of SGS and HCGS operations, thereby demonstrating compliance with Technical Specifications and ODCM (Section 3/4.11) and applicable Federal and State regulations [19,20,21], and to verify the adequacy of radioactive effluent control systems. The results provided in this report are summarized below:

- There were a total of 1221 analyses on 865 environmental samples during 2008. Direct radiation dose measurements were made using 196 thermoluminescent dosimeters (TLDs).

- In addition to the detection of naturally - occurring isotopes (i.e. Be-7, K-40, Radium and Th-232) trace levels of H-3 were also detected in surface water. The tritium concentration in these surface water samples was slightly above minimum detectable concentrations.

- Dose measurements made with quarterly TLDs at offsite locations around the SGS/HCGS site averaged 52 millirems for the year 2008. The average of the dose measurements at the control locations (background) was 54 millirems for the year. This was comparable to the levels prior to station operation which had an average of 55 millirems per year for 1973 to 1976.

Appendix F contains the annual report on the status of the Radiological Groundwater Protection program (RGPP) conducted at Salem and Hope Creek Stations. The RGPP was initiated by PSEG to determine whether groundwater at and in the vicinity of Salem and Hope Creek Stations had been adversely impacted by any release of radionuclides that was not previously identified. The RGPP is being implemented by PSEG in conjunction with a nuclear industry initiative and associated guidance.

Salem

- The 2008 results of the laboratory analysis indicated that tritium was detected in five of thirteen RGPP monitoring wells at Salem and all results were less than 1000 pCi/L.

Hope Creek

- The 2008 results of the laboratory analysis indicated that tritium was detected in six of thirteen RGPP monitoring wells at Hope Creek and all results were less than 1000 pCi/L.

The results are shown in Appendix F, in Tables 4A and 4B. The tritium concentrations measured in the onsite monitoring wells were below the U.S. Nuclear Regulatory Commission Reporting Levels.

PSEG Nuclear is continuing remedial actions for tritium identified in shallow groundwater at Salem Station, conducted in accordance with a Remedial Action Work Plan that was approved by the New Jersey Department of Environmental Protection – Bureau of Nuclear Engineering (NJDEP-BNE) in November 2004. The Groundwater Recovery System (GRS) is in operation, providing hydraulic control of the plume and effectively removing tritium contaminated groundwater. The tritium contaminated groundwater is disposed of in accordance with Salem Station's liquid radioactive waste disposal program. There is no evidence or indication that tritium contaminated water above Ground Water Quality Criteria (GWQC) levels [GWQC is <20,000 pCi/L] has migrated to the station boundary or the Delaware River.

THE RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

Lower Alloways Creek Township, Salem County, New Jersey is the site of Salem (SGS) and Hope Creek (HCGS) Generating Stations. SGS consists of two operating pressurized water nuclear power reactors. Salem Unit One has a net rating of 1195 megawatt electric(MWe) and Salem Unit Two has a net rating of 1196 MWe. The licensed core power for both units is 3459 megawatt thermal (MWt). HCGS is a boiling water nuclear power reactor, which has a net rating of 1265 MWe (3840 MWt).

SGS/HCGS are located on a man-made peninsula on the east bank of the Delaware River. It was created by the deposition of hydraulic fill from dredging operations. The environment surrounding SGS/HCGS is characterized mainly by the Delaware River Estuary and Bay, extensive tidal marshlands, and low-lying meadowlands. These land types make up approximately 85% of the land area within five miles of the site. Most of the remaining land is used for agriculture [1,2]. More specific information on the demography, hydrology, meteorology, and land use of the area may be found in the Environmental Reports [1,2], Environmental Statements [3,4], and the Updated Final Safety Analysis Reports for SGS and HCGS [5,6].

Since 1968, a radiological environmental monitoring program (REMP) has been conducted at the SGS/HCGS Site. Starting in December, 1972, more extensive radiological monitoring programs were initiated [7,8,9]. The operational REMP was initiated in December, 1976, when Salem Unit 1 achieved criticality. PSEG's Maplewood Testing Services (MTS) has been involved in the REMP since its inception. MTS is responsible for the collection of all radiological environmental samples and, from 1973 through June, 1983, conducted a quality assurance program in which duplicates of a portion of those samples analyzed by the primary laboratory were also analyzed by MTS.

From January, 1973, through June, 1983, Radiation Management Corporation (RMC) had primary responsibility for the analysis of all samples under the SGS/HCGS REMP and annual reporting of results.

RMC reports for the preoperational and operational phase of the program are referenced in this report [7-9]. On July 1, 1983, MTS assumed primary responsibility for the analysis of all samples (except TLDs) and the reporting of results. Teledyne Brown Engineering Environmental Services (TBE), assumed responsibility for third-party QA analyses and TLDs. An additional vendor, Controls for Environmental Pollution Inc. (CEP), was retained to provide third-party QA analyses and certain non-routine analyses from May, 1988, until June 1, 1992. Currently, AREVA NP, Inc. Environmental Laboratory (AREVA) is the third party QA vendor and the laboratory which performs the TLD analyses. MTS reports for the operational phase from 1983 to 2007 are referenced in this report [10].

An overview of the 2008 REMP is provided in Table 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. Differences between these periods were examined statistically to determine the effects of station operations. This report presents the results from January 1 through December 31, 2008, for the SGS/HCGS REMP.

OBJECTIVES

The objectives of the operational REMP are:

- To fulfill the requirements of the Radiological Surveillance sections of the Technical Specifications and ODCM for SGS/HCGS.

- To determine whether any significant increase occurred in the concentration of radionuclides in critical pathways.

- To determine if SGS or HCGS has caused an increase in the radioactive inventory of long-lived radionuclides.

- To detect any change in ambient gamma radiation levels.

- To verify that SGS and HCGS operations have no detrimental effects on the health and safety of the public or on the environment.

This report, as required by Section 6.9.1.7 of the Salem Technical Specifications [12] and ODCM [14] and Section 6.9.1.6 of the Hope Creek Technical Specifications [13] and ODCM [15], summarizes the findings of the 2008 REMP. Results from the formal 1973 through 1976 preoperational program were summarized by RMC and have been used for comparison with subsequent operational reports [8].

In order to meet the objectives, an operational REMP was developed. Samples of various media were selected for monitoring due to the radiological dose impact to human and other organisms. The selection of samples was based on: (1), established critical pathways for the transfer of radionuclides through the environment to man, and, (2), experience gained during the preoperational phase. Sampling locations were determined based on site meteorology, Delaware estuarine hydrology, local demography, and land uses.

Sampling locations were divided into two classes, indicator and control. Indicator stations are those which are expected to manifest station effects. Control samples are collected at locations which are believed to be unaffected by station operations, usually at 15 to 30 kilometers distance. 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.

Appendix A, Program Summary, describes and summarizes the analytical results in accordance with Section 6.9.1.7 of the Salem TS and Section 6.9.1.6 of the Hope Creek TS [25,26,27]. Appendix B, Sample Designation, describes the coding system which identifies sample type and location. Table B-1 On-site Sampling Locations lists the station codes, stations location, latitude, longitude, and the types of samples collected at each station.

These sampling stations are indicated on Maps B-1, Onsite Sampling Locations and B-2, Offsite Sampling Locations.

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 U.S. Nuclear Regulatory Commission Regulatory Guide 4.8, 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". LLD is normally calculated as 4.66 times the standard deviation of the background counting rate, or of the blank sample count, as appropriate, divided by counting efficiency, sample size, 2.22 (dpm per picocurie), the radiochemical yield when applicable, the radioactive decay constant and the elapsed time between sample collection and time of counting. The Minimum Detectable Concentration (MDC) is defined as the smallest concentration of radioactive material that can be detected at a given confidence level. The MDC differs from the LLD in that the MDC takes into consideration the interference caused by the presence of other nuclides while the LLD does not.

The grouped data were averaged and standard deviations calculated in accordance with Appendix B of Reference 16. Thus, the 2 sigma deviations of the averaged data represent sample and not analytical variability. For reporting and calculation of averages, any result occurring at or below the LLD is considered to be at that level. When a group of data was composed of 50% or more LLD values, averages were not calculated.

QUALITY ASSURANCE PROGRAM

MTS has a quality assurance program designed to ensure confidence in the analytical program. Approximately 10 -15% of the total analytical effort is spent on quality control, including process quality control, instrument quality control, interlaboratory cross-check analyses, and data review/evaluation.

The quality of the results obtained by MTS is ensured by the implementation of the Quality Assurance Program as described in the Maplewood Testing Services Quality Assurance Plan [11a], the Maplewood Testing Services Mechanical Division Quality Assurance Plan [11b], and the Maplewood Testing Services Mechanical Division Environmental/Radiological Group Procedure Manual [11c].

The internal quality control activity of MTS includes the quality control of instrumentation, equipment and reagents, the use of reference standards in calibration, documentation of established procedures and computer programs, analysis of blank samples, and analysis of duplicate samples. The external quality control activity is implemented through participation in the Analytics Environmental Cross Check (ECC), AREVA and the Environmental Resource Associates (ERA) Interlaboratory Comparison Programs. MTS's internal QC results are evaluated in accordance with the NRC Resolution Criteria [18]. This criteria is also used for the Analytics Environmental Crosscheck Program results. ERA's RadCheM™ Proficiency Testing (PT) studies have been evaluated by comparing MTS results to the acceptance limits and evaluation criteria contained in the NELAC standards, National Environmental Laboratory Accreditation Conference (NELAC) PT Field of Testing list (October 2007). (The results of these three Interlaboratory Comparison Programs are listed in Tables D-1 through D-4 in Appendix D).

A total of 89 analysis results were obtained in the Cross Check, Interlaboratory Comparison and Proficiency Testing programs. Eighty-four (84) passed the applicable criteria, this translates to a 94% acceptance rate.

The five medias and analysis which disagreed with the criteria were: water/gross beta, water/gross alpha, air particulate/ Cr-51 Gamma Spec, air particulate/ Mn-54 Gamma Spec and air particulate/ Fe-59 Gamma Spec. The cause for these disagreements and the corrective actions are provided below.

The result disagreement for the gross beta analysis and gross alpha analysis for the Analytics ECC water was attributed to intermittent count (data) reproducibility problems with our Series 5XLB gas proportional counter. A field service technician was called in. The resolution, a new computer model was installed with the latest version (v3.1.2) of the Eclipse LB software and firmware.

The results disagreement for the gamma spec results on the Analytics air filter are attributable to a combination of uneven mixed standard distribution on the calibration filter prepared by MTS, and geometry differences in the active area on Analytics ECC air filter. The MTS resolution is to have Analytics prepare both a mixed gamma APT filter standard and the ECC filter for analysis in the same 47 mm geometry used by MTS.

The Quality Assurance program for environmental TLDs includes independent third party performance testing by the Pacific Northwest National Laboratory and internal performance testing conducted by the AREVA Laboratory Quality Assurance Officer.

Under these programs, sets of six dosimeters are irradiated to ANSI N545, Performance Testing and Procedural Specifications for Thermoluminescent Dosimetry (Environmental) [29], and submitted for processing as "unknowns." The bias and precision of TLD processing is measured against the guidance in U. S. Nuclear Regulatory Commission Regulatory Guide 4.13 Performance, Testing, and Procedural Specifications for Thermoluminescence Dosimetry: Environmental Applications [23] and is trended over time to indicate changes in TLD processing performance.

The AREVA Lab conducted internal performance tests in 2008. These tests were conducted on fifteen separate sets of six environmental dosimeters. All of the fifteen TLD test sets passed the mean bias criteria of ±20.1%.

Of the ninety individual measurements, all of the individual dosimeter evaluations met the E-LAB Internal Acceptance Criteria for bias (±20.1%) and precision (±12.8) (see Table D-5).

The Pacific Northwest National Laboratory performed third party performance tests for the AREVA Lab. The third party dosimeters were irradiated and analyzed along with second and fourth quarter client dosimeters. Both sets of six dosimeters passed the mean bias criteria of ±20.1%. All twelve dosimeter evaluations met the E-LAB individual acceptance criteria for bias (±20.1%) and precision (±12.8) (see Table D-6).

RESULTS AND DISCUSSION

The analytical results of the 2008 REMP samples are divided into categories based on exposure pathways: atmospheric, direct, terrestrial, and aquatic. The analytical results for the 2008 REMP are summarized in Appendix A, Program Summary. The data for individual samples are presented in Appendix C, Data Tables. The data are compared to the formal pre-operational environmental monitoring program data (1973-1976) and to historical data. The data collected demonstrates that the SGS and HCGS REMP was conducted in compliance with the Technical Specifications and ODCM.

The REMP for the SGS/HCGS Site has historically included samples and analyses not specifically required by these Stations' Technical Specifications and ODCM. These analyses are referenced throughout the report as Management Audit samples. MTS continues to collect and analyze these samples in order to maintain personnel proficiency in performing these non-routine analyses. The summary tables in this report include these additional samples and analyses.

ATMOSPHERIC

Air particulates were collected on Schleicher-Schuell No. 25 glass fiber filters with low-volume air samplers.

Iodine was collected from the air by adsorption on triethylene-diamine (TEDA) impregnated charcoal cartridges connected in series after the air particulate filters. Air sample volumes were measured with calibrated dry-gas meters. The displayed volumes were corrected to standard temperature and pressure.

Air Particulates (Tables C-1, C-2)

Air particulate samples were collected weekly, at 6 locations. Each of the samples (see Program Deviations) collected for the year were analyzed for gross beta. Quarterly composites of the weekly samples from each station were analyzed for specific gamma emitters. Total air sampler availability for the 6 sampling stations in 2008 was 98.7 percent.

- Gross beta activity was detected in all of the indicator station samples collected at concentrations ranging from 7.0×10^{-3} to 57×10^{-3} pCi/m^3 and in all of the control station samples from 8.9×10^{-3} to 51×10^{-3} pCi/m^3. The average for both the indicator and control station samples was 22×10^{-3} pCi/m^3. The maximum preoperational level detected was 920×10^{-3} pCi/m^3, with an average of 74×10^{-3} pCi/m^3. Results for gross beta analysis from 1988 to current year are plotted on Figure 1 as quarterly averages. Included along with this plot, for purposes of comparison, is an inset depicting a continuation of this plot from the current year all the way back to 1973.

- Gamma spectroscopy, performed on each of the 24 quarterly composite samples analyzed, indicated the presence of the naturally-occurring radionuclides Be-7, K-40 and RA-NAT. All other gamma emitters searched for in the nuclide library used by nuclear plants were below the minimum detectable concentration.

- Beryllium-7, attributed to cosmic ray activity in the atmosphere, was detected in all 20 indicator station composites that were analyzed, at concentrations ranging from 63 x 10^{-3} to 102 x 10^{-3} pCi/m^3, with an average of 81 x 10^{-3} pCi/m^3. It was detected in the 4 control station composites ranging from 62 x 10^{-3} to 95 x 10^{-3} pCi/m^3, with an average of 80 x 10^{-3} pCi/m^3. The maximum preoperational level detected was 330 x 10^{-3} pCi/m^3, with an average of 109 x 10^{-3} pCi/m^3.

- Potassium-40 activity was detected in all 20 of the indicator station samples, with concentrations ranging from 8.0 x 10^{-3} to 17 x 10^{-3} pCi/m^3, and an average of 11 x 10^{-3} pCi/m^3. K-40 was also detected in all 4 control station samples, at concentrations of 8.0 X 10^{-3} to 11 x 10^{-3} and an average of 10 X 10^{-3}. No preoperational data is available for comparison.

- RA-NAT was only detected in 3 indicator station samples at concentrations ranging from 0.8 to 1.1 X 10^{-3} pCi/L, with an average of 1 X 10^{-3} pCi/L. It was not detected in any of the control station samples. No preoperational data is available for comparison.

Air Iodine (Table C-3)

Iodine in filtered air samples was collected weekly, at 6 locations. Each of the samples collected (see Program Deviations) for the year was analyzed for I-131.

Iodine-131 was not detected above minimum detectable concentrations in any of the weekly samples analyzed. Minimum detectable concentrations for all the stations, both indicator and control, ranged from <1.0 x 10^{-3} to <8.5 x 10^{-3} pCi/m^3. The maximum preoperational level detected was 42 x 10^{-3} pCi/m^3.

DIRECT RADIATION

Ambient radiation levels in the environs were measured with a pair of Panasonic thermoluminescent dosimeters (TLDs) supplied and read by AREVA NP E-Lab. Packets containing TLDs for quarterly exposure were placed in the owner-controlled area and around the Site at various distances and in each land based meteorological sector. Emphasis was placed on special interest areas such as population centers, nearby residences, and schools.

Direct Radiation (Table C-4)

A total of 49 locations were monitored for direct radiation during 2008, including 12 on-site locations, 31 off-site locations within the 10 mile zone, and 6 control locations beyond 10 miles.

Each location gets a pair of Panasonic TLDS packaged together. This pair consist of 1 UD-801 TLD which contains 2 lithium and 2 calcium elements and 1 UD-814 TLD which contains 1 lithium and 3 calcium elements. To calculate the stations exposure, AREVA averages the 5 calcium elements to obtain a more statistically valid result. Then they perform a T test to identify any outliers. These outliers are removed and would reduce the number of elements used. For these measurements, the rad is considered equivalent to the rem, in accordance with 10CFR20.1004.

The average dose rate for the 31 quarterly off-site indicator TLDs was 4.3 millirads per standard month, while the on-site average was 4.2 millirads per standard month. The average control rate was similar at 4.5 millirads per standard month. The preoperational average for the quarterly TLD readings was 4.4 millirads per standard month.

In Figure 2, the quarterly average radiation levels of the off-site indicator stations versus the control stations, are plotted for the period 1988 through 2008, with an inset graph depicting the current year back to 1973.

The results of the direct radiation measurements for 2008 confirmed that the radiation levels in the vicinity of the Salem and Hope Creek Generating Stations were similar to previous years.

TERRESTRIAL

Milk samples were taken semi-monthly when cows were on pasture and monthly when cows were not grazing on open pasture. Animals are considered on pasture from April to November of each year. Samples were collected in polyethylene containers and transported in ice chests with no preservatives added to the milk.

A well water sample was collected monthly. Separate raw and treated potable water samples were composited daily at the City of Salem Water and Sewer Department. All samples were collected in new polyethylene containers.

Locally grown vegetable and fodder crops were collected at the time of harvest with the exception of ornamental cabbage. MTS personnel planted, maintained and harvested this broad leaf crop in the fall from three locations on site and one across the river. All samples were weighed and packed in plastic bags.

Milk (Table C-5)

Milk samples were collected at 4 local dairy farms (2 farms in NJ and 2 in Delaware). Each sample was analyzed for I-131 and gamma emitters.

- Iodine-131 was not detected above minimum detectable concentration in any of the 80 samples analyzed. LLD's for both the indicator and the control station samples ranged from <0.1 to 0.3 pCi/L.

The maximum preoperational level detected was 65 pCi/L which occurred following a period of atmospheric nuclear weapons tests. Results from 1988 to 2008 are plotted on Figure 3, with an inset graph depicting the current year back to 1973.

- Gamma spectroscopy performed on each of the 80 samples indicated the presence of the naturally-occurring radionuclides K-40 and RA-NAT. All other gamma emitters searched for in the nuclide library used by nuclear plants were below the minimum detectable concentration.

  - Potassium-40 was detected in all 80 samples. Concentrations for the 60 indicator station samples ranged from 1120 to 1470 pCi/L, with an average of 1340 pCi/L. The 20 control station sample concentrations ranged from 1200 to 1390 pCi/L, with an average of 1290 pCi/L. The maximum preoperational level detected was 2000 pCi/L, with an average of 1437 pCi/L.

  - RA-NAT was detected in only one of the indicator station samples at a concentration of 113 pCi/L. It was not detected above the minimum detectable concentration in any of the control station samples. The preoperational had an average of 3.8 pCi/L and a range of 1.5 to 11 pCi/L.

Well Water (Ground Water) (Tables C-6, C-7)

Although wells in the vicinity of SGS/HCGS are not directly affected by plant operations, water samples were collected monthly from one farm's well (3E1) during January through December of the year. This well is located upgradient of the stations aquifer. Each management audit sample was analyzed for gross alpha, gross beta, tritium, and gamma emitters.

- Gross alpha activity was detected in one of the well water samples at a concentration of 1 pCi/L. LLD's ranged from <0.5 to 1.2 pCi/L. The maximum preoperational level detected was 9.6 pCi/L. There was no preoperational average determined for this analysis.

- Gross beta activity was detected in all 12 well water samples. Concentrations for the samples ranged from 8.4 to 12 pCi/L, with an average of 10 pCi/L. The 2008 gross beta results are comparable with the preoperational results which ranged from <2.1 to 38 pCi/L, with an average value of 9 pCi/L.

- Tritium activity was not detected above the minimum detectable concentration in any of the well water samples. The MDC ranged from <134 to <155 pCi/L. The maximum preoperational level detected was 380 pCi/L. There was no preoperational average determined for this analysis.

- Gamma spectroscopy performed on each of the 12 well water samples indicated the presence of the naturally-occurring radionuclides K-40 and RA-NAT. All other gamma emitters searched for in the nuclide library used by nuclear plants were below the minimum detectable concentration.

    - RA-NAT was detected in all 12 of the well water samples at concentrations ranging from 66 to 254 pCi/L with an average of 138 pCi/L. The maximum preoperational level detected was 2.0 pCi/L. There was no preoperational average determined for this analysis.

    These values are similar to those found in the past 19 years. However, as with the 1989 through 2007 results, they are higher than those found in the preoperational program. These results are due to a procedural change instituted in 1989 for water sample preparation.

This change results in less removal of radon (and its daughter products) from the sample, which causes the higher numbers we are recording. It is reasonable to conclude that values currently observed are typical for this region. [28]

- Potassium-40 was detected in 2 of the samples at concentrations of 48 and 61 pCi/L. The maximum preoperational level detected was 30 pCi/L. There was no preoperational average determined for this analysis.

Potable Water (Drinking Water) (Tables C-8, C-9)

Both raw and treated potable water samples were collected and composited by The City of Salem Water and Sewer Department personnel. Each sample consisted of daily aliquots composited into a monthly sample. The raw water source for this plant is Laurel Lake and its adjacent wells. These are management audit samples as no liquid effluents discharged from SGS/HCGS will directly affect this pathway. Each of the 24 individual samples was analyzed for gross alpha, gross beta, tritium, iodine-131 and gamma emitters.

- Gross alpha activity was detected in 3 raw water samples at concentrations of 0.4 to 0.6 pCi/L. It was not detected in any of the treated water samples. Minimum detectable concentrations for the remaining 21 samples (both treated and raw) ranged from <0.4 to <0.6 pCi/L. The maximum preoperational level detected was 2.7 pCi/L. There was no preoperational average determined for this analysis.

- Gross beta activity was detected in all 24 of the raw and treated water samples. The raw samples were at concentrations ranging from 2 to 3.2 pCi/L. Concentrations for the treated water ranged from 1.9 to 3.5 pCi/L. The average concentration for both raw and treated was 2.7 pCi/L. The maximum preoperational level detected was 9.0 pCi/L, with an average of 4.2 pCi/L.

- Tritium activity was not detected above minimum detectable concentration in any of the raw or treated potable water samples. MDC's for the raw and treated samples ranged from <139 to <155 pCi/L. The maximum preoperational level detected was 350 pCi/L, with an average of 179 pCi/L.

- Iodine-131 measurements were performed to an LLD of 1.0 pCi/L, even though the drinking water supplies are not affected by discharges from the Site. Additionally, the receiving water body (Delaware River) is brackish and therefore the water is not used for human consumption.

  Iodine-131 measurements for all 24 samples were below the minimum detectable concentration. These values ranged from <0.1 to <0.3 pCi/L. There was no preoperational data available for comparison.

- Gamma spectroscopy performed on each of the 24 monthly water samples indicated the presence of the naturally-occurring radionuclides K-40 and RA-NAT. All other gamma emitters searched for in the nuclide library used by nuclear plants were below the minimum detectable concentration.

  - The radionuclide K-40 was detected in 6 of the treated potable waters at concentrations ranging from 28 to 57 pCi/L. It was detected in 9 of the raw potable water samples at concentrations from 8.0 to 57 pCi/L. The average for both raw and treated results was 33 pCi/L. LLD's for the remaining 9 potable water samples were <10 to <16 pCi/L. There was no preoperational data available for comparison.

  - RA-NAT was detected in 4 of the treated potable waters at concentrations ranging from 3.0 to 24 pCi/L. It was detected in 1 of the raw potable water samples at a concentration of 9.0 pCi/L. LLD's for the remaining 19 samples were <1.5 to <4.2 pCi/L. The maximum preoperational level detected was 1.4 pCi/L.

There was no preoperational average determined for this analysis. The higher results in the three measurable samples are due to the procedural change for sample preparation, as discussed in the Well Water section.

Vegetables (Table C-10)

Although vegetables in the region are not irrigated with water into which liquid plant effluents have been discharged, a variety of food products grown in the area for human consumption were sampled at 5 indicator stations (14 samples) and 5 control stations (13 samples). These vegetables, collected as management audit samples, were analyzed for gamma emitters and included asparagus, cabbage, sweet corn, peppers, and tomatoes.

- Gamma spectroscopy performed on each of the 27 samples indicated the presence of the naturally-occurring radionuclide K-40. All other gamma emitters searched for in the nuclide library used by nuclear plants were below the minimum detectable concentration.

  - Potassium-40 was detected in all 27 samples. Concentrations for the 14 indicator station samples ranged from 1370 to 2620 pCi/kg-wet and averaged 1950 pCi/kg-wet. Concentrations for the 13 control station samples ranged from 1380 to 2240 pCi/kg-wet, and averaged 1920 pCi/kg-wet. The average concentration detected for all samples, both indicator and control, was 1940 pCi/kg-wet. The maximum preoperational level detected was 4800 pCi/kg-wet, with an average of 2140 pCi/kg-wet.

Fodder Crops (Table C-11)

Although not required by the SGS or HCGS Technical Specifications and ODCM, 6 samples of crops normally used as cattle feed (silage and soybeans) were collected from four indicator stations (4 samples) and one control station (2 samples). It was determined that these products may be a significant 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 this year are milk sampling stations.

In addition to the silage and soybean, ornamental cabbage was planted and maintained by MTS personnel at 3 locations on site and 1 in Delaware, at 3.9 miles. These samples were harvested in December. These broad leaf vegetation samples were deemed necessary since there are no longer any milk farms operating within the 5 km radius of SGS/HCGS. The closest milk farm we have is located in Odessa, DE at 4.9 miles (7.88 km).

- Gamma spectroscopy performed on each of the 10 samples indicated the presence of the naturally-occurring radionuclides Be-7, K-40 plus RA-NAT in one sample. All other gamma emitters searched for in the nuclide library used by nuclear plants were below the minimum detectable concentration.

  - Beryllium-7, attributed to cosmic ray activity in the atmosphere, was detected in 3 of the indicator silage samples at concentrations from 142 to 255 pCi/kg-wet. It was detected in the control station silage sample at 137 pCi/kg-wet. The maximum preoperational level detected for silage was 4700 pCi/kg-wet, with an average of 2000 pCi/kg-wet. Be-7 was not detected in either the indicator nor control station soybean samples. The maximum preoperational level detected for soybean samples was 9300 pCi/kg-dry. Be-7 was detected in 1 of the ornamental cabbage samples at a concentration of 167 pCi/kg-wet. There was no preoperational data available for comparison with this type of samples.

  - Potassium-40 was detected in all 10 of the vegetation station samples. The combined average for the indicator station samples was 4430 pCi/kg-wet. The average for the 2 control station vegetation samples was 7570 pCi/kg-wet. The average concentration detected for the silage samples (both indicator and control) was 2770 pCi/kg-wet. Preoperational results averaged 7000 pci/kg-wet. Results for the soybean samples (indicator and control) was 14700 pCi/kg-wet.

Preoperational soybean results averaged 22000 pCi/kg-dry. The average concentration of K-40 for the 4 ornamental cabbage samples was 2740 pCi/kg-wet. There was no preoperational data available for comparison with these samples.

- RA-NAT was detected in 1 of the control soybean samples at a concentration of 11 pCi/kg-wet. MDC's for all the remaining vegetation samples, both indicator and control, ranged from <3.6 to <12 pCi/L. There was no preoperational average available for comparison.

AQUATIC

Environmental Consulting Services, Inc (ECSI) collected all aquatic samples (with the exception of the 6S2 shoreline sediment).

Surface water samples were collected in new polyethylene containers that were rinsed twice with the sample medium prior to collection.

Edible fish are taken by gill nets while crabs are caught in commercial traps. These samples are then processed where the flesh is separated from the bone and shell. The flesh is placed in sealed containers and frozen before being transported in ice chests to MTS for analysis.

Sediment samples collected by ECSI were taken with a bottom grab sampler and frozen in sealed polyethylene containers before being transported in ice chests to MTS. Personnel from MTS collect location 6S2 shoreline sediment on the beach behind the parking area for the Helicopter Pad. A square area, measuring 1 meter on each side is staked out and then divided into a grid of 9 smaller boxes, 3 per side. A 1 inch deep scoop from the center of each of the small grids is taken. All the aliquots are combined and the total sample transported in the ice chest to MTS.

Surface Water (Tables C-12, C-13, C-14)

Surface water samples were collected monthly at 4 indicator stations and one control station in the Delaware estuary. One location (11A1) is at the outfall area (which is the area where liquid radioactive effluents from the Salem Station are allowed to be discharged into the Delaware River), another is downstream from the outfall area (7E1), and another is directly west of the outfall area at the mouth of the Appoquinimink River (12C1). Two upstream locations are in the Delaware River (1F2) and 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, directly west, at the mouth of the Appoquinimink River, serves as the operational control. Location 12C1 was chosen 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 pre-operational summary report, due to the tidal nature of this Delaware-River-Bay estuary, there are flow rate variations. The further the distance from the boundary between the Delaware River and the Delaware Bay (Liston Point), the lower the background levels, the lower the salinity, lower K-40(as determined by Atomic Absorption) and lower concentrations of soluble gross beta emitters. All surface water samples were analyzed monthly for gross beta, tritium and gamma emitters.

- Gross beta activity was detected in all 48 of the indicator station samples ranging from 8.4 to 330 pCi/L, with an average of 97 pCi/L. Beta activity was detected in all 12 of the control station samples with concentrations ranging from 24 to 158 pCi/L, with an average of 73 pCi/L. The maximum preoperational level detected was 110 pCi/L, with an average of 32 pCi/L. Quarterly results for all locations are plotted on Figure 4, for the years 1988 to 2008, with an inset graph depicting the current year back to 1973.

- Tritium activity was detected in 1 of the control station samples at a concentration of 210 pCi/L. It was detected in 2 of the indicator station samples at concentrations of 140 and 150 pCi/L.

These levels were slightly above the minimum detectable concentration range. Minimum detectable concentrations for the remaining station samples, both indicator and control, ranged from <130 to <150 pCi/L. The maximum preoperational level detected was 600 pCi/L, with an average of 210 pCi/L. Positive results from 1988 to 2008 are plotted on Figure 5, with an inset graph depicting the current year back to 1973.

- Gamma spectroscopy performed on each of the 48 indicator station and 12 control station surface water samples indicated the presence of the naturally-occurring radionuclides K-40 and RA-NAT. All other gamma emitters searched for in the nuclide library used by nuclear plants were below the minimum detectable concentration.

  - Potassium-40 was detected in all 48 samples of the indicator stations at concentrations ranging from 51 to 186 pCi/L and in all 12 of the control station samples ranging from 49 to 115 pCi/L. The average for the indicator station locations was 97 pCi/L, while the average for the control station locations was 80 pCi/L. The maximum preoperational level detected was 200 pCi/L, with an average of 48 pCi/L.

  - RA-NAT was detected in 1 of the indicator stations at a concentration of 6.4 pCi/L. It was detected in only 1 of the control location samples at 6.1 pCi/L. MDC's for the remaining station samples, both indicator and control, ranged from <1.5 to <6.6 pCi/L. The maximum preoperational level detected was 4 pCi/L with no average determined.

Fish (Table C-15)

Edible species of fish were collected semi-annually at 3 locations, 2 indicator (7E1, 11A1) and 1 control (12C1), and analyzed for gamma emitters in flesh.

Samples included channel catfish, white catfish, bluefish, white perch, flounder and striped bass. (See explanation of controls in the surface water section). The 4 indicator and 2 control station samples from both semi-annual collections, indicated the presence of the naturally-occurring radionuclide K-40. All other gamma emitters searched for in the nuclide library used by nuclear plants were below the minimum detectable concentration.

- Potassium-40 was detected in all 4 samples from the indicator stations at concentrations ranging from 3320 to 3730 pCi/kg-wet for an average of 3590 pCi/kg-wet. K-40 was detected in both samples from the control location at 3540 and 3770 pCi/kg-wet. The average for the control samples was 3660 pCi/kg-wet. The maximum preoperational level detected was 13000 pCi/kg-wet, with an average of 2900 pCi/kg-wet.

Blue Crab (Table C-16)

Blue crab samples were collected twice during the season at 2 locations, 1 indicator and 1 control, and the edible portions were analyzed for gamma emitters. (See explanation of controls in the surface water section).

- Gamma spectroscopy performed on the flesh of the indicator station samples and the control station samples indicated the presence of the naturally-occurring radionuclides K-40 and RA-NAT. All other gamma emitters searched for in the nuclide library used by nuclear plants were below the minimum detectable concentration.

  - Potassium-40 was detected in both indicator station samples at concentrations of 2460 and 2600 pCi/kg-wet. It was detected in both control station samples at 2530 and 2690 pCi/kg-wet. The average for both the indicator and control station samples was 2570 pCi/kg-wet. The maximum preoperational level detected was 12000 pCi/kg-wet, with an average of 2835 pCi/kg-wet.

- RA-NAT was detected in 1 of the indicator stations at a concentration of 16 pCi/kg-wet. It was detected in only 1 of the control location samples at 24 pCi/kg-wet. Minimum detectable concentrations for the remaining station samples, both indicator and control, ranged from <7.8 to <8.0 pCi/kg-wet. The maximum preoperational level detected was 33 pCi/kg-wet with no average determined.

Sediment (Table C-17)

Sediment samples were collected semi-annually from 7 locations, including 6 indicator stations and 1 control station. (Location 6S2 is the only shoreline sediment and it is directly affected by tidal fluctuations) Each of the 14 samples was analyzed for gamma emitters. Only the naturally-occurring radionuclides K-40, Be-7, Th-232 and RA-NAT were detected in this years sediment samples. (See explanation of controls in the surface water section)

- Gamma spectroscopy was performed on each of the 12 indicator station samples and 2 control station samples. Except for the radionuclides listed above, all other gamma emitters searched for in the nuclide library used by nuclear plants were below the minimum detectable concentration.

- Cesium-137 was not detected in any of the indicator nor the control station samples this year. Minimum detectable concentrations for the 14 samples, both indicator and control, ranged from <3.8 to <27 pCi/kg-dry. Positive results from 1988 to 2008 are plotted on Figure 6, with an inset graph depicting the current year back to 1977.

- Cobalt-60 was not detected in any of the sediment samples. Minimum detectable concentrations for the 14 samples, indicator and control, ranged from <2.9 to <29 pCi/kg-dry. Results of all the positive values from 1988 to 2008 are plotted on Figure 6, with an inset graph depicting the current year back to 1977.

- Beryllium-7 was detected in 3 of the indicator station samples at concentrations of 157 to 308 pCi/kg-dry and an average of 233 pCi/kg-dry. It was not detected in either control location above minimum detectable concentration. The maximum preoperational level detected was 2300 pCi/kg-dry. There was no preoperational average determined for this nuclide.

- Potassium-40 was detected in all 12 indicator station samples at concentrations ranging from 1830 to 12400 pCi/kg-dry, with an average of 5946 pCi/kg-dry. Concentrations detected in both of the control station samples were at 7230 and 11700 pCi/kg-dry. The average for the control station samples was 9465 pCi/kg-dry. The maximum preoperational level detected was 21000 pCi/kg-dry, with an average of 15000 pCi/kg-dry.

- RA-NAT was detected in all 12 indicator station samples at concentrations ranging from 121 to 813 pCi/kg-dry, with an average of 420 pCi/kg-dry. Concentrations detected in both of the control station samples were at 246 and 667 pCi/kg-dry, with an average of 460 pCi/kg-dry. The grand average for both the indicator and control station samples was 430 pCi/kg-dry. The maximum pre-operational level detected was 1200 pCi/kg-dry, with an average of 760 pCi/kg-dry.

- Thorium-232 was detected in all 12 indicator station samples at concentrations ranging from 277 to 958 pCi/kg-dry, with an average of 546 pCi/kg-dry. Concentrations detected in both of the control station samples were at 443 and 8970 pCi/kg-dry, with an average of 4707 pCi/kg-dry. The grand average for both the indicator and control station samples was 1140 pCi/kg-dry. The maximum pre-operational level detected was 1300 pCi/kg-dry, with an average of 840 pCi/kg-dry.

PROGRAM DEVIATIONS

Location 2F6 (7.3 miles NNE of vent) experienced an equipment malfunction the week of January 8 through 14, 2008. The quick disconnect fitting failed causing the APT/AIO assembly to separate from the air sampler. Both the APT and AIO samples were invalid for this week due to low sample volume. Although this had not happened before, MTS decided to replace all the brass fittings with new stainless steel ones at all the air sampler locations.

Due to power losses the 5S1 air sampler station had air particulate and iodine samples with insufficient volumes on the following dates:

STATION	LOCATION	HOURS UNAVAILABLE	DATES
5S1	1.0 mi. E of vent	124.4	3/3-10/08
5S1	1.0 mi. E of vent	121.2	12/8-15/08
5S1	1.0 mi. E of vent	107.2	12/22-29/08

Both air particulate and air iodine samples were considered invalid due to an unplanned power outage on three separate occasions. The loss of these three air samples resulted in 96% availability on this sample station. This is greater than the 90% availability goal for sampler availability. This sampler is located along the site access road and its power line is subjected to high winds and icing, causing the frequent power losses during inclement weather. Corrective actions are being taken. Site services will be relocating this sampler across the road. The new power supply is the underground feed for the PSEG Security Check Point. This feed has a back-up diesel generator, which will supply emergency power in the unlikely event of a loss of power.

On July 1st, 2008 Location 14F4 milk farm experienced an electrical fire which destroyed its milk barn and hay loft. The farmer relocated his 100+ milk animals to other farms in the area until he could rebuild. In the interim, he gave us the name and location of the closest milk farm to him, Location 14G3 (13.7 miles WNW of the vent). We then collected milk from this location for the remainder of the year. No milk samples were missed during 2008.

HOPE CREEK TECHNICAL SPECIFICATION LIMIT FOR PRIMARY WATER IODINE CONCENTRATIONS

The Hope Creek primary water chemistry results for 2008 were reviewed. The specific activity of the primary coolant did not exceed 0.2 microcuries per gram Dose Equivalent I-131. Therefore, the iodine concentrations in the primary coolant did not exceed the Tech Spec limit specified in section 3.4.5.

CONCLUSIONS

The Radiological Environmental Monitoring Program for Salem and Hope Creek Generating Stations was conducted during 2008 in accordance with the SGS and HCGS Technical Specifications and ODCM. The LLD values required by the Technical Specifications and ODCM were achieved for this reporting period (See Appendix A and Appendix C). The objectives of the program were also met during this period. The data collected assists in demonstrating that SGS and HCGS were operated in compliance with Technical Specifications and ODCM requirements.

From the results obtained, it can be concluded that the levels and fluctuations of radioactivity in environmental samples were as expected for an estuarine environment. The concentration of radioactive material in the environment that could be attributable to Salem and Hope Creeks stations operations was only a small fraction of the concentration of naturally occurring and man-made radioactivity. 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, we can conclude that the operation of the Salem and Hope Creek Stations had no significant radiological impact on the environment.

TABLE 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
1. <u>DIRECT RADIATION</u> Thermoluminescent Dosimeters	Forty-nine routine monitoring stations with two or more dosimeters placed as follows: An inner ring of stations, one in each land based meteorological sector (not bounded by water) in the general area of the site boundary: 1S1, 2S2, 2S4, 3S1, 4S1, 5S1, 6S2, 7S1, 10S1, 11S1, 15S1, 16S1. An outer ring of stations, one in each land-based meteorological sector in the 5 - 11 km range (3.12 - 6.88 miles) from the site (not bounded by or over water): 4D2, 5D1, 10D1, 14D1, 15D1, 2E1, 3E1, 11E2, 12E1, 13E1, 16E1, 1F1, 3F2, 4F2, 5F1, 6F1, 9F1, 10F2, 11F1, 13F2, 14F2, 15F3. The balance of the stations to be placed in special interest areas such as population centers, nearby residences, and schools: 2F2, 2F5, 2F6, 3F3, 7F2, 12F1, 13F3, 13F4, 16F2, 1G3, 10G1, 16G1, 3H1. and in two areas to serve as control stations: 3G1, 14G1.	Quarterly	Gamma dose/ quarterly

TABLE 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
2. <u>ATMOSPHERIC</u>	Samples from 6 locations:		
a. Air Particulate	1 sample from close to the Site Boundary : 5S1 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	1 Sample from the vicinity of a community: 16E1. 1 Sample from a control location, as for example 15-30 km distant and in the least prevalent wind direction: 14G1.		Iodine-131 / weekly
3. <u>TERRESTRIAL</u>			
a. Milk	Samples from milking animals in 3 locations within 5 km distance. If there are none, then, 1 sample from milking animals in each of 3 areas between 5 - 8 km (3.12 - 5 miles) distant: 13E3, 14F4, 2G3. [1]	Semi-monthly (when animals are on pasture)	Gamma scan / semi-monthly Iodine-131 / semi-monthly
	1 Sample from milking animals at a control location 15 - 30 km distant (9.38 - 18.75 miles): 3G1.	Monthly (when animals are not on pasture)	Gamma scan / monthly Iodine-131 / monthly
b. Well Water (Ground)	Samples from one or two sources only if likely to be affected. (Although wells in the vicinity of SGS/HCGS are not directly affected by plant operations, we sample 3E1 farm's well, as <u>management audit</u>)	Monthly	Gamma Scan / monthly Gross alpha / monthly Gross beta / monthly Tritium / monthly

TABLE 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. Potable Water (Drinking Water)	One sample of the nearest water supply affected by its discharge (No potable water samples are required as liquid effluents discharged from SGS/HCGS do not directly affect this pathway) However, for management audit, one raw and one treated sample from a public water supply (City of Salem Water and Sewer Department) is collected: 2F3	Monthly (composited daily)	Gross alpha / monthly Gross beta / monthly Tritium / monthly Gamma scan / monthly Iodine-131 / monthly
d. Vegetables	One sample of each principal class of food products from area that is irrigated by water in which liquid plant wastes have been discharged (The Delaware River at the location of SGS/HCGS is a brackish water source and is not used for irrigation of food products). Management audit samples are collected from various locations during harvest: 2F9, 3F7, 2G2, 9G1, 3H5, 2F10, 3F6, 9G2, 15F4, 2G4.	Annually (at harvest)	Gamma scan/on collection
e. Fodder Crops	Broad leaf vegetation (ornamental cabbage) was planted & collected in lieu of having a milk farm within 5 km of the Site [1]: 10D1, 1S1, 15S1, 16S1. Although not required by SGS/HCGS ODCM, samples of crops normally used as cattle feed (silage-soybeans) were collected as management audit samples: 14F4, 3G1, 2G3, 13E3, 14G3.	Annually (at harvest)	Gamma scan/on collection

TABLE 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
f. Soil	Although not required by SGS/HCGS ODCM, samples of soil are collected as <u>management audit samples</u>: 6S2, 2F9, 5F1, 10D1, 16E1, 13E3, 14F4, 2G3, 3G1 (Not sampled during 2008)	Every 3 years (2007-2010-2013)	Gamma scan/on collection
4. <u>AQUATIC ENVIRONMENT</u> a. Surface Water	One sample upstream: 1F2 One sample downstream: 7E1 One sample outfall: 11A1 One sample cross-stream (mouth of Appoquinimink River): 12C1 (2) And an additional location in the Chesapeake & Delaware Canal: 16F1	Monthly	Gross Beta/monthly Gamma scan/monthly Tritium/monthly**
b. Edible Fish	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 (2) And an additional location downstream: 7E1	Semi-annually	Gamma scan (flesh)/ on collection
c. Blue Crabs	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 (2)	Semi-annually	Gamma scan (flesh)/ on collection

TABLE 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
d. Sediment	One sample from downstream area: 7E1 One sample from cross-stream area/One sample from a control location: 12C1(2) One sample from outfall area: 11A1 One sample from the C&D Canal: 16F1 One sample from shoreline area: 6S2 One sample from Cooling Tower Blowdown: 15A1 And an additional location of south storm drain discharge line: 16A1	Semi-annually	Gamma scan/on collection

* Except for TLDs, the quarterly analysis is performed on a composite of individual samples collected during the quarter.

** Tech Specs and ODCM require quarterly analysis but due to the tritium leak at Salem, it was decided to analyze surface waters on a monthly basis for tritium.

(1) 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, MTS personnel planted and harvested ornamental cabbage (Brassica oleracea) at three locations on Site (1S1, 15S1, 16S1) and one across the river in Delaware (10D1).

(2) 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.

FIGURE 1
GROSS BETA ACTIVITY IN AIR PARTICULATE
1988 THROUGH 2008

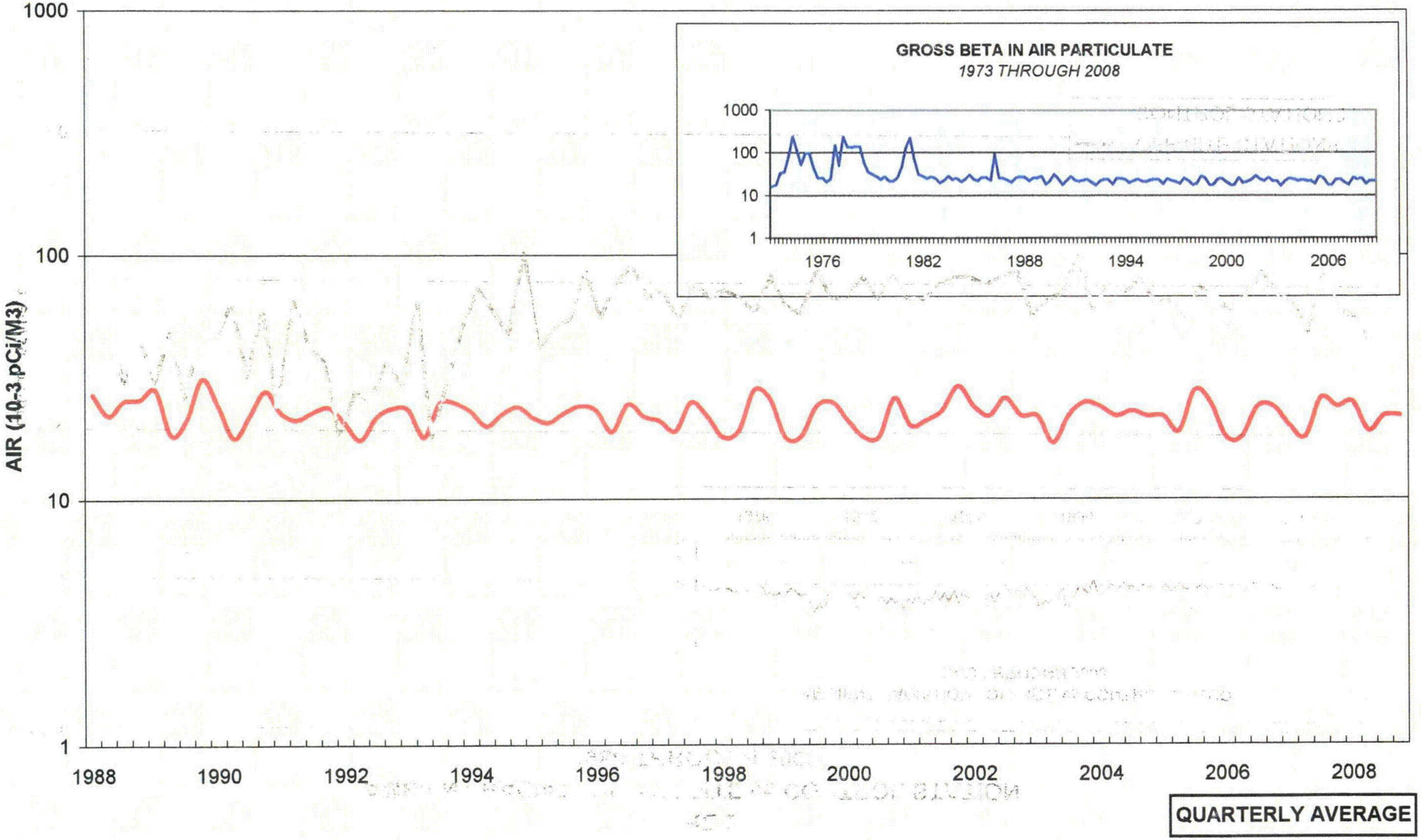

FIGURE 2
AMBIENT RADIATION - OFFSITE vs CONTROL STATION
1988 THROUGH 2008

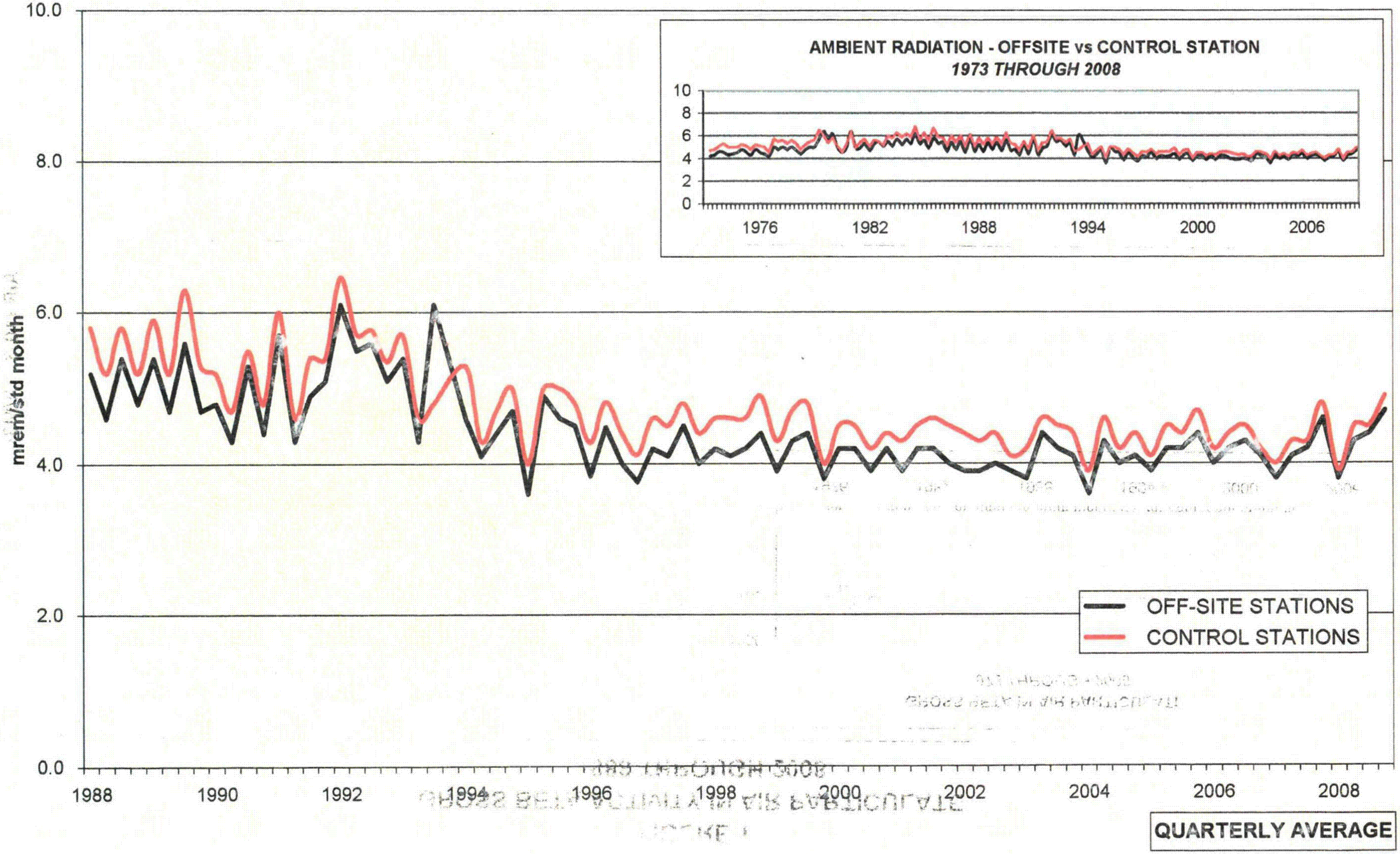

FIGURE 3
IODINE-131 ACTIVITY IN MILK
1988 THROUGH 2008

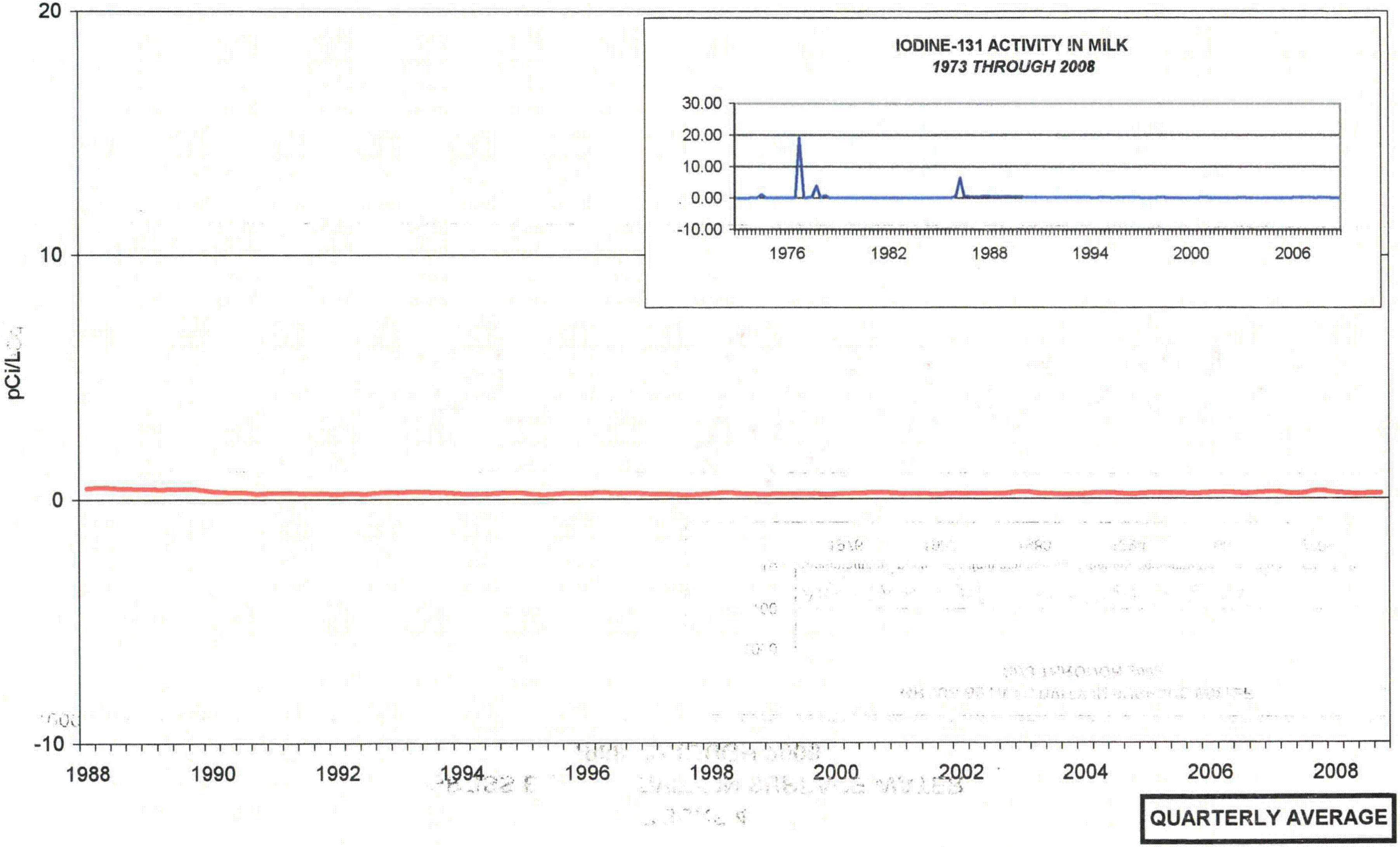

FIGURE 4
GROSS BETA ACTIVITY IN SURFACE WATER
1988 THROUGH 2008

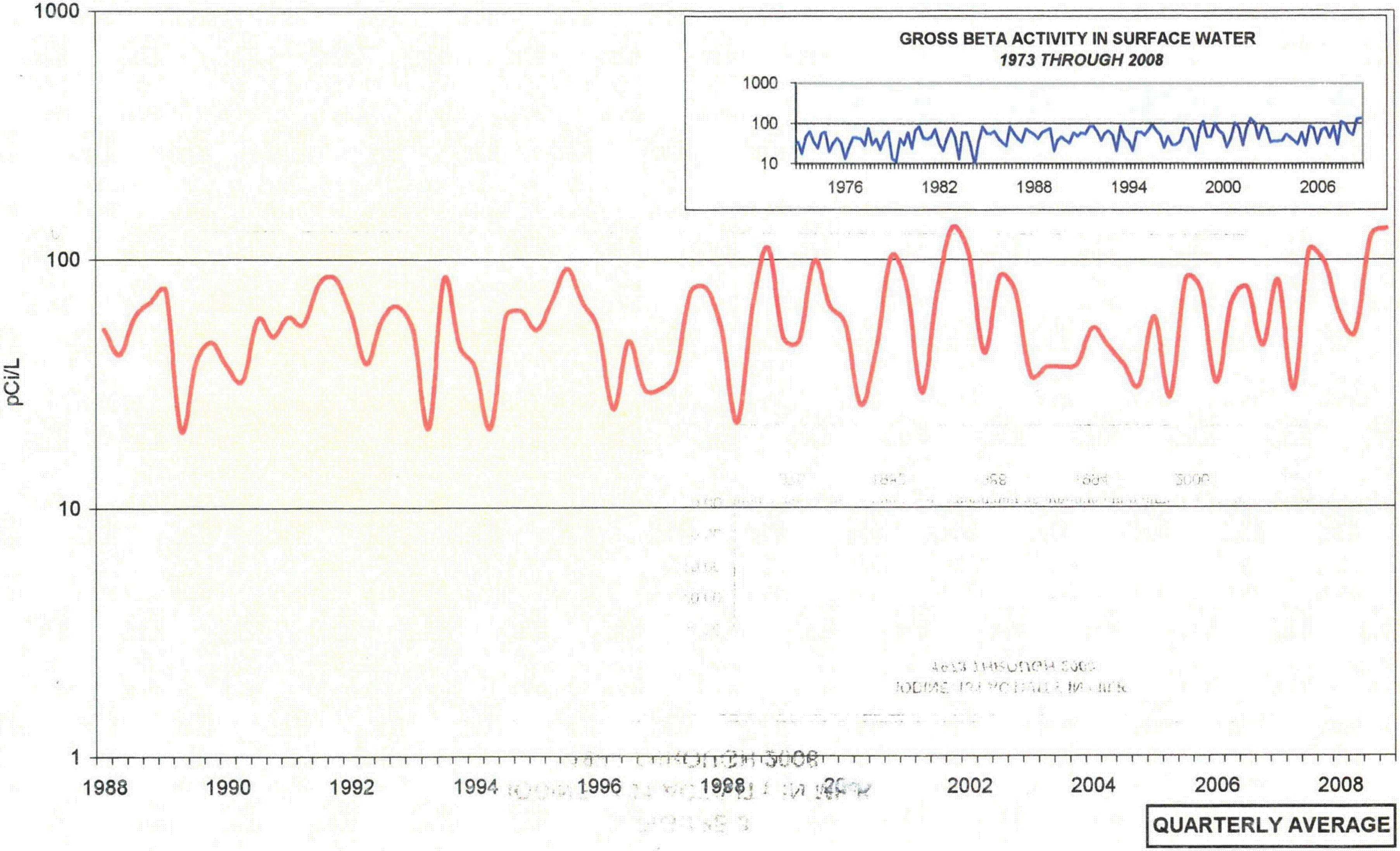

FIGURE 5
TRITIUM ACTIVITY IN SURFACE WATER
1988 THROUGH 2008

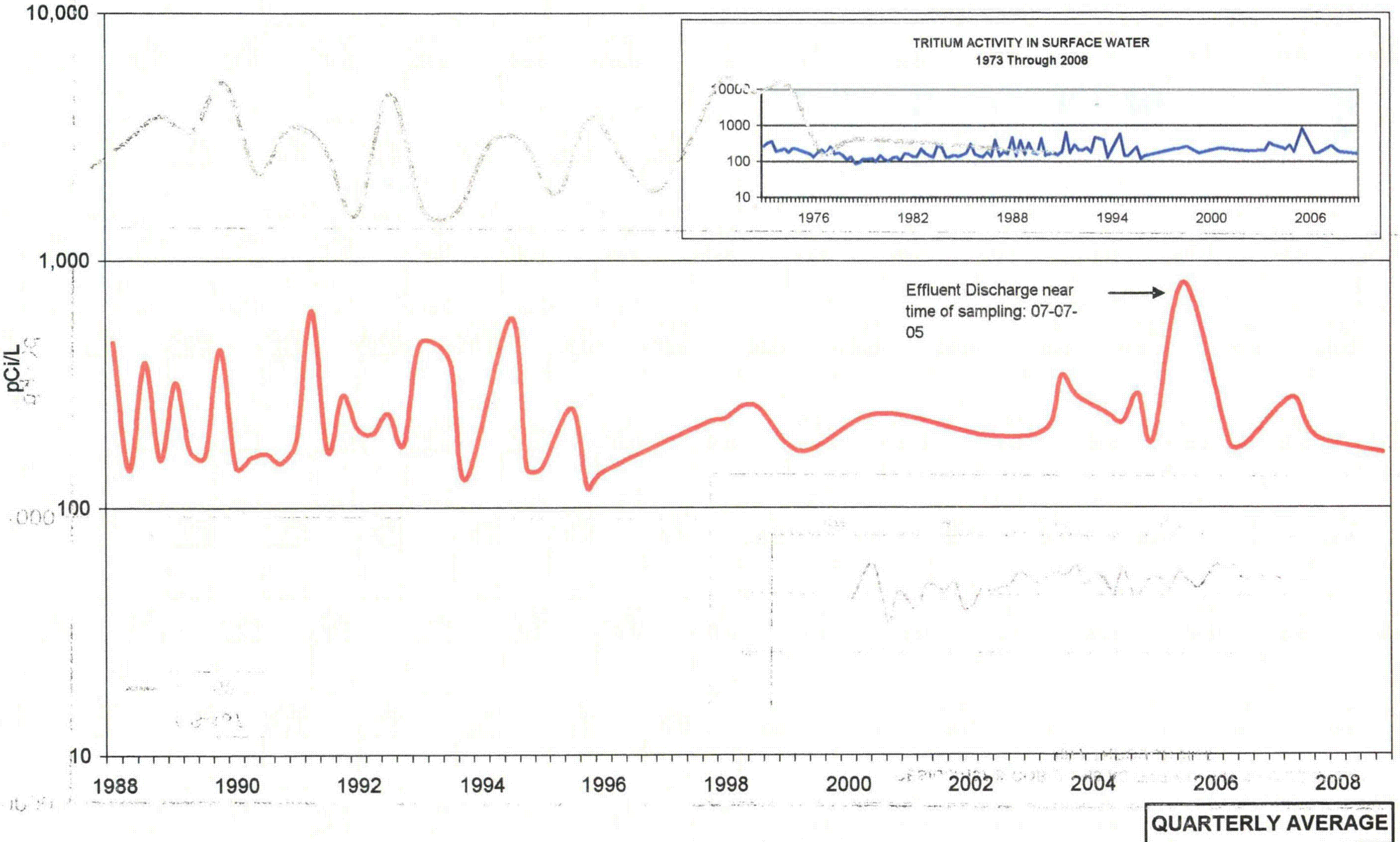

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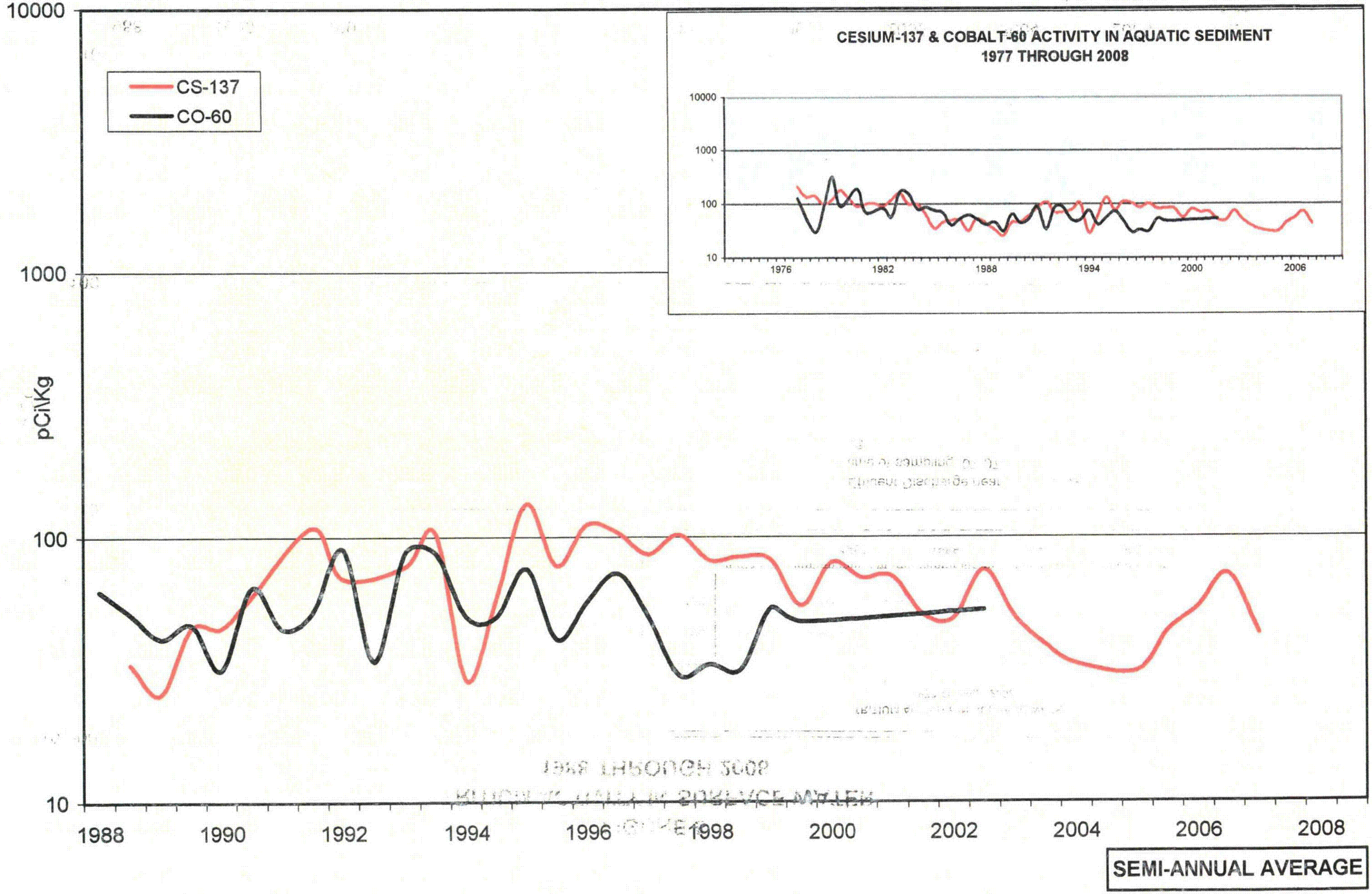
FIGURE 6

CESIUM-137 & COBALT-60 ACTIVITY IN AQUATIC SEDIMENT

1988 THROUGH 2008



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APPENDIX A

PROGRAM SUMMARY

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

SALEM COUNTY, NEW JERSEY JANUARY 1, 2008 to DECEMBER 31, 2008

MEDIUM OR PATHWAY SAMPLE (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	Location with Highest Mean Mean (Range)	Control Location Mean (Range)	Number of Nonroutine Reported Measurements
I. AIRBORNE								
Air Particulates (10^{-3} pCi/m^3)	Beta	314	6.0	22 (261 /265) (7-57)	1F1 5.8 mi N	23 (53 /53) (8-54)	22 (53 /53) (9-51)	0
					2F6 7.3 mi NNE	23 (52 /53) (9-57)		
	Gamma Be7	24	2.0	81 (20 /20) (63-102)	2F6 7.3 mi NNE	86 (4 /4) (65-101)	80 (4 /4) (62-95)	0
	K-40	24	9.0	11 (20 /20) (8-17)	2F6 7.3 mi NNE	13 (4 /4) (8-10)	10 (4 /4) (8-11)	0
	RANAT	24	1.1	1 (3 /20) (0.8-1.1)	2F6 7.3 mi NNE	1.1 (1 /4) (1-1.1)	<LLD	
Air Iodine (10^{-3} pCi/m^3)	I-131	314	8.5	<LLD	-	<LLD	<LLD	0
II DIRECT								
Direct Radiation (mrad/std. month)	Quarterly Badges	196	-	4.3 (172 /172) (2.6-6.3)	1F1 5.8 mi N	5.8 (4 /4) (5.1-6.3)	4.5 (24 /24) (3.3-5.8)	0
III TERRESTRIAL								
Milk (pCi/L)	I-131	80	0.3	<LLD	-	<LLD	<LLD	0
	Gamma K-40	80	32	1340 (60 /60) (1120-1470)	13E3 4.9 mi W	1360 (20 /20) (1270-1450)	1290 (20 /20) (1200-1390)	0
	RA-NAT	80	5.1	11 (1 /60) (11-11)	2G3 12 mi NNE	11 (1 /20) (11-11)	<LLD	0

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

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

SALEM COUNTY, NEW JERSEY JANUARY 1, 2008 to DECEMBER 31, 2008

MEDIUM OR PATHWAY SAMPLE (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	Location with Highest Mean Mean (Range)	Control Location Mean (Range)	Number of Nonroutine Reported Measurements
III TERRESTRIAL								
Well Water (pCi/L)	Alpha	12	1.2	1 (1 /12) (1-1)	3E1 4.1 mi NE	1 (1 /12) (1-1)	No Control Location	0
	Beta	12	1.0***	10 (12 /12) (8.4-12)	3E1 4.1 mi NE	10 (12 /12) (8.4-12)	No Control Location	0
	H-3	12	155	<LLD	-	<LLD	No Control Location	0
	Gamma							
	K-40	12	34	55 (2 /12) (48-61)	3E1 4.1mi NE	55 (2 /12) (48-61)	No Control Location	0
	RA-NAT	12	6.6	138 (12 /12) (66-254)	3E1 4.1mi NE	138 (12 /12) (66-254)	No Control Location	0
Potable Water (pCi/L)	Alpha	24	0.6	0.5 (3 /24) (0.4-0.6)	2F3 8.0 mi NNE	0.5 (3 /24) (0.4-0.6)	No Control Location	0
	Beta	24	1.0***	2.7 (24 /24) (1.9-3.6)	2F3 8.0 mi NNE	2.7 (24 /24) (1.9-3.6)	No Control Location	0
	H-3	24	155	<LLD	-	<LLD	No Control Location	0
	Gamma							
	K-40	24	34	44 (15 /24) (8-57)	2F3 8.0 mi NNE	44 (15 /24) (8-57)	No Control Location	0
	I-131	24	0.3	<LLD	-	<LLD	No Control Location	0
	RA-NAT	24	6.6	12 (5 /24) (3-24)	2F3 8.0 mi NNE	12 (5 /24) (3-24)	No Control Location	0
Fruit & Vegetables (pCi/Kg-wet)	Gamma							
	K-40	27	70	1950 (14 /14) (1370-2620)	15F4 7.0 mi NW	2150 (2 /2) (2020-2270)	1920 (13 /13) (1380-2240)	0
					3F6 6.5 mi NE	2150 (2 /2) (2090-2210)		

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

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

SALEM COUNTY, NEW JERSEY — JANUARY 1, 2008 to DECEMBER 31, 2008

MEDIUM OR PATHWAY SAMPLE (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	Location with Highest Mean Mean (Range)	Control Location Mean (Range)	Number of Nonroutine Reported Measurements
III TERRESTRIAL								
Fodder Crops (pCi/Kg-wet)	Gamma							
	Be-7	10	75	199 (4 /8) (137-255)	2G3 12 mi NNE	255 (1 /1) (255)	137 (1 /2) (137-137)	0
	K-40	10	32	4430 (8 /8) (1970-16200)	14F4 7.6 mi WNW	16200 (1 /1) (16200-16200)	7570 (2 /2) (2030-13100)	0
	RA-NAT	10	12	11 (1 /8) (11-11)	3G1 17 mi NE	11 (1 /2) (11-11)	11 (11-11)	0
IV AQUATIC								
Surface Water (pCi/L)	Beta	60	9.7	97 (48 /48) (8.4-330)	7E1 4.5 mi SE	161 (12 /12) (78-330)	73 (12 /12) (24-158)	0
	H-3	60	150	150 (2 /48) (140-150)	12C1 2.5 mi. WSW	210 (1 /12) (210-210)	210	0
	Gamma							
	K-40	60	34	97 (48 /48) (51-186)	7E1 4.5 mi SE	118 (12 /12) (89-160)	80 (12 /12) (49-115)	0
	RA-NAT	60	6.6	6.4 (1 /48) (6.4-6.4)	7E1 4.5 mi SE	6.4 (1 /12) (6.4-6.4)	6.1 (1 /12) (6.1-6.1)	0
Blue Crabs (pCi/kg-wet)	Gamma							
	K-40	4	55	2530 (2 /2) (2460-2600)	12G1 2.52 mi. WSW	2610 (2 /2) (2530-2690)	2610 (2 /2) (2530-2690)	0
	RA-NAT	4	24	16 (1 /2) (16-16)	12C1 2.52 mi. WSW	24 (1 /2) (24-24)	24 (1 /2) (24-24)	0
Edible Fish (pCi/kg-wet)	Gamma							
	K-40	6	55	3593 (4 /4) (3320-3730)	7E1 4.5 mi. SE	3665 (2 /2) (3600-3730)	3655 (2 /2) (3540-3770)	0
Sediment (pCi/kg-dry)	Gamma							
	Be-7	14	128	233 (3 /12) (157-308)	6S2 0.2 mi. ESE	308 (1 /2) (308-308)	<LLD	0

RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM

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

SALEM COUNTY, NEW JERSEY — JANUARY 1, 2008 to DECEMBER 31, 2008

MEDIUM OR PATHWAY SAMPLE (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	Location with Highest Mean Mean (Range)	Control Location Mean (Range)	Number of Nonroutine Reported Measurements
IV AQUATIC Sediment (pCi/kg-dry)	K-40	14	55	5946 (12 /12) (1830-12400)	7E1 4.5 mi. SE	12100 (2 /2) (15500-17300)	9565 (2 /2) (7230-11900)	0
	Co-60	14	29	<LLD	-		<LLD	0
	Cs-137	14	27	<LLD	-		<LLD	0
	RA-NAT	14	5.0	420 (12 /12) (121-813)	16A1 0.7 mi. NNW	690 (2 /2) (574-813)	460 (2 /2) (246-670)	0
	Th-232	14	8.1	546 (12 /12) (277-958)	7E1 4.5 mi. SE	849 (2 /2) (338-859)	670 (2 /2) (443-897)	0

* LLD listed is the lower limit of detection which we endeavored to achieve during this reporting period. In some instances nuclides were detected at concentrations above/below the LLD values shown.
** Mean calculated using values above LLD only. Fraction of measurements above LLD are in parentheses.
*** Typical LLD values.

APPENDIX B

SAMPLE DESIGNATION
AND
LOCATIONS

APPENDIX B

SAMPLE DESIGNATION

The PSEG's Maplewood Testing Services identifies samples by a three part code. The first two letters are the program identification code. Because of the proximity of the Salem and Hope Creek Stations a common environmental surveillance program is being conducted. The identification code, "SA", has been applied to Salem and Hope Creek stations. The next three letters are for the media sampled.

AIO =	Air Iodine	IDM =	Immersion Dose (TLD)
APT =	Air Particulate	MLK =	Milk
ECH =	Hard Shell Blue Crab	PWR =	Potable Water (Raw)
ESF =	Edible Fish	PWT =	Potable Water (Treated)
ESS =	Sediment	SOL =	Soil
FPL =	Green Leaf Vegetables	SWA =	Surface Water
FPV =	Vegetables (Various)	VGT =	Fodder Crops (Various)
GAM=	Game (Muskrat)	WWA=	Well Water

The last four symbols are a location code based on direction and distance from a standard reference point. The reference point is located at the midpoint between the center of the Salem 1 and Salem 2 containments. Of these, the first two represent each of the sixteen angular sectors of 22.5 degrees 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:

1 = N	5 = E	9 = S	13 = W
2 = NNE	6 = ESE	10 = SSW	14 = WNW
3 = NE	7 = SE	11 = SW	15 = NW
4 = ENE	8 = SSE	12 = WSW	16 = NNW

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

S =	On-site location	E =	4-5 miles off-site
A =	0-1 miles off-site	F =	5-10 miles off-site
B =	1-2 miles off-site	G =	10-20 miles off-site
C =	2-3 miles off-site	H =	>20 miles off-site
D =	3-4 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 Salem and Hope Creek 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 Salem 1 and 2 containments at a radial distance of 4 to 5 miles off-site, (therefore, radial distance E). The number 1 indicates that this is sampling station #1 in that particular sector.

TABLE B-1
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. The Datum used was WGS 84.

STATION CODE	STATION LOCATION	LATITUDINAL DEG. MIN. SEC	LONGITUDINAL DEG. MIN. SEC	SAMPLE TYPE
1S1	0.55mi. N	39 - 28 - 16	75 - 32 - 13	IDM,VGT
2S2	0.4 mi. NNE; Lamp Pole 65 Near HC Switch Yard	39 - 28 - 07	75 - 32 - 00	IDM
2S4	0.59 mi. NNE	39 - 28 - 18	75 - 31 - 54	IDM
3S1	0.58 mi. NE	39 - 28 - 08	75 - 31 - 41	IDM
4S1	0.60 mi. ENE	39 - 28 - 02	75 - 31 - 33	IDM
5S1	1.0 mi. E; site access road	39 - 27 - 38	75 - 31 - 08	AIO,APT,IDM
6S2	0.23mi. ESE; area around Helicopter Pad	39 - 27 - 43	75 - 31 - 55	IDM,SOL,ESS
7S1	0.12 mi. SE; station personnel gate	39 - 27 - 44	75 - 32 - 03	IDM
10S1	0.14 mi. SSW; inlet cooling water bldg.	39 - 27 - 41	75 - 32 - 10	IDM
11S1	0.09 mi. SW; service water inlet bldg.	39 - 27 - 43	75 - 32 - 12	IDM
15S1	0.57 mi. NW	39 - 28 - 10	75 - 32 - 32	IDM,VGT
16S1	0.54 mi. NNW	39 - 28 - 13	75 - 32 - 26	IDM,VGT
11A1	0.2 mi. SW; outfall area	39 - 27 - 59	75 - 32 - 25	ECH,ESF,ESS,SWA
11A1A	0.15 mi. SE; Located at the plant barge slip	39 - 27 - 41	75 - 32 - 02	Alternate SWA
15A1	0.65 mi. NNW; cooling tower blowdown discharge line outfall	39 - 27 - 67	75 - 32 - 19	ESS
16A1	0.24 mi. NW; south storm drain discharge line	39 - 28 - 24	75 - 32 - 58	ESS
12C1	2.5 mi. WSW; west bank of Delaware River	39 - 27 - 22	75 - 34 - 08	ECH,ESF,ESS,SWA
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 - 18	75 - 32 - 11	IDM
5D1	3.5 mi. E; local farm	39 - 28 - 24	75 - 28 - 22	AIO,APT,IDM
10D1	3.9 mi. SSW; Taylor's Bridge Spur	39 - 24 - 37	75 - 33 - 44	IDM,SOL,VGT
14D1	3.4 mi. WNW; Bay View, Delaware	39 - 29 - 02	75 - 35 - 31	IDM
15D1	3.8 mi. NW; Rt. 9, Augustine Beach	39 - 30 - 08	75 - 35 - 02	IDM

TABLE B-1 (cont'd)

STATION CODE	STATION LOCATION	LATITUDINAL DEG. MIN. SEC	LONGITUDINAL DEG. MIN. SEC	SAMPLE TYPE
2E1	4.4 mi. NNE; local farm	39 - 31 - 23	75 - 30 - 26	IDM
3E1	4.1 mi. NE; local farm	39 - 30 - 07	75 - 28 - 41	IDM, WWA
7E1	4.5 mi. SE; 1 mi. W of Mad Horse Creek	39 - 25 - 08	75 - 28 - 64	ESF, ESS, SWA
7E1A	8.87 mi. SE; Located at the end of Bayside Road	39 - 22 - 57	75 - 24 - 24	Alternate SWA
11E2	5.0 mi. SW; Rt. 9	39 - 24 - 20	75 - 35 - 33	IDM
12E1	4.4 mi. WSW; Thomas Landing	39 - 26 - 52	75 - 36 - 59	IDM
13E1	4.2 mi. W; Diehl House Lab	39 - 27 - 59	75 - 36 - 44	IDM
13E3	4.9 mi. W; Local Farm, Odessa, DE	39 - 27 - 17	75 - 37 - 30	MLK, VGT, SOL
16E1	4.1 mi. NNW; Port Penn	39 - 30 - 47	75 - 34 - 34	AIO, APT, IDM, SOL
1F1	5.8 mi. N; Fort Elfsborg	39 - 32 - 43	75 - 31 - 05	AIO, APT, IDM
1F2	7.1 mi. N; midpoint of Delaware River	39 - 33 - 08	75 - 32 - 54	SWA
2F2	8.7 mi. NNE; Pole at Corner of 5th & Howell, Salem	39 - 34 - 38	75 - 28 - 04	IDM
2F3	8.0 mi. NNE; Salem Water Company	39 - 33 - 40	75 - 27 - 18	PWR, PWT
2F5	7.4 mi. NNE; Salem High School	39 - 33 - 27	75 - 28 - 31	IDM
2F6	7.3 mi. NNE; Southern Training Center	39 - 33 - 43	75 - 28 - 48	AIO, APT, IDM
2F9	7.5 mi. NNE; Local Farm , Tilbury Rd, Salem	39 - 33 - 55	75 - 29 - 30	FPV, FPL, SOL
2F10	9.2 mi. NNE; Local Farm, South Broadway (Rt. 49) Pennsville	39 - 35 - 35	75 - 29 - 35	FPV, FPL
3F2	5.1 mi. NE; Hancocks Bridge Municipal Bld	39 - 30 - 25	75 - 27 - 36	IDM
3F3	8.6 mi. NE; Quinton Township School	39 - 32 - 38	75 - 24 - 45	IDM
3F6	6.5 mi. NE; Local Farm, Salem/Hancocks Bridge Road	39 - 32 - 03	75 - 28 - 00	FPV, FPL
3F7	7.2 mi. NE; Local Farm, Beasley Neck Road, RD#3	39 - 32 - 07	75 - 25 - 46	FPV, FPL
4F2	6.0 mi. ENE; Mays Lane, Harmersville	39 - 29 - 58	75 - 26 - 03	IDM
5F1	6.5 mi. E; Canton	39 - 28 - 22	75 - 24 - 59	IDM, SOL
6F1	6.4 mi. ESE; Stow Neck Road	39 - 26 - 24	75 - 25 - 09	IDM
7F2	9.1 mi. SE; Bayside, New Jersey	39 - 22 - 56	75 - 24 - 17	IDM
9F1	5.3 mi. S; D.P.A.L. 48912-30217	39 - 23 - 03	75 - 32 - 32	IDM
10F2	5.8 mi. SSW; Rt. 9	39 - 23 - 01	75 - 34 - 09	IDM
11F1	6.2 mi. SW; Taylor's Bridge Delaware	39 - 24 - 44	75 - 37 - 37	IDM
12F1	9.4 mi. WSW; Townsend Elementary School	39 - 23 - 47	75 - 41 - 18	IDM
13F2	6.5 mi. W; Odessa, Delaware	39 - 27 - 18	75 - 39 - 21	IDM

TABLE B-1 (cont'd)

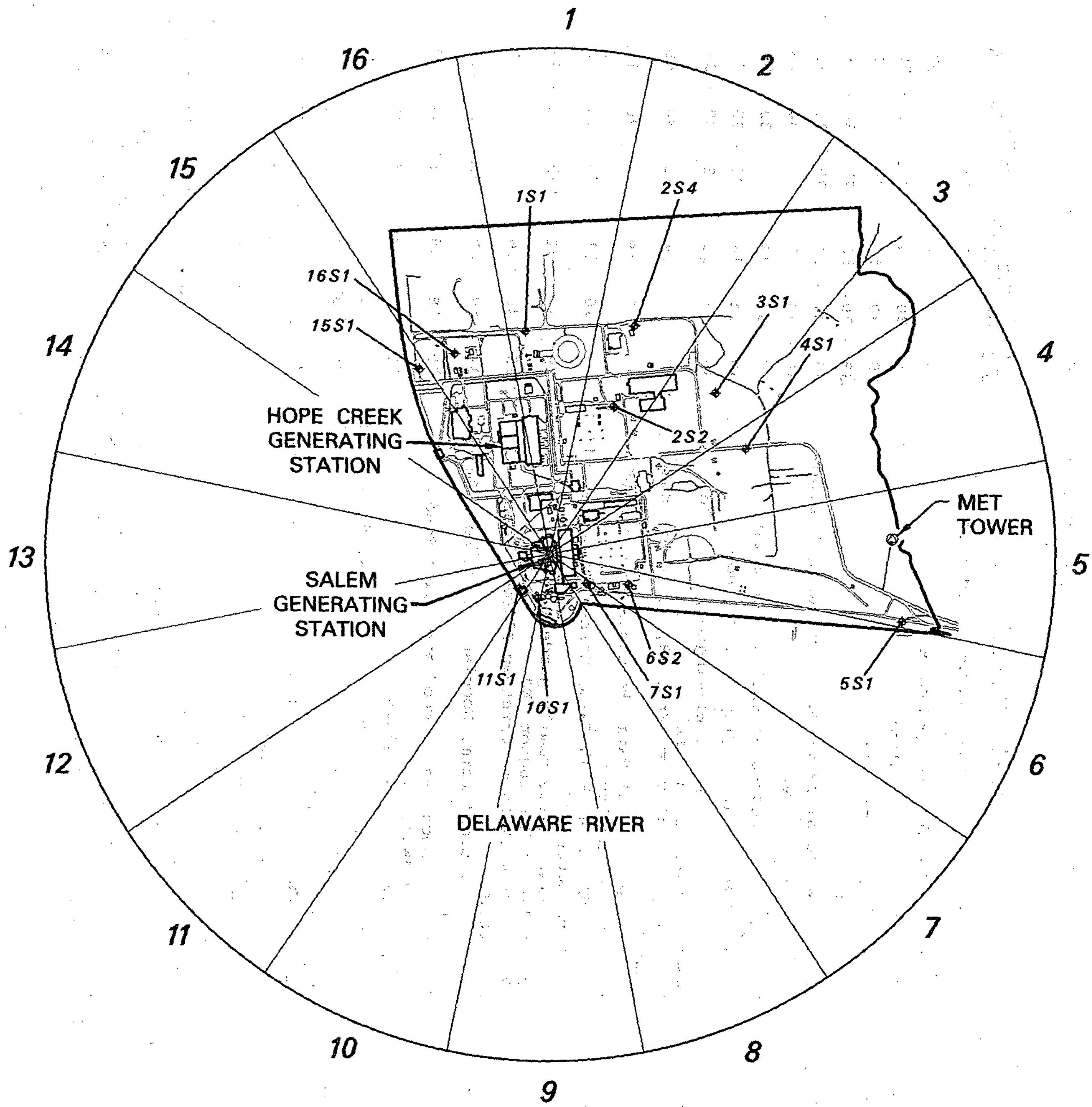
STATION CODE	STATION LOCATION	LATITUDINAL DEG. MIN. SEC	LONGITUDINAL DEG. MIN. SEC	SAMPLE TYPE
13F3	9.3 mi. W; Redding Middle School, Middletown, Delaware	39 - 27 - 14	75 - 42 - 32	IDM
13F4	9.8 mi. W; Middletown, Delaware	39 - 26 - 51	75 - 43 - 07	IDM
14F2	6.6 mi, WNW; Boyds Corner	39 - 30 - 00	75 - 38 - 59	IDM
14F4	7.6 mi. WNW; local farm	39 - 30 - 44	75 - 40 - 52	MLK,VGT,SOL
15F3	5.4 mi. NW	39 - 30 - 58	75 - 36 - 36	IDM
15F4	7.0 mi. NW; local farm; Port Penn Road; Delaware	39 - 31 - 21	75 - 38 - 31	FPV
16F1	6.9 mi. NNW; C&D Canal	39 - 33 - 55	75 - 34 - 25	ESS,SWA
16F1A	6.84 mi. NNW; Located at the C&D Canal tip	39 - 33 - 34	75 - 33 - 56	Alternate SWA
16F2	8.1 mi. NNW; Delaware City Public School	39 - 34 - 18	75 - 35 - 25	IDM
1G3	19 mi. N; N. Church St. Wilmington, Del (Old Swedish Church Yard Park)	39 - 44 - 16	75 - 32 - 31	IDM
1G4	10.8 mi. N; Local Farm, Rte. 49, South Broadway, Pennsville	39 - 37 - 54	75 - 30 - 45	FPV
2G2	13.5 mi. NNE; Local Farm; Pointers Auburn Road (Rt. 540), Salem, NJ 08079	39 - 38 - 19	75 - 26 - 10	FPV
2G3	12 mi. NNE; Local Milk Farm, Corner of Routes 540 & 45, Mannington, NJ	39 - 36 - 21	75 - 24 - 53	MLK,FPV,VGT,SOL
2G4	11.3 mi. NNE; large family garden; Rt 45 & Welchville Rd,Mannington, NJ	39 - 36 - 02	75 - 25 - 21	FPV
3G1	17 mi. NE; Milk Farm; Daretown-Alloway Road; Woodstown	39 - 35 - 56	75 - 16 - 47	IDM,MLK,VGT,SOL
9G1	10.3 mi. S; Local Farm, Woodland Beach Rd., Smyrna, Delaware	39 - 18 - 47	75 - 33 - 50	FPV
9G2	10.7 mi. S; Local Farm, Woodland Beach Road, Smyrna, Delaware	39 - 18 - 39	75 - 34 - 11	FPV,FPL
10G1	12 mi. SSW; Smyrna, Delaware	39 - 18 - 13	75 - 36 - 05	IDM
14G1	11.8 mi. WNW; Rte. 286/Bethel Church Road; Delaware	39 - 31 - 18	75 - 46 - 30	AIO,APT,IDM
14G3	13.73 mi. WNW; Local Milk Farm; Frazier Road, Middletown, Delaware	39 - 33 - 18	75 - 45 - 51	MLK,VGT
16G1	15 mi. NNW; Across from Greater Wilmington Airport	39 - 40 - 38	75 - 35 - 35	IDM
3H1	32 mi. NE; National Park, New Jersey	39 - 51 - 36	75 - 11 - 06	IDM
3H5	25 mi. NE; Farm Market, Rt 77	39 - 41 - 02	75 - 12 - 23	FPL,FPV

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".

All Game (GAM), Vegetables (FPV & FPL) and Vegetation (VGT), are management audit samples. They are not required by the Salem & Hope Creek Stations' Tech Specs nor listed in the Station's ODCM. Vegetable samples are not always collected in consecutive years from the same farmer since they rotate the type of crop they grow.

MAP B-1

SALEM AND HOPE CREEK GENERATING STATIONS RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM ON-SITE SAMPLING LOCATIONS



MAP B–2

SALEM AND HOPE CREEK (HC) GENERATING STATIONS RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM OFF–SITE SAMPLING LOCATION

Plotted on: 4/3/2009 Filename: V:\Projects\Electric\Misc\Island\newdel2.dgn

APPENDIX C

DATA TABLES

APPENDIX C

DATA TABLES

Appendix C presents the analytical results of the 2008 Radiological Environmental Monitoring Program for the period of January 1 to December 31, 2008.

DATA TABLES (cont'd.)

TABLE NUMBER	TABLE DESCRIPTION	PAGE

SPECIAL TABLES

LLDs

Table C-1

2008 CONCENTRATIONS OF GAMMA EMITTERS*
IN QUARTERLY COMPOSITES OF AIR PARTICULATES

Results in Units of 10^{-3} pCi/m^3 +/- 2 sigma

STATION	Sampling Period			<------ Gamma Emitters------>		
ID	Start		Stop	Be-7	K-40	RANAT
SA-APT-5S1	12/26/2007	to	3/31/2008	70±4	10±2	<0.4
SA-APT-1F1	12/26/2007	to	3/31/2008	71±4	10±3	<0.5
SA-APT-2F6	12/26/2007	to	3/31/2008	75±4	16±3	<0.6
SA-APT-5D1	12/26/2007	to	3/31/2008	74±4	12±3	<0.3
SA-APT-16E1	12/26/2007	to	3/31/2008	65±4	14±4	<0.6
SA-APT-14G1(C)	12/26/2007	to	3/31/2008	70±4	11±2	<0.4
SA-APT-5S1	3/31/2008	to	6/30/2008	91±5	11±2	<0.3
SA-APT-1F1	3/31/2008	to	6/30/2008	89±5	12±3	<0.5
SA-APT-2F6	3/31/2008	to	6/30/2008	102±5	13±3	1.1±0.3
SA-APT-5D1	3/31/2008	to	6/30/2008	92±5	13±3	0.8±0.3
SA-APT-16E1	3/31/2008	to	6/30/2008	94±5	17±4	<0.6
SA-APT-14G1(C)	3/31/2008	to	6/30/2008	95±5	10±2	<0.3
SA-APT-5S1	6/30/2008	to	9/29/2008	101±5	8±3	<0.3
SA-APT-1F1	6/30/2008	to	9/29/2008	88±5	11±2	<0.3
SA-APT-2F6	6/30/2008	to	9/29/2008	101±5	12±3	<3.4
SA-APT-5D1	6/30/2008	to	9/29/2008	87±5	8±3	<0.3
SA-APT-16E1	6/30/2008	to	9/29/2008	100±5	10±2	<0.3
SA-APT-14G1(C)	6/30/2008	to	9/29/2008	94±5	11±3	<0.3
SA-APT-5S1	9/29/2009	to	12/29/2008	65±5	10±3	<0.3
SA-APT-1F1	9/29/2009	to	12/29/2008	64±4	8±2	<0.2
SA-APT-2F6	9/29/2009	to	12/29/2008	66±5	12±3	1±0.3
SA-APT-5D1	9/29/2009	to	12/29/2008	63±4	12±3	<0.3
SA-APT-16E1	9/29/2009	to	12/29/2008	63±4	9±3	<0.3
SA-APT-14G1(C)	9/29/2009	to	12/29/2008	62±4	8±2	<0.2
AVERAGE				81±29	11±4	-

* All other gamma emitters searched for were <LLD; typical LLDs are given in Table C-18.
(C) Control Station

TABLE C-2

2008 CONCENTRATIONS OF GROSS BETA EMITTERS IN AIR PARTICULATES
Results in Units of 10^{-3} pCi/m^3 +/- 2 sigma

	<----- STATION ID					----->	
MONTH	Control SA-APT-14G1	SA-APT-16E1	SA-APT-1F1	SA-APT-2F6	SA-APT-5D1	SA-APT-5S1	AVERAGE
January	32±2	29±2	28±2	26±2	24±2	31±2	28±7
	28±3	27±2	26±2	25±2	26±2	28±2	27±2
	14±2	15±2	14±2	(1)	13±2	14±2	14±1
	23±2	23±2	23±2	24±2	20±2	23±2	23±3
	28±2	31±3	29±2	30±2	28±2	33±2	30±4
February	32±2	35±3	38±2	34±2	33±2	26±2	33±8
	23±2	20±2	22±2	21±2	18±2	23±2	21±4
	23±2	23±2	26±2	25±2	24±2	21±2	24±3
	15±2	21±2	22±2	21±2	19±2	20±2	20±5
March	22±2	19±2	25±2	22±2	21±2	24±2	22±4
	21±2	20±2	21±2	20±2	18±2	(2)	20±3
	51±4	51±4	50±4	53±4	51±4	7±7	44±36
	21±2	19±2	22±2	21±2	24±2	26±3	22±5
	21±2	24±2	24±2	23±2	24±2	25±2	24±3
April	14±2	14±2	12±2	13±2	15±2	14±2	13±2
	9±2	8±2	10±2	9±2	7±2	8±2	9±2
	24±2	25±2	25±2	25±2	25±2	27±2	25±2
	24±2	23±2	27±2	25±2	23±2	24±2	24±3
May	22±2	20±2	24±2	23±2	22±2	24±2	22±3
	16±2	19±2	22±2	19±2	16±2	20±2	19±5
	13±2	16±2	17±2	16±2	15±2	16±2	15±2
	13±2	14±2	15±2	12±2	11±2	17±2	13±4
	19±2	20±2	19±2	20±2	18±2	20±2	19±1
June	15±2	13±2	16±2	15±2	14±2	14±2	14±2
	29±2	23±2	29±2	27±2	25±2	25±2	26±5
	18±2	20±2	19±2	17±2	17±2	20±2	18±3
	23±2	22±2	23±3	26±3	20±2	24±3	23±4

TABLE C-2

2008 CONCENTRATIONS OF GROSS BETA EMITTERS IN AIR PARTICULATES

Results in Units of 10^{-3} pCi/m^3 +/- 2 sigma

	<------ STATION ID						------>
MONTH	Control SA-APT-14G1	SA-APT-16E1	SA-APT-1F1	SA-APT-2F6	SA-APT-5D1	SA-APT-5S1	AVERAGE
July	19±2	18±2	19±2	18±2	16±2	18±2	18±2
	22±2	20±2	21±2	19±2	18±2	24±2	21±5
	29±2	25±2	30±2	28±2	25±2	28±2	28±4
	23±2	23±2	19±2	25±2	19±2	26±3	22±6
August	28±2	30±2	29±2	27±2	21±2	35±3	28±9
	23±2	17±2	19±2	25±2	17±2	22±2	21±6
	26±2	24±2	24±2	26±2	22±2	27±2	25±3
	25±2	21±2	23±2	27±2	21±2	25±2	23±5
	23±2	19±2	21±2	23±2	20±2	21±2	21±3
September	22±2	26±3	24±3	26±3	20±2	26±3	24±5
	18±2	17±2	16±2	18±2	13±2	18±2	17±4
	16±2	18±2	22±2	22±2	16±2	23±2	19±6
	15±2	15±2	19±2	21±2	16±2	17±2	17±5
October	20±2	22±2	23±2	26±2	21±2	28±2	23±6
	47±3	54±3	54±3	57±3	28±2	48±3	48±21
	27±2	27±2	29±3	26±2	27±2	30±2	27±3
	19±2	16±2	16±2	18±3	13±2	17±2	17±4
	19±2	24±2	22±2	20±2	20±2	26±2	22±6
November	16±2	15±2	18±2	19±2	15±2	18±2	17±4
	9±2	7±2	8±2	10±2	8±2	8±2	8±2
	29±2	17±2	19±2	24±2	16±2	19±2	21±10
	17±2	16±2	22±2	18±2	18±2	20±2	19±4
December	16±2	18±2	21±2	20±2	19±2	18±2	18±3
	15±2	15±2	15±2	18±2	16±2	(2)	16±2
	15±2	15±2	15±2	18±2	16±2	17±2	16±3
	31±2	30±2	29±2	33±2	31±2	(2)	31±3
AVERAGE	22±16	22±16	23±16	23±16	20±14	22±14	22±14
					GRAND AVERAGE		22±15

(1) Equipment malfunction; results not included in averages. See program deviations.
(2) Power outage; results not included in averages. See program deviations.

TABLE C-3

2008 CONCENTRATIONS OF IODINE-131* IN FILTERED AIR

Results in Units of 10^{-3} pCi/m^{3}

	<-- STATION ID -->					
MONTH	**Control SA-AIO-14G1**	**SA-AIO-16E1**	**SA-AIO-1F1**	**SA-AIO-2F6**	**SA-AIO-5D1**	**SA-AIO-5S1**
January	<3.4	<3.8	<2.4	<7	<1.7	<3.5
	<2.6	<2	<2.4	<8.2	<4.6	<2.2
	<4.5	<4.8	<5.8	(1)	<1.5	<6.7
	<1.8	<1.8	<3	<4.5	<4.5	<2.8
	<3.9	<2.5	<2.2	<2.3	<6.3	<4.2
February	<3.3	<2.8	<3.4	<5.4	<1.5	<2.4
	<3.5	<2.2	<2.8	<2	<2.6	<6
	<2.3	<3.9	<1.3	<1.3	<1.7	<3.2
	<2.7	<2.5	<4.1	<5.6	<3.6	<2.7
March	<2.6	<3.5	<1.7	<4.4	<2	<1.3
	<2.4	<1.6	<2.5	<3.6	<8.5	(2)
	<1.8	<6.8	<2.9	<1.8	<4.2	<2.7
	<4.5	<7.9	<3.5	<5.8	<3.1	<2
	<3.7	<3.1	<5.9	<2.4	<5.3	<2.6
April	<3.9	<3.2	<2	<3.7	<4.9	<2.8
	<1.1	<4	<5.7	<5.9	<5.7	<1.4
	<5.4	<5	<1.7	<3.1	<4.7	<6.9
	<4.4	<2.4	<2	<2.7	<2.3	<3.2
May	<7.9	<3.1	<3.3	<2.4	<2.7	<7
	<2.4	<7.7	<5.3	<3.2	<2.1	<2.3
	<2.3	<2.7	<2.6	<2.4	<3.2	<4.8
	<1.2	<1.8	<4.2	<4.8	<2.2	<2.1
	<3.1	<4	<3.4	<3.2	<5.1	<3.7
June	<1.4	<2.6	<2.9	<1.3	<4.3	<4.8
	<3.9	<1.5	<2.5	<1.7	<1.5	<1.9
	<4.5	<2.6	<2.7	<1.9	<1.6	<4.3
	<3	<1.5	<3.4	<5.7	<3.7	<2.4

TABLE C-3

2008 CONCENTRATIONS OF IODINE-131* IN FILTERED AIR

Results in Units of 10^{-3} pCi/m^3

	<---------- STATION ID ---------->					
MONTH	Control SA-AIO-14G1	SA-AIO-16E1	SA-AIO-1F1	SA-AIO-2F6	SA-AIO-5D1	SA-AIO-5S1
July	<1	<3.9	<2	<4.9	<5.1	<2.2
	<6.7	<2.6	<2.3	<3.8	<4.4	<3.4
	<3.6	<2.7	<1.5	<3.6	<4.7	<4
	<1.6	<2	<3.6	<2.7	<6.2	<3.4
August	<6.9	<3.9	<2.9	<6.6	<3.4	<1.9
	<3.2	<2.9	<1.7	<2.5	<1.9	<3.8
	<2.5	<3.3	<3.3	<3.5	<3	<2.3
	<4.5	<3.1	<1.9	<1.8	<2.4	<2.8
	<3.3	<3.1	<1.7	<2.1	<2.5	<1.6
September	<2.6	<7.7	<5.2	<2.3	<3.7	<3.1
	<2.7	<1.9	<3.7	<1.4	<2.3	<2.8
	<3	<3.8	<2.6	<2.8	<2.4	<3.6
	<2.7	<5.4	<1.7	<3.2	<1.7	<3
October	<2.4	<4.1	<6.2	<2.1	<4.8	<2.7
	<1.4	<2.5	<6.1	<4.4	<1.6	<2.3
	<1.9	<5.8	<6.4	<5.5	<2.2	<2.8
	<5.1	<4.5	<2.8	<5.1	<5.7	<2.5
	<1.8	<2.9	<1	<1.6	<3	<2.5
November	<3.3	<3.9	<4.4	<2.9	<3.8	<2
	<2	<2.3	<2.6	<3.7	<3.2	<3.1
	<2.2	<2.6	<5.1	<4.8	<3.5	<3.2
	<7.9	<5	<5.6	<2.5	<3.1	<2.1
December	<3.5	<2.6	<2.1	<2	<3	<2.5
	<3	<1.9	<2.4	<3.3	<3.5	(2)
	<6.1	<2.2	<5.4	<4.2	<2.8	<3.3
	<4	<1.8	<2.2	<3.9	<4.3	(2)

* I-131 results are corrected for decay to sample stop date.

(1) Equipment malfunction: See program deviations.

(2) Power Outages: See program deviations.

TABLE C-4

2008 DIRECT RADIATION MEASUREMENTS - QUARTERLY TLD RESULTS

Results in mrad/standard month* +/- 2 sigma

STATION ID	JAN to MAR	APR to JUN	JUL to SEP	OCT to DEC	** QTR ELEMENTS AVG
SA-IDM-2S2	4.5±0.4	5.3±0.7	5.4±0.4	5.7±0.7	5.2±1.0
SA-IDM-5S1	3.1±0.4	3.6±0.4	3.5±0.5	4.1±0.4	3.6±0.8
SA-IDM-6S2	5.0±0.7	5.2±0.4	5.2±0.5	5.8±0.5	5.3±0.7
SA-IDM-7S1	5.1±0.5	5.7±0.8	5.7±0.5	5.9±0.6	5.6±0.7
SA-IDM-10S1	3.3±0.5	3.7±0.4	3.6±0.5	4.2±0.5	3.7±0.7
SA-IDM-11S1	2.9±0.3	3.6±0.5	3.3±0.4	4.0±0.7	3.4±0.9
SA-IDM-4D2	4.1±0.3	4.6±0.4	4.5±0.6	4.8±0.5	4.5±0.6
SA-IDM-5D1	3.5±0.4	4.1±0.5	4.0±0.9	4.6±0.5	4.1±0.9
SA-IDM-10D1	4.1±0.3	4.7±0.5	4.9±0.5	5.2±0.5	4.7±0.9
SA-IDM-14D1	3.5±0.3	4.3±0.4	4.3±0.7	4.6±0.7	4.2±0.9
SA-IDM-15D1	4.2±0.5	4.7±0.4	4.8±0.5	5.2±0.5	4.7±0.8
SA-IDM-2E1	3.8±0.3	4.5±0.5	4.3±0.4	4.6±0.5	4.3±0.8
SA-IDM-3E1	3.1±0.4	3.7±0.5	3.6±0.4	3.9±0.4	3.6±0.7
SA-IDM-9F1	4.2±0.6	4.9±0.8	5.0±0.4	5.6±0.7	4.9±1.2
SA-IDM-11E2	4.1±0.4	4.6±0.6	4.7±0.4	5.1±0.6	4.6±0.9
SA-IDM-12E1	4.2±0.4	4.7±0.6	5.0±0.5	4.9±0.6	4.7±0.7
SA-IDM-13E1	3.1±0.4	3.7±0.4	3.8±0.5	4.1±0.5	3.7±0.8
SA-IDM-16E1	4.0±0.4	4.5±0.5	4.5±0.6	4.9±0.5	4.5±0.8
SA-IDM-1F1	5.1±0.4	5.7±0.5	6.0±0.6	6.3±0.7	5.8±1.0
SA-IDM-2F2	3.4±0.5	3.8±0.4	3.6±0.6	4.0±0.4	3.7±0.5
SA-IDM-2F5	4.0±0.6	4.5±0.6	4.5±0.6	4.9±0.5	4.5±0.7
SA-IDM-2F6	3.7±0.3	4.1±0.4	4.0±0.3	4.5±0.4	4.1±0.6
SA-IDM-3F2	3.4±0.3	3.8±0.6	3.8±0.5	4.3±0.6	3.9±0.7
SA-IDM-3F3	3.3±0.3	4.1±0.4	3.8±0.4	4.2±0.6	3.9±0.8
SA-IDM-4F2	3.3±0.4	3.5±0.4	3.7±0.4	4.0±0.7	3.6±0.7
SA-IDM-5F1	3.5±0.4	4.1±0.4	4.0±0.5	4.3±0.4	4.0±0.7
SA-IDM-6F1	2.9±0.3	3.2±0.4	3.2±0.4	3.8±0.4	3.3±0.7
SA-IDM-7F2	2.6±0.2	3.1±0.3	3.0±0.3	3.4±0.4	3.0±0.7
SA-IDM-10F2	3.9±0.4	4.5±0.5	4.9±0.4	5.0±0.5	4.6±1.0
SA-IDM-11F1	4.3±0.4	4.7±0.6	4.9±0.5	5.1±0.5	4.8±0.7
SA-IDM-12F1	3.9±0.4	4.5±0.5	4.5±0.5	4.8±0.5	4.4±0.7
SA-IDM-13F2	3.9±0.4	4.2±0.4	4.6±0.4	5.1±0.6	4.4±1.1
SA-IDM-13F3	3.8±0.4	4.3±0.5	4.6±0.5	4.9±0.5	4.4±0.9
SA-IDM-13F4	4.4±0.7	4.9±0.7	5.0±0.5	5.3±0.5	4.9±0.8
SA-IDM-14F2	4.1±0.5	4.8±0.6	4.9±0.4	5.2±0.6	4.7±0.9
SA-IDM-15F3	4.5±0.4	5.0±0.5	5.2±0.6	5.4±0.5	5.0±0.8
SA-IDM-16F2	3.5±0.5	4.0±0.4	4.0±0.4	4.3±0.4	4.0±0.6
SA-IDM-1G3 (C)	4.9±0.6	5.4±0.6	5.4±0.5	5.8±0.7	5.4±0.7
SA-IDM-3G1 (C)	4.0±0.5	4.7±0.6	4.6±0.4	5.1±0.6	4.6±0.9
SA-IDM-10G1(C)	3.7±0.5	4.3±0.4	4.4±0.4	4.7±0.5	4.3±0.8
SA-IDM-16G1(C)	3.7±0.5	4.3±0.5	4.1±0.5	4.5±0.4	4.2±0.7
SA-IDM-3H1 (C)	3.3±0.3	3.6±0.3	3.5±0.4	4.2±0.5	3.7±0.7
SA-IDM-1S1	4.1±0.4	4.5±0.4	5.0±0.6	5.5±0.6	4.8±1.2
SA-IDM-3S1	3.0±0.3	3.3±0.5	3.4±0.4	3.8±0.4	3.4±0.7
SA-IDM-2S4	3.7±0.3	4.1±0.5	4.2±0.5	4.6±0.4	4.1±0.7
SA-IDM-4S1	3.5±0.4	4.1±0.5	4.2±0.4	4.6±0.5	4.1±0.9
SA-IDM-15S1	3.2±0.4	3.6±0.3	3.5±0.5	3.9±0.4	3.5±0.6
SA-IDM-16S1	3.8±0.3	4.2±0.4	4.2±0.4	4.6±0.5	4.2±0.7
SA-IDM-14G1(C)	4.1±0.5	4.6±0.4	4.8±0.7	5.3±1.2	4.7±1.1
AVERAGE	3.8±1.2	4.3±1.2	4.4±1.4	4.7±1.3	
			GRAND AVG		4.3±1.4

* The standard month = 30.4 days.
** Quarterly Element TLD results by AREVA - NP Environmental Laboratory.
(C) Control Station

TABLE C-5

2008 CONCENTRATIONS OF IODINE-131* AND GAMMA EMITTERS** IN MILK

Results in Units of pCi/L +/- 2 sigma

	*** SAMPLING PERIOD			<---- GAMMA EMITTERS ---->	
STATION ID	START	STOP	I-131	K-40	RA-NAT
SA-MLK-2G3	1/7/2008	1/8/2008	<0.2	1350 ±70	11 ±4
SA-MLK-13E3	1/7/2008	1/8/2008	<0.3	1310 ±69	<4.1
SA-MLK-14F4	1/7/2008	1/8/2008	<0.2	1280 ±74	<3.8
SA-MLK-3G1 (C)	1/7/2008	1/8/2008	<0.2	1310 ±74	<3.1
SA-MLK-2G3	2/3/2008	2/4/2008	<0.3	1310 ±72	<5
SA-MLK-13E3	2/4/2008	2/4/2008	<0.2	1360 ±73	<3.4
SA-MLK-14F4	2/3/2008	2/4/2008	<0.2	1280 ±66	<3.8
SA-MLK-3G1 (C)	2/3/2008	2/4/2008	<0.2	1260 ±67	<4.6
SA-MLK-2G3	3/2/2008	3/3/2008	<0.2	1230 ±70	<4.7
SA-MLK-13E3	3/2/2008	3/3/2008	<0.2	1330 ±72	<2.9
SA-MLK-14F4	3/2/2008	3/3/2008	<0.3	1330 ±71	<3
SA-MLK-3G1 (C)	3/2/2008	3/3/2008	<0.3	1240 ±73	<3.5
SA-MLK-2G3	4/6/2008	4/7/2008	<0.2	1260 ±74	<3.2
SA-MLK-13E3	4/6/2008	4/7/2008	<0.2	1400 ±75	<4.5
SA-MLK-14F4	4/6/2008	4/7/2008	<0.2	1280 ±78	<3.6
SA-MLK-3G1 (C)	4/6/2008	4/7/2008	<0.2	1280 ±72	<3
SA-MLK-2G3	4/20/2008	4/21/2008	<0.1	1340 ±74	<3.6
SA-MLK-13E3	4/20/2008	4/21/2008	<0.3	1450 ±76	<3.8
SA-MLK-14F4	4/20/2008	4/21/2008	<0.2	1440 ±70	<3.7
SA-MLK-3G1 (C)	4/20/2008	4/21/2008	<0.1	1330 ±69	<4.4
SA-MLK-2G3	5/4/2008	5/5/2008	<0.3	1360 ±74	<5.1
SA-MLK-13E3	5/4/2008	5/5/2008	<0.2	1430 ±76	<2.9
SA-MLK-14F4	5/4/2008	5/5/2008	<0.3	1390 ±73	<4.2
SA-MLK-3G1 (C)	5/4/2008	5/5/2008	<0.1	1280 ±64	<3.5
SA-MLK-2G3	5/18/2008	5/19/2008	<0.1	1380 ±74	<3.1
SA-MLK-13E3	5/18/2008	5/19/2008	<0.2	1360 ±70	<3.6
SA-MLK-14F4	5/18/2008	5/19/2008	<0.2	1340 ±68	<3.5
SA-MLK-3G1 (C)	5/18/2008	5/19/2008	<0.1	1330 ±72	<2.9
SA-MLK-2G3	6/1/2008	6/2/2008	<0.2	1360 ±74	<6.2
SA-MLK-13E3	6/1/2008	6/2/2008	<0.2	1300 ±72	<3
SA-MLK-14F4	6/1/2008	6/2/2008	<0.3	1390 ±70	<3.9
SA-MLK-3G1 (C)	6/1/2008	6/2/2008	<0.2	1200 ±70	<3.1
SA-MLK-2G3	6/15/2008	6/16/2008	<0.2	1340 ±70	<3.7
SA-MLK-13E3	6/15/2008	6/16/2008	<0.2	1270 ±95	<3.7
SA-MLK-14F4	6/15/2008	6/16/2008	<0.2	1460 ±75	<2.9
SA-MLK-3G1 (C)	6/15/2008	6/16/2008	<0.3	1250 ±69	<3.3
SA-MLK-2G3	7/6/2008	7/7/2008	<0.2	1360 ±74	<3.2
SA-MLK-13E3	7/6/2008	7/7/2008	<0.2	1420 ±72	<3.5
SA-MLK-14G3 (1)	7/6/2008	7/7/2008	<0.3	1390 ±69	<3.4
SA-MLK-3G1 (C)	7/6/2008	7/7/2008	<0.2	1220 ±72	<3
SA-MLK-2G3	7/20/2008	7/21/2008	<0.2	1370 ±72	<3.6
SA-MLK-13E3	7/20/2008	7/21/2008	<0.2	1380 ±69	<2.9
SA-MLK-14G3 (1)	7/20/2008	7/21/2008	<0.2	1330 ±73	<2.8
SA-MLK-3G1 (C)	7/20/2008	7/21/2008	<0.2	1230 ±67	<2.9

TABLE C-5

2008 CONCENTRATIONS OF IODINE-131* AND GAMMA EMITTERS** IN MILK

Results in Units of pCi/L +/- 2 sigma

	SAMPLING PERIOD ***			<---- GAMMA EMITTERS ---->	
STATION ID	START	STOP	I-131	K-40	RA-NAT
SA-MLK-2G3	8/3/2008	8/4/2008	<0.3	1290 ±75	<3.3
SA-MLK-13E3	8/3/2008	8/4/2008	<0.2	1380 ±76	<2.9
SA-MLK-14G3 (1)	8/3/2008	8/4/2008	<0.2	1370 ±69	<3.1
SA-MLK-3G1 (C)	8/3/2008	8/4/2008	<0.2	1260 ±72	<2.9
SA-MLK-2G3	8/17/2008	8/18/2008	<0.2	1380 ±70	<3.6
SA-MLK-13E3	8/17/2008	8/18/2008	<0.2	1300 ±75	<3
SA-MLK-14G3 (1)	8/17/2008	8/18/2008	<0.2	1320 ±74	<2.9
SA-MLK-3G1 (C)	8/17/2008	8/18/2008	<0.2	1300 ±70	<2.9
SA-MLK-2G3	9/1/2008	9/2/2008	<0.2	1230 ±72	<3.4
SA-MLK-13E3	9/1/2008	9/2/2008	<0.2	1370 ±69	<3.1
SA-MLK-14G3 (1)	9/1/2008	9/2/2008	<0.3	1120 ±89	<3
SA-MLK-3G1 (C)	9/2/2008	9/3/2008	<0.3	1390 ±72	<2.9
SA-MLK-2G3	9/14/2008	9/15/2008	<0.2	1290 ±69	<3.2
SA-MLK-13E3	9/14/2008	9/15/2008	<0.2	1430 ±71	<3
SA-MLK-14G3 (1)	9/14/2008	9/15/2008	<0.2	1390 ±74	<3.1
SA-MLK-3G1 (C)	9/14/2008	9/15/2008	<0.2	1270 ±72	<3.3
SA-MLK-2G3	10/5/2008	10/6/2008	<0.2	1400 ±73	<2.9
SA-MLK-13E3	10/5/2008	10/6/2008	<0.2	1370 ±74	<3.3
SA-MLK-14G3 (1)	10/5/2008	10/6/2008	<0.3	1370 ±76	<3
SA-MLK-3G1 (C)	10/5/2008	10/6/2008	<0.2	1360 ±73	<3
SA-MLK-2G3	10/19/2008	10/20/2008	<0.3	1360 ±71	<3.2
SA-MLK-13E3	10/20/2008	10/20/2008	<0.2	1290 ±71	<3.3
SA-MLK-14G3 (1)	10/19/2008	10/20/2008	<0.3	1290 ±72	<2.8
SA-MLK-3G1 (C)	10/19/2008	10/20/2008	<0.2	1330 ±74	<3.1
SA-MLK-2G3	11/2/2008	11/3/2008	<0.2	1300 ±73	<3.1
SA-MLK-13E3	11/2/2008	11/3/2008	<0.2	1310 ±74	<3.3
SA-MLK-14G3 (1)	11/2/2008	11/3/2008	<0.2	1270 ±68	<2.9
SA-MLK-3G1 (C)	11/2/2008	11/3/2008	<0.2	1390 ±75	<2.4
SA-MLK-2G3	11/16/2008	11/17/2008	<0.2	1280 ±71	<3.3
SA-MLK-13E3	11/16/2008	11/17/2008	<0.2	1310 ±73	<2.5
SA-MLK-14G3 (1)	11/16/2008	11/17/2008	<0.3	1330 ±72	<3.1
SA-MLK-3G1 (C)	11/16/2008	11/17/2008	<0.2	1270 ±66	<3.2
SA-MLK-2G3	11/30/2008	12/1/2008	<0.2	1470 ±77	<2.7
SA-MLK-13E3	11/30/2008	12/1/2008	<0.3	1390 ±68	<2.9
SA-MLK-14G3 (1)	11/30/2008	12/1/2008	<0.2	1310 ±74	<3.4
SA-MLK-3G1 (C)	12/1/2008	12/1/2008	<0.2	1390 ±74	<3.1
AVERAGE			-	1330 ±130	-

* Iodine-131 results are corrected for decay to stop date of collection period & analyzed to an LLD of 1.0 pCi/L.

** All other gamma emitters searched for were <LLD; typical LLDs are given in Table C-19

*** Monthly sample collected during Jan., Feb., March and Dec., when animals are not on pasture.

(C) Control Station

(1) Location 14F4 had the barn & milking shed burn down the last week of June. Most of his cows were sent to Location 14G3 where we collected a sample from July through December.

TABLE C-6

2008 CONCENTRATIONS OF GROSS ALPHA AND GROSS BETA EMITTERS, AND TRITIUM IN WELL WATER (Ground Water)*

Results in Units of pCi/L +/- 2 sigma

STATION ID	SAMPLING DATE	GROSS ALPHA	GROSS BETA	TRITIUM
SA-WWA-3E1	1/28/2008	<1.2	11±0.9	<155
SA-WWA-3E1	2/25/2008	1±0.7	8.4±0.9	<142
SA-WWA-3E1	3/31/2008	<0.8	10±0.9	<142
SA-WWA-3E1	4/28/2008	<0.8	11±1.1	<141
SA-WWA-3E1	5/27/2008	<0.9	12±1	<139
SA-WWA-3E1	6/25/2008	<0.5	8.9±0.9	<143
SA-WWA-3E1	7/28/2008	<1	11±1	<134
SA-WWA-3E1	8/25/2008	<1	10±1.1	<134
SA-WWA-3E1	9/29/2008	<1	10±0.9	<143
SA-WWA-3E1	10/25/2009	<1.1	10±1	<142
SA-WWA-3E1	11/24/2008	<0.9	10±0.9	<139
SA-WWA-3E1	12/29/2008	<0.5	10±1	<140
AVERAGE		-	10±2	-

* Management Audit Sample : not required by ODCM.

TABLE C-7

2008 CONCENTRATIONS OF GAMMA EMITTERS* IN WELL WATER**

Results in Units of pCi/L +/- 2 sigma

STATION ID	SAMPLING DATE	<-----GAMMA EMITTERS -----> K-40	RA-NAT
SA-WWA-3E1	1/28/2008	<18	176±7
SA-WWA-3E1	2/25/2008	<17	159±4
SA-WWA-3E1	3/27/2008	<19	153±6
SA-WWA-3E1	4/28/2008	<16	254±8
SA-WWA-3E1	5/27/2008	<20	68±4
SA-WWA-3E1	6/25/2008	<26	66±4
SA-WWA-3E1	7/28/2008	48±19	162±4
SA-WWA-3E1	8/25/2008	<38	118±5
SA-WWA-3E1	9/29/2008	<32	98±4
SA-WWA-3E1	10/25/2008	<25	114±4
SA-WWA-3E1	11/24/2008	<15	99±3
SA-WWA-3E1	12/29/2008	61±17	185±5
AVERAGE		-	138±109

* All other gamma emitters searched for were <LLD; typical LLDs are given in Table C-18.
** Management Audit Samples: not required by ODCM.

TABLE C-8

2008 CONCENTRATIONS OF GROSS ALPHA AND GROSS BETA EMITTERS AND TRITIUM IN RAW AND TREATED POTABLE WATER (2F3)*

Results in Units of pCi/L +/- 2 sigma

TYPE	SAMPLING PERIOD	GROSS ALPHA	GROSS BETA	TRITIUM
RAW	1/1-31/2008	<0.5	2.7±0.5	<155
TREATED	1/1-31/2008	<0.5	2.4±0.5	<150
RAW	2/1-28/2008	<0.4	3.1±0.5	<139
TREATED	2/1-28/2008	<0.6	3.5±0.7	<140
RAW	3/1-31/2008	<0.4	2.6±0.5	<143
TREATED	3/1-31/2008	<0.5	2.9±0.6	<143
RAW	4/1-30/2008	<0.4	3.2±0.7	<141
TREATED	4/1-30/2008	<0.6	3.5±0.7	<143
RAW	5/1-31/2008	<0.4	3.1±0.6	<139
TREATED	5/1-31/2008	<0.6	2.8±0.6	<140
RAW	6/1-30/2008	0.4±0.3	2±0.5	<134
TREATED	6/1-30/2008	<0.3	2.6±0.6	<143
RAW	7/1-31/2008	0.5±0.4	2.5±0.6	<134
TREATED	7/1-31/2008	<0.4	1.9±0.5	<134
RAW	8/1-31/2008	<0.5	2.9±0.8	<136
TREATED	8/1-31/2008	<0.6	3.1±0.8	<135
RAW	9/1-30/2008	<0.5	2.4±0.6	<142
TREATED	9/1-30/2008	<0.5	2.2±0.5	<143
RAW	10/1-31/2008	<0.5	2.7±0.6	<141
TREATED	10/1-31/2008	<0.5	2.2±0.6	<142
RAW	11/1-30/2008	<0.4	2.1±0.5	<142
TREATED	11/1-30/2008	<0.6	2.8±0.6	<144
RAW	12/1-31/2008	0.6±0.3	3±0.6	<142
TREATED	12/1-31/2008	<0.3	2.6±0.6	<141
AVERAGE				
RAW		-	2.7±0.8	-
TREATED		-	2.7±1	-
GRAND AVERAGE		-	2.7±0.9	-

* Managemnent Audit Sample: not required by ODCM.

TABLE C-9

2008 CONCENTRATIONS OF IODINE-131* AND GAMMA EMITTERS**
IN RAW AND TREATED POTABLE WATER (2F3)***

Results in Units of pCi/L +/- 2 sigma

TYPE	SAMPLING PERIOD	I-131	<---GAMMA EMITTERS ---> K-40	RA-NAT
RAW	1/1-31/2008	<0.1	<16	9±3
TREATED	1/1-31/2008	<0.2	<18	<2.6
RAW	2/1-28/2008	<0.3	30±14	<2.2
TREATED	2/1-28/2008	<0.2	57±16	<2.1
RAW	3/1-31/2008	<0.3	<15	<2.1
TREATED	3/1-31/2008	<0.2	50±16	3±1
RAW	4/1-30/2008	<0.2	51±15	<2
TREATED	4/1-30/2008	<0.2	43±15	5±2
RAW	5/1-31/2008	<0.2	50±14	<1.8
TREATED	5/1-31/2008	<0.2	28±10	<2
RAW	6/1-30/2008	<0.1	50±16	<4.2
TREATED	6/1-30/2008	<0.1	<15	21±3
RAW	7/1-31/2008	<0.2	<16	<2.4
TREATED	7/1-31/2008	<0.2	<10	<1.8
RAW	8/1-31/2008	<0.2	8±3	<2.5
TREATED	8/1-31/2008	<0.3	<14	<2
RAW	9/1-30/2008	<0.2	57±18	<3
TREATED	9/1-30/2008	<0.2	<16	<2
RAW	10/1-31/2008	<0.2	41±13	<2.3
TREATED	10/1-31/2008	<0.3	57±16	<2.1
RAW	11/1-30/2008	<0.3	43±15	<1.7
TREATED	11/1-30/2008	<0.1	40±15	<1.5
RAW	12/1-31/2008	<0.2	53±14	<1.7
TREATED	12/1-31/2008	<0.3	<15	24±2
AVERAGES				
RAW		-	36±36	-
TREATED		-	36±30	-
GRAND AVERAGE		-	33±36	-

* Iodine-131 analyzed to an LLD of 1.0 pCi/L.
** All other gamma emitters searched for were <LLD; typical LLDs are given in Table C-18
*** Management Audit Sample: not required by ODCM.

TABLE C-10

2008 CONCENTRATIONS OF GAMMA EMITTERS* IN VEGETABLES**
Results in Units of pCi/kg (Wet) +/- 2 sigma

STATION ID	SAMPLING DATE	SAMPLE TYPE	<--- GAMMA EMITTERS ---> K-40	RA-NAT
SA-FPV-2F9	5/3/2008	Asparagus	1860±148	<8.3
SA-FPV-2G2 (C)	5/3/208	Asparagus	2060±184	<7.3
SA-FPL-3H5 (C)	4/30/2008	Asparagus	2160±188	<13
AVERAGE			2030±310	-
SA-FPL-3H5 (C)	7/25/2008	Cabbage	1850±160	<8.9
AVERAGE			1850±160	-
SA-FPV-2F9	7/26/2008	Corn	2090±142	<9.8
SA-FPV-2F10	7/26/2008	Corn	2110±159	<7.2
SA-FPV-3F6	8/3/2008	Corn	2090±149	<5
SA-FPV-2G2 (C)	7/19/2008	Corn	2140±153	<7.7
SA-FPV-9G2 (C)	8/7/2008	Corn	2150±163	<8.3
SA-FPV-3H5 (C)	7/19/2008	Corn	2190±159	<8.2
SA-FPV-15F4	7/11/2008	Corn	2270±159	<8.4
AVERAGE			2150±130	-
SA-FPV-2F9	7/26/2008	Peppers	1620±151	<10
SA-FPV-2F9	8/3/2008	Peppers	1410±148	<8.8
SA-FPV-2F10	7/26/2008	Peppers	1370±147	<9.8
SA-FPV-3F7	7/27/2008	Peppers	1550±146	<9.3
SA-FPV-2G2 (C)	7/19/2008	Peppers	1430±145	<8.1
SA-FPV-9G2 (C)	8/7/2008	Peppers	1750±149	<7.2
SA-FPV-3H5 (C)	7/19/2008	Peppers	1380±139	<7.8
AVERAGE			1500±290	-
SA-FPV-2F10	7/26/2008	Tomatoes	1710±121	<6.1
SA-FPV-3F6	7/27/2008	Tomatoes	2210±154	<6.6
SA-FPV-3F7	7/27/2008	Tomatoes	2420±165	<7.8
SA-FPV-2G2 (C)	7/19/2008	Tomatoes	2240±164	<7.8
SA-FPV-2G4 (C)	7/27/2008	Tomatoes	1830±140	<7
SA-FPV-9G1 (C)	8/3/2008	Tomatoes	1930±152	<7.8
SA-FPV-3H5 (C)	7/19/2008	Tomatoes	1900±145	<8.2
SA-FPV-15F4	8/3/2008	Tomatoes	2020±143	<7.6
SA-FPV-2F9	7/26/2008	Tomatoes	2620±162	<6.4
AVERAGE			2100±590	-
GRAND AVERAGE			1940±660	-

* All other gamma emitters searched for were <LLD; typical LLDs are given in Table C-18.
** Management Audit Sample: not required by ODCM.
(C) Control Station

TABLE C-11

2008 CONCENTRATIONS OF GAMMA EMITTERS* IN FODDER CROPS **

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

STATION ID	SAMPLING DATE	SAMPLE TYPE	<--------- GAMMA EMITTERS ---------> Be-7	K-40	RA-NAT
SA-VGT-1S1	12/18/2008	Ornamental Cabbage	<62	3280±253	<12
SA-VGT-10D1	12/18/2008	Ornamental Cabbage	167±53	2420±227	<12
SA-VGT-15S1	12/18/2008	Ornamental Cabbage	<60	2300±204	<12
SA-VGT-16S1	12/18/2008	Ornamental Cabbage	<92	2970±233	<12
AVERAGE			-	2740±920	-
SA-VGT-2G3	10/1-11/17/08	Silage	255±52.2	3060±210	<6.4
SA-VGT-3G1 (C)	10/1-11/17/08	Silage	137±33.8	2030±107	<5.3
SA-VGT-13E3	10/1-11/17/08	Silage	142±37	3220±169	<6.2
SA-VGT-14G3	10/1-11/17/08	Silage	231±30.4	1970±91	<3.6
AVERAGE			190±120	2770±1290	-
SA-VGT-14F4	10/17/2008	Soybeans	<26.5	16200±285	<12
SA-VGT-3G1 (C)	11/28/2008	Soybeans	<75.7	13100±262	11±5
AVERAGE			-	14700±4384	-

* All other gamma emitters searched for were <LLD; typical LLDs are given in Table C-18.
** Management Audit Sample: not required by ODCM.
(C) Control Station

TABLE C-12

2008 CONCENTRATIONS OF GROSS BETA EMITTERS IN SURFACE WATER

Results in Units of pCi/L +/- 2 sigma

SAMPLING DATE	SA-SWA-11A1	SA-SWA-12C1 (Control)	SA-SWA-16F1	SA-SWA-1F2	SA-SWA-7E1	AVERAGE
	<------ STATION ID				------>	
January	87±8	67±7	42±5	21±4	146±11	73±96
February	84±8	43±5	34±6	18±4	91±8	54±64
March	63±7	51±6	51±6	8±4	90±9	53±59
April	43±5	24±4	14±4	10±4	78±7	34±56
May	79±8	50±6	42±6	28±5	134±11	67±83
June	56±7	38±6	33±6	20±5	114±10	52±73
July	121±10	66±7	61±7	31±5	164±13	88±106
August	116±10	72±8	51±6	46±6	186±15	94±116
September	292±22	125±12	129±12	88±10	330±28	193±220
October	234±17	119±10	102±9	77±8	302±22	167±193
November	262±24	158±18	144±17	94±14	212±21	174±129
December	79±10	60±9	46±8	37±8	89±11	62±44
AVERAGE	126±172	73±81	62±81	40±60	161±167	
				GRAND AVERAGE		92±148

TABLE C-13

2008 CONCENTRATIONS OF GAMMA EMITTERS* IN SURFACE WATER

Results in Units of pCi/L +/- 2 sigma

STATION ID	SAMPLING DATE	<--------GAMMA EMITTERS--------> K-40	RA-NAT
SA-SWA-1F2	1/7/2008	75±18	<2.7
SA-SWA-7E1	1/7/2008	160±20	6.4±3
SA-SWA-11A1	1/7/2008	86±16	<2.7
SA-SWA-12C1(C)	1/7/2008	97±17	<2.6
SA-SWA-16F1	1/7/2008	93±18	<2.3
SA-SWA-1F2	2/4/2008	76±18	<5.2
SA-SWA-7E1	2/4/2008	92±18	<2.6
SA-SWA-11A1	2/4/2008	113±22	<2.2
SA-SWA-12C1 (C)	2/4/2008	83±16	<2.1
SA-SWA-16F1	2/4/2008	61±16	<2.3
SA-SWA-1F2	3/3/2008	61±19	<2.8
SA-SWA-7E1	3/3/2008	91±15	<2.2
SA-SWA-11A1	3/3/2008	55±19	<2.2
SA-SWA-12C1(C)	3/3/2008	66±16	<2
SA-SWA-16F1	3/3/2008	52±17	<2.5
SA-SWA-1F2	4/8/2008	51±15	<1.9
SA-SWA-7E1	4/8/2008	109±18	<2.3
SA-SWA-11A1	4/8/2008	95±15	<3
SA-SWA-12C1(C)	4/8/2008	61±17	<1.9
SA-SWA-16F1	4/8/2008	51±12	<2.2
SA-SWA-1F2	5/5/2008	59±17	<1.7
SA-SWA-7E1	5/5/2008	121±22	<1.9
SA-SWA-11A1	5/5/2008	103±20	<5.6
SA-SWA-12C1(C)	5/5/2008	77±17	<2.2
SA-SWA-16F1	5/5/2008	71±16	<2.1
SA-SWA-1F2	6/5/2008	56±12	<1.8
SA-SWA-7E1	6/5/2008	109±21	<1.7
SA-SWA-11A1	6/5/2008	90±15	<2.2
SA-SWA-12C1(C)	6/5/2008	69±15	6.1±1
SA-SWA-16F1	6/5/2008	65±16	<2.1
SA-SWA-1F2	7/7/2008	89±17	<2.4
SA-SWA-7E1	7/7/2008	89±19	<2
SA-SWA-11A1	7/7/2008	120±21	<1.7
SA-SWA-12C1(C)	7/7/2008	71±16	<6.6
SA-SWA-16F1	7/7/2008	80±19	<1.7

TABLE C-13

2008 CONCENTRATIONS OF GAMMA EMITTERS* IN SURFACE WATER

Results in Units of pCi/L +/- 2 sigma

STATION ID	SAMPLING DATE	<-------GAMMA EMITTERS-------> K-40	RA-NAT
SA-SWA-1F2	8/4/2008	87±20	<1.7
SA-SWA-7E1	8/4/2008	157±20	<1.5
SA-SWA-11A1	8/4/2008	94±20	<2.1
SA-SWA-12C1(C)	8/4/2008	88±17	<2.2
SA-SWA-16F1	8/4/2008	61±18	<2.2
SA-SWA-1F2	9/2/2008	126±16	<1.7
SA-SWA-7E1	9/2/2008	125±21	<2.2
SA-SWA-11A1	9/2/2008	128±22	<1.6
SA-SWA-12C1(C)	9/2/2008	110±18	<1.7
SA-SWA-16F1	9/2/2008	81±16	<2.3
SA-SWA-1F2	10/7/2008	67±18	<1.7
SA-SWA-7E1	10/7/2008	128±21	<2.3
SA-SWA-11A1	10/7/2008	166±24	<1.7
SA-SWA-12C1(C)	10/7/2008	79±22	<1.8
SA-SWA-16F1	10/7/2008	113±18	<1.6
SA-SWA-1F2	11/7/2008	80±19	<1.7
SA-SWA-7E1	11/7/2008	138±24	<4.1
SA-SWA-11A1	11/7/2008	186±22	<1.7
SA-SWA-12C1 (C)	11/7/2008	115±18	<2
SA-SWA-16F1	11/7/2008	91±19	<2.4
SA-SWA-1F2	12/3/2008	43±14	<2.2
SA-SWA-7E1	12/3/2008	92±18	<2.2
SA-SWA-11A1	12/3/2008	89±20	<1.6
SA-SWA-12C1(C)	12/3/2008	49±18	<4.8
SA-SWA-16F1	12/3/2008	60±15	<1.6
AVERAGE		91±62	-

* All other gamma emitters searched for were <LLD; typical LLDs are given in Table C-18
(C) Control Station

TABLE C-14

2008 CONCENTRATIONS OF TRITIUM IN SURFACE WATER

Results in Units of pCi/L +/- 2 sigma

SAMPLING PERIOD	<------------------ STATION ID ------------------>					
	SA-SWA-11A1	SA-SWA-12C1 (Control)	SA-SWA-16F1	SA-SWA-1F2	SA-SWA-7E1	AVERAGE
January	<140	<140	<140	<140	<140	-
February	<140	<140	<140	<140	<140	-
March	<140	<140	<140	<140	<140	-
April	<140	<140	<140	<140	<140	-
May	<150	<150	<150	<150	<150	-
June	<150	<140	<140	<150	<140	-
July	<140	<140	<140	<140	<140	-
August	<130	<130	<130	<130	<130	-
September	<130	<130	<130	<130	<130	-
October	<135	<150	<140	<140	<140	-
November	150±90	210±90	<140	<140	<140	-
December	<140	<140	<140	140±80	<130	-

TABLE C-15

2008 CONCENTRATIONS OF GAMMA EMITTERS** IN EDIBLE FISH

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

STATION ID	SAMPLING PERIOD	GAMMA EMITTERS (FLESH) K-40
SA-ESF-7E1	6/5/2008	3600±200
SA-ESF-11A1	6/5/2008	3320±180
SA-ESF-12C1 (C)	6/5-6/2008	3540±190
AVERAGE		3490±290
SA-ESF-7E1	9/4/2008	3730±200
SA-ESF-11A1	9/10-10/08/08	3720±200
SA-ESF-12C1 (C)	9/4/2008	3770±190
AVERAGE		3740±50
GRAND AVERAGE		3610±340

** All other gamma emitters searched for were <LLD; typical LLDs are given in Table C-18
(C) Control Station

TABLE C-16

2008 CONCENTRATIONS OF GAMMA EMITTERS* IN CRABS

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

		<---- GAMMA EMITTERS ----> (FLESH)	
STATION ID	SAMPLING PERIOD	K-40	RANAT
SA-ECH-11A1	6/23-7/01/2008	2460±160	16±6
SA-ECH-12C1 (C)	6/23-7/01/2008	2530±150	24±10
AVERAGE		2500±100	20±10
SA-ECH-11A1	8/28-9/02/2008	2600±170	<7.8
SA-ECH-12C1 (C)	8/28-9/02/2008	2690±180	<8
AVERAGE		2650±130	-
GRAND AVERAGE		2570±200	-

* All other gamma emitters searched for were <LLD; Typical LLDs are giver Table C-18.
(C) Control Station

TABLE C-17

2008 CONCENTRATIONS OF GAMMA EMITTERS* IN SEDIMENT

Results in Units of pCi/kg (dry) +/- 2 sigma

STATION ID	SAMPLING DATE	Be-7	K-40	Co-60	Cs-137	RA-NAT	Th-232
SA-ESS-6S2	6/9/2008	<54	1830±113	<2.9	<10	242±11	277±26
SA-ESS-7E1	5/30/2008	233±99	12400±337	<29	<20	688±20	838±56
SA-ESS-11A1	5/30/2008	<35	2090±123	<7.9	<4.7	321±11	355±28
SA-ESS-15A1	5/30/2008	157±68	4920±243	<7.1	<14	359±14	532±46
SA-ESS-16A1	5/30/2008	<90	5520±199	<6.1	<12	574±15	734±47
SA-ESS-12C1 (C)	5/30/2008	<63	11900±323	<9.3	<12	670±20	897±55
SA-ESS-16F1	5/30/2008	<128	6780±217	<11	<7.4	280±12	360±30
AVERAGE			6500±8500	-	-	450±380	570±510
SA-ESS-6S2	11/24/2008	308±55	3040±141	<4.6	<3.8	121±7.7	301±22
SA-ESS-7E1	11/20/2008	<69	11800±352	<14	<27	663±25	859±72
SA-ESS-11A1	11/20/2008	<67	5500±237	<17	<9.7	342±14	446±40
SA-ESS-15A1	11/20/2008	<60	4450±198	<7.6	<15	262±11	409±32
SA-ESS-16A1	11/20/2008	<67	4550±207	<16	<6.4	813±18	958±44
SA-ESS-12C1 (C)	11/20/2008	<35	7230±196	<12	<6.6	246±9.1	443±34
SA-ESS-16F1	11/20/2008	<112	8470±280	<8.1	<27	374±14	487±39
AVERAGE		-	6400±6000	-	-	400±490	560±500
GRAND AVERAGE		-	6500±7100	-	-	430±430	560±480

* All other gamma emitters searched for were <LLD; typical LLDs are given in Table C-18
(C) Control Station

TABLE C-18

2008 MAPLEWOOD TESTING SERVICES
LLDs FOR GAMMA SPECTROSCOPY

SAMPLE TYPE:	<----AIR----	---->	<----WATER----	---->	<----MILK----	---->
	IODINE	PARTICULATES	GAMMA SCAN	IODINE	GAMMA SCAN	IODINE
ACTIVITY:	10-3 pCi/m3	10-3 pCi/m3	pCi/L	pCi/L	pCi/L	pCi/L
GEOMETRY:	47 ML	13 FILTERS	3.5 LITERS	100 ML	3.5 LITERS	100 ML
COUNT TIME:	120 MINS	500 MINS	1000 MINS	1000 MINS	500 MINS	1000 MINS
DELAY TO COUNT:	2 DAYS	5 DAYS	7 DAYS	3 DAYS	2 DAYS	2 DAYS
NUCLIDES						
BE-7	-	2.0	12	-	18	-
NA-22	-	0.32	1.6	-	6.0	-
K-40	-	9	34	-	32	-
CR-51	-	1.6	11	-	20	-
MN-54	-	0.36	1.2	-	3.2	-
CO-58	-	0.31	2.2	-	2.9	-
FE-59	-	0.78	2.7	-	9.8	-
CO-60	-	0.28	2.6	-	5.9	-
ZN-65	-	0.54	3.6	-	17	-
ZRNB-95	-	0.54	3.2	-	3.9	-
MO-99	-	38	86	-	15	-
RU-103	-	0.30	1.2	-	1.6	-
RU-106	-	2.8	15	-	28	-
AG-110M	-	0.39	2.2	-	3.1	-
SB-125	-	0.86	2.8	-	4.8	-
TE-129M	-	12	60	-	87	-
I-131	8.5	0.68	2.9	0.33	3.1	0.33
TE-132	-	2.3	5	-	9.8	-
BA-133	-	0.24	1.2	-	1.9	-
CS-134	-	0.30	0.9	-	2.4	-
CS-136	-	0.36	3.2	-	2.1	-
CS-137	-	0.35	1.1	-	3.2	-
BALA-140	-	1.3	7.6	-	5.3	-
CE-141	-	0.20	3.0	-	3.2	-
CE-144	-	0.70	7.5	-	4.4	-
RA-NAT	-	1.10	6.6	-	5.1	-
TH-232	-	1.2	10.0	-	14	-

TABLE C-18 (Cont'd)

2008 MAPLEWOOD TESTING SERVICES LLDs FOR GAMMA SPECTROSCOPY

SAMPLE TYPE:	FOOD PRODUCTS GAMMA SCAN	VEGETATION GAMMA SCAN	FISH & CRAB GAMMA SCAN	SEDIMENT GAMMA SCAN
ACTIVITY:	pCi/kg WET	pCi/kg WET	pCi/kg WET	pCi/kg DRY
GEOMETRY:	500 ml	3.5 LITER	500 ml	500 ml
COUNT TIME:	500 MINS	500 MINS	500 MINS	500 MINS
DELAY TO COUNT:	3 DAYS	7 DAYS	5 DAYS	30 DAYS
NUCLIDES				
BE-7	92	75	75	128
NA-22	8.9	18	9.9	24
K-40	70	32	55	55
CR-51	55	25	74	99
MN-54	10	10	4.7	14
CO-58	5.6	7.5	6.6	7.8
FE-59	20	16	14	24
CO-60	22	16	15	29
ZN-65	20	25	13	19
ZRNB-95	18	6.8	10	34
MO-99	251	227	206	90500
RU-103	6.5	4.2	6.7	14
RU-106	65	36	38	68
AG-110M	10	12	9	20
SB-125	18	8.1	14	24
TE-129M	328	210	229	575
I-131	7.9	6.3	104	80
TE-132	23	7.8	12	4030
BA-133	7.3	3.6	13.0	14.0
CS-134	6.4	3.7	3.8	7
CS-136	8.9	4.0	34	40
CS-137	24	5.8	12	27
BALA-140	30	23	97	139
CE-141	7.7	4.6	9.0	19
CE-144	32	18	18	40
RA-NAT	13	12	24	5.0
TH-232	73	39	44	8.1

APPENDIX D

SUMMARY OF RESULTS FROM ANALYTICS, ENVIRONMENTAL RESOURCE ASSOCIATES, AND AREVA E – LAB INTERLABORATORY COMPARISON PROGRAMS

APPENDIX D

SUMMARY OF RESULTS FOR ANALYTICS, ENVIRONMENTAL RESOURCE ASSOCIATES, AND AREVA E-LAB INTERLABORATORY COMPARISON PROGRAM

Appendix D presents a summary of the analytical results for the 2008 Analytics and Environmental Resource Associates (ERA) Interlaboratory Comparison Program plus the TLD QA Data for AREVA E-LAB.

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TABLE D-1

RESULTS FOR ANALYTICS ENVIRONMENTAL CROSS CHECK PROGRAM

Gross Alpha and Gross Beta Emitters In Water (pCi/L), Iodine In Air Samples (pCi/m^3), Gross Beta In Air Particulate Filter (pCi/m^3), And Tritium Analysis In Water (pCi/L)

Date MM-YY	MTS Sample Code	Sample Media	Nuclide	MTS Reported Value	Known Value	Resolution	Ratio MTS/ Analytics	Evaluation
03-2008	B683	APT	Beta	83.7	71	60	1.18	Acceptable
03-2008	H684	WAT	H-3	4078	4010	60	1.02	Acceptable
03-2008	I687	AIO	I-131	60.7	60	60	1.01	Acceptable
06-2008	B691	APT	Beta	41	42	60	0.98	Acceptable
06-2008	AB692	WAT	Alpha	158.5	194	60	0.82	Acceptable
			Beta	191.6	169	60	1.13	Acceptable
06-2008	I693	AIO	I-131	80.1	85	21	0.95	Acceptable
06-2008	H695	WAT	H-3	13084	13000	60	1.01	Acceptable
09-2008	I698	AIO	I-131	91.5	89	60	1.03	Acceptable
09-2008	H700	WAT	H-3	11161	11400	60	0.98	Acceptable
09-2008	AB701	WAT	Alpha	143	152	60	0.94	Acceptable
			Beta	169	134	60	1.26	Disagree
12-2008	AB706	WAT	Alpha	52	114	60	0.46	Disagree
			Beta	228	204	60	1.12	Acceptable
12-2008	I707	AIO	I-131	54	54	60	1.01	Acceptable
12-2008	H705	WAT	H-3	10194	10200	60	1.00	Acceptable
12-2008	B709	APT	Beta	127	119	60	1.07	Acceptable

TABLE D-2

RESULTS FOR ANALYTICS ENVIRONMENTAL CROSS CHECK PROGRAM

Gamma Emitters in Water And Milk (pCi/L)

Date MM-YY	MTS Sample Code	Sample Media	Nuclide	MTS Reported Value	Known Value	Resolution	Ratio MTS/ Analytics	Evaluation
03-2008	G685	WAT	Cr-51	290	286.0	60	1.01	Acceptable
			Mn-54	84.0	75.0	60	1.12	Acceptable
			Co-58	59	56	63	1.04	Acceptable
			Fe-59	88.0	81	60	1.08	Acceptable
			Co-60	190	188	60	1.01	Acceptable
			Zn-65	116	109	60	1.07	Acceptable
			I-131	71	70	60	1.00	Acceptable
			Cs-134	94	100	60	0.94	Acceptable
			Cs-137	121	116	60	1.04	Acceptable
			Ce-141	199	198	60	1.01	Acceptable
03-2008	G688	MILK	Cr-51	361.3	359	60	1.01	Acceptable
			Mn-54	103.3	94	60	1.10	Acceptable
			Co-58	72.4	71	60	1.02	Acceptable
			Fe-59	110.3	102	60	1.08	Acceptable
			Co-60	240.7	236	60	1.02	Acceptable
			Zn-65	146.7	137	60	1.07	Acceptable
			I-131	60.3	60	60	1.00	Acceptable
			Cs-134	117.3	125	60	0.94	Acceptable
			Cs-137	151.0	146	60	1.03	Acceptable
			Ce-141	249.3	249	60	1.00	Acceptable
12-2008	G708	WAT	Cr-51	303	288	60	1.05	Acceptable
			Mn-54	181	178	60	1.02	Acceptable
			Co-58	127	122	60	1.04	Acceptable
			Fe-59	124	117	60	1.06	Acceptable
			Co-60	160	156	60	1.02	Acceptable
			Zn-65	219	214	60	1.02	Acceptable
			I-131	64	64	60	0.99	Acceptable
			Cs-134	148	157	60	0.94	Acceptable
			Cs-137	138	140	60	0.99	Acceptable
			Ce-141	228	224	60	1.02	Acceptable

TABLE D-3

RESULTS FOR ANALYTICS ENVIRONMENTAL CROSS CHECK PROGRAM

Gamma Emitters in Soil (pCi/g-dry) And Air Particulate Samples (pCi/m^3)

Date MM-YY	MTS Sample Code	Sample Media	Nuclide	MTS Reported Value	Known Value	Resolution	Ratio MTS/ Analytics	Evaluation
03-2008	G686	Soil	Cr-51	0.509	0.517	60	.99	Acceptable
			Mn-54	0.154	0.136	60	1.13	Acceptable
			Co-58	0.107	0.102	60	1.05	Acceptable
			Fe-59	0.161	0.147	60	1.10	Acceptable
			Co-60	0.334	0.34	60	0.98	Acceptable
			Zn-65	0.199	0.197	60	1.01	Acceptable
			Cs-134	0.162	0.180	60	0.90	Acceptable
			Cs-137	0.307	0.321	60	1.05	Acceptable
			Ce-141	0.345	0.358	60	0.96	Acceptable
06-2008	G694	APT	Cr-51	185	145	60	1.27	Disagree
			Mn-54	184	142	60	1.30	Disagree
			Co-58	78	65	60	1.20	Acceptable
			Fe-59	125	96	60	1.30	Disagree
			Co-60	124	109	61	1.14	Acceptable
			Zn-65	164	133	60	1.23	Acceptable
			Cs-134	77	81	60	0.95	Acceptable
			Cs-137	148	122	60	1.22	Acceptable
			Ce-141	216	183	60	1.18	Acceptable
09-2008	G699	SOIL	Cr-51	0.821	0.833	60	0.99	Acceptable
			Mn-54	0.361	0.329	60	1.10	Acceptable
			Co-58	0.364	0.353	60	1.03	Acceptable
			Fe-59	0.304	0.286	60	1.06	Acceptable
			Co-60	0.453	0.464	60	0.98	Acceptable
			Zn-65	0.639	0.632	60	1.01	Acceptable
			Cs-134	0.424	0.459	60	0.92	Acceptable
			Cs-137	0.433	0.416	60	1.04	Acceptable
			Ce-141	0.324	0.319	64	1.02	Acceptable

TABLE D-4

RESULTS FOR ENVIRONMENTAL RESOURCE ASSOCIATES (ERA) PROFICIENCY TESTING PROGRAM

Gamma Emitters in Water (pCi/L), Gross Alpha and Beta in Water (pCi/L), Iodine-131 Analysis in Water (pCi/L), and Tritium in Water (pCi/L),

Date MM-YY	MTS Sample Code	Sample Media	Nuclide	MTS Reported Value	ERA Assigned Value	Acceptance Limits	Evaluation
01-2008	AB682	WAT	Alpha	13.9	14.8	7.15 – 21.2	Acceptable
			Beta	21.1	22.5	13.7 – 30.6	Acceptable
04-2008	H690	WAT	H-3	11946	12000	10400 – 13200	Acceptable
04-2008	I689	WAT	I-131	29.4	28.7	13.9-33.6	Acceptable
07-2008	G697	WAT	Ba-133	46.1	46.6	38.1-51.8	Acceptable
			Co-60	28.7	25.7	22.3-31	Acceptable
			Cs-134	88.3	93.2	75.6-102.0	Acceptable
			Cs-137	55.3	54.6	49.1-62.9	Acceptable
			Zn-65	106.7	98.8	88.8-118.0	Acceptable
7-2008	AB696	WAT	Alpha	19.8	30.7	15.7-40.0	Acceptable
			Beta	24.8	25.8	16.1-33.7	Acceptable
10-2008	AB703	WAT	Alpha	17.8	26.9	13.6-35.5	Acceptable
			Beta	32.8	38	25.1-45.5	Acceptable
12-2008	I702	WAT	I-131	30	28.1	23.4-33.0	Acceptable
12-2008	H704	WAT	H-3	2220.3	2220	1830-2460	Acceptable

TABLE D-5

PERCENTAGE OF INDIVIDUAL TLD RESULTS THAT PASSED AREVA E-LAB INTERNAL CRITERIA

Dosimeter Type	Number Tested	% Passed Bias Criteria	% Passed Precision Criteria
Panasonic Environmental TLDs	90	100	100

TABLE D-6

THIRD PARTY TLD TESTING PERFORMANCE CRITERIA

Dosimeter Type	Exposure Period	ANSI Category	% (Bias ± SD) *
Panasonic Environmental TLDs	FH 2008	II	2.7 +/- 1.0
Panasonic Environmental TLDs	SH 2008	II	-1.1 +/- 1.4

* Performance criteria are the same as the internal criteria.

APPENDIX E

SYNOPSIS OF LAND USE CENSUS

APPENDIX E

SYNOPSIS OF 2008 LAND USE CENSUS

A land use census was conducted 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 $50m^2$ ($500ft^2$) producing broad leaf vegetation. In accordance with Salem and Hope Creek ODCMs the census was performed using a door to door survey, visual survey and by consulting with local agriculture authorities.

Meteorological Sector	Milk Animal July, 2008 Km (miles)	Nearest Residence July, 2008 Km (miles)	Vegetable Garden July, 2008 Km (miles)
N	None	None	None
NNE	None	None	None
NE	None	6.4 (4.0)	7.8 (4.9)
ENE	None	5.2 (3.6)	None
E	None	None	None
ESE	None	None	None
SE	None	None	None
SSE	None	None	None
S	None	None	None
SSW	None	5.5 (3.4)	None
SW	None	6.9 (4.3)	7.1 (4.4)
WSW	None	7.1 (4.4)	7.1 (4.4)
W	7.8 (4.9)	6.5 (4.0)	None
WNW	None	5.5 (3.4)	None
NW	None	5.9 (3.7)	None
NNW	None	6.8 (4.2)	None

The 2008 Land Use Census results are summarized in the above table. A comparison of the identified locations from the 2008 table with the 2007 table shows that no new nearest milk animal, nearest resident, or nearest vegetable garden (500 Ft^2) with broadleaf vegetation were identified. Therefore, no formal dose evaluation or changes to the ODCMs are required.

APPENDIX F

RADIOLOGICAL GROUNDWATER PROTECTION PROGRAM
(RGPP)

2008 Radiological Groundwater Protection Program (RGPP)

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Figures

I. Introduction

This is the annual report on the status of the Radiological Groundwater Protection Program (RGPP) conducted at Salem and Hope Creek Generating Stations. This report covers the RGPP groundwater samples collected from the PSEG site in 2008. This report also describes any changes to this program and provides the radiochemical analysis results for groundwater samples collected during the 2008 reporting year. The 2006 PSEG Annual Radiological Environmental Operating Report (AREOR) was the first report that provided a description of the RGPP (PSEG, 2007). Both the 2006 and 2007 AREORs contained information and detailed descriptions of the RGPP in Appendix F. This report contains a summary of the previous annual report description and the results of the 2008 long-term groundwater-sampling program.

The RGPP was initiated by PSEG in 2006 to determine whether groundwater at and in the vicinity of Salem and Hope Creek Stations had been adversely impacted by any releases of radionuclides related to nuclear station operations. The RGPP is a voluntary program implemented by PSEG in conjunction with the nuclear industry initiatives and associated guidance (NEI, 2007). Although it is designed to be separate, the RGPP complements the existing Radiological Environmental Monitoring Program and Radioactive Effluent Technical Specification programs. The long-term groundwater-sampling program is one of the key elements of the RGPP that provides for early leak detection. The other key elements that comprise the RGPP and contribute to public safety are spill/leak prevention and effective remediation.

In 2002, operations personnel at Salem Generating Station identified a release of radioactive liquids from the Unit 1 Spent Fuel Pool to the environment. PSEG developed a Remedial Action Work Plan (RAWP). This RAWP was reviewed by the U.S. Nuclear Regulatory Commission (USNRC) and approved by the New Jersey Department of Environmental Protection - Bureau of Nuclear Engineering (NJDEP-BNE). In accordance with the RAWP, a Groundwater Recovery System (GRS) has been installed and is in operation to remove the groundwater containing tritium. This system was designed to reduce the migration of the tritium plume towards the plant boundary. The GRS is fully discussed in the quarterly Remedial Action Plan Reports (RAPR) provided to the state and the U.S. Nuclear Regulatory Commission by PSEG. The information and data associated with the GRS is not included in the annual RGPP reports. It should be noted that five shared monitoring wells (Well IDs AL, T, U, Y and Z) are included in both the GRS monitoring and RGPP long-term sampling programs to ensure that the two programs are comprehensive.

II. Groundwater Pathways

PSEG's Salem and Hope Creek Generating Stationss are located in a flat, largely undeveloped region of southern New Jersey. The Sites are bordered on the west and south by the Delaware River Estuary and on the east and north by extensive marshlands. Both of the sites obtain cooling water from the Delaware River Estuary and discharge it back to this Estuary.

The two sites are underlain by over 1,000 feet of inter-layered sand, silt and clay. The Salem and Hope Creek sites derive potable and sanitary water from deep wells in the Potomac-Raritan-Magothy (PRM) formations, greater than 600 feet below the surface.

There are no potable wells off-site within at least one mile. The nearest potable supply well is located 3.65 miles away in the state of Delaware. In the vicinity of the site there is no public water supply wells or private wells that can be impacted by radionuclides associated with nuclear station operations.

A. Objectives for the RGPP

The long-term sampling program objectives are as follows:

1. Identify suitable locations to monitor and evaluate potential impacts from

station operations before significant radiological impact to the environment or potential drinking water sources can occur.

2. Understand the local hydro-geologic regime in the vicinity of the station and maintain up-to-date knowledge of flow patterns on the surface and shallow subsurface.

3. Perform routine water sampling from strategic locations and evaluate radiochemical analysis results.

4. Report new leaks, spills, or other detections with potential radiological significance to stakeholders in a timely manner.

5. Regularly evaluate analytical results to identify adverse trends.

6. Take necessary corrective actions to protect groundwater resources.

III. Long-term Groundwater Sampling Program Description

A. Sample Collection

This section describes the general sampling methodologies used to collect water samples from monitoring wells for the Salem and Hope Creek Generating Stations RGPP. In 2006, the RGPP monitoring wells (Tables 1 and 2, Monitoring Well Construction Details) were installed and developed for both Salem and Hope Creek as part of the Site Tritium Investigation (ARCADIS, 2006A and 2006B). Groundwater samples were collected from all new monitoring wells, as well as the five pre-existing wells located at Salem (AL, T, U, Y & Z). Test Engineers and Laboratory Technicians from PSEG Maplewood Testing Services (MTS) collected these groundwater samples. Sampling protocols were consistent with U.S. Environmental Protection Agency (USEPA) and NJDEP guidance; a modified low-flow sampling methodology was used. This methodology is consistent with protocols established for the Salem GRS investigation. The initial groundwater sampling began approximately two weeks following the completion of well development activities.

In May 2006, after the Site Hydrological Investigation was completed the long-term groundwater-sampling program was initiated. The Hope Creek RGPP monitoring wells are currently sampled semi-annually (BL, BT, BO, BP, BR and BS) and quarterly (BH, BI, BJ, BK, BM, BN and BQ). The Salem RGPP monitoring wells are currently sampled semi-annually (BA, BB, BC, BD, BE, BF, BG and BU), quarterly (AL, T and U) and monthly (Y and Z). The sampling frequencies that are specified in the RGPP procedures may be modified by the PSEG RGPP Manager for purposes of adaptive management of the RGPP. However, sampling and analysis shall not occur less frequently than semi annually.

Two deviations occurred in the RGPP sampling program during 2008. The deviations were for Salem Well BC and Hope Creek Well BN. The Salem monitoring well BC, which is sampled semiannually, could not be sampled during the October 2008 sampling campaign due to a recent security modification. This modification prevented safe access to the well. This safety concern is being evaluated and the necessary corrective actions will be taken.

The Hope Creek Well BN which is required to be sampled quarterly was not collected during the second quarter. This well location was thought to have a semi-annual sampling frequency. A quarterly sampling frequency is appropriate for well BN because it's tritium concentrations are trending upward. Well BN will be sampled quarterly in 2009.

B. Sample Analysis

This section describes the general analytical methodologies used to analyze the water samples for radioactivity for the Salem and Hope Creek Generating Stations RGPP. Groundwater samples were analyzed for plant-related gamma emitting radionuclides (every sample), tritium (every sample) and total strontium (annually) by a radiochemical analytical laboratory. In order to achieve the stated RGPP objectives, the long-term groundwater-sampling program includes the following measurements and analyses:

- Concentrations of gamma emitting radionuclides in water by gamma spectroscopy.
- Concentrations of tritium in water by filtration/distillation and liquid scintillation.
- Concentrations of strontium in water by chemical separation and liquid scintillation.

The tritium analysis results reported in Tables 4A and 4B were obtained from PSEG MTS laboratory located in Maplewood, NJ. The gamma spectroscopy and total Sr analysis results are obtained from Teledyne Brown Engineering (TBE) Laboratory located in Knoxville, TN. Analytical laboratories are subject to internal quality assurance programs and inter-laboratory cross-check programs. The inter- laboratory cross-check program for the RGPP samples is conducted between the PSEG MTS laboratory and the TBE laboratory (tritium analysis only). Station personnel review and evaluate all analytical data deliverables obtained from these laboratories upon receipt.

C. Data Evaluation

This section describes the method used to evaluate the analytical results for RGPP samples obtained at the Salem and Hope Creek Generating Stations site. Analytical data results are reviewed for adverse trends or anomalous data. Investigations and notifications are made as required by RGPP program procedures. The radiological data for groundwater collected during the preoperational phase of the stations were used as a baseline with which current operational data were compared. Several factors are important in the interpretation and evaluation of the radiological data:

1. Lower Limit of Detection

The lower limit of detection (LLD) is specified by federal regulation as a minimum sensitivity value that must be achieved routinely by the analytical method. The environmental LLD specified in the Offsite Dose Calculation Manual (ODCM) for tritium is 3,000 pCi/L (ODCM Table 14.12-1 for Salem and Table 14.12.1-1 for Hope Creek). However, for the RGPP all tritium analyses are performed with the lower LLD of 200 pCi/L. All other nuclides Minimum Detectable Concentrations (MDCs) meet or are below the LLDs specified in the ODCM. For 2008 RGPP, the analytical sensitivities for all analysis met or were below the LLDs specified in the ODCMs.

2. Laboratory Measurements Uncertainty

Statistically, the exact value of a measurement is expressed as a range with a stated level of confidence. The convention is to report results with a 95% level of confidence. The uncertainty comes from the counting system measurement, calibration standards, sample volume or weight measurements, sampling uncertainty and other factors.

Analytical uncertainties are reported at the 95% confidence level in this RGPP report to be consistent with the uncertainties reported in the

AREOR for the RGPP.

3. Groundwater Data Quality Analysis

Groundwater samples generally consist of at least four aliquots. These split samples were either submitted to a laboratory or held as back up samples as described in the MTS sampling procedures.

One of the groundwater samples is submitted to the respective station's onsite chemistry laboratory for tritium and gamma spectroscopy analysis. If these scans indicated that tritium concentrations is below 10,000 pCi/L and no plant-related gamma emitters were present (all RGPP samples met this criteria), then the second sample is sent to the MTS Laboratory for tritium analysis. The on-site Chemistry laboratory's screening analysis for all 2008 RGPP groundwater samples were below 10,000 pCi/L for tritium and no plant-related gamma emitters were present above the associated LLDs specified in the ODCM.

The third split sample is submitted to the TBE Laboratory for tritium, gamma spectroscopy and total Sr analysis. During 2008, the tritium concentration results for those wells that had results above the minimum detectable concentrations were compared. The PSEG MTS and TBE tritium results on split samples were found to have a relative percent difference within ± 10%.

The forth split sample is held as a back-up samples until all the analytical results were received and determined to be valid. In the event that the results were believed to be questionable or sample results were lost, the back-up sample would be submitted for analysis. In addition, this back-up sample can be used to verify a samples analytical result when needed.

IV. Results and Discussion

The locations of the RGPP monitoring wells are illustrated on the aerial maps for Hope Creek and Salem in Figures 1 and 2, respectively. The Monitoring Well Construction Details for Hope Creek and Salem are provided in Tables 1 and 2, respectively. The relevant groundwater parameters used to evaluate the groundwater data are provided in Table 3 Relevant Groundwater Evaluation Criteria: Salem and Hope Creek Generating Stations. The Lower Limit of Detection (LLD) is defined as the smallest concentration of radioactive material in a sample that will yield a net count, above system background, that will be detected with 95% probability with only 5% probability of falsely concluding that a blank observation represents a "real" signal. The Reporting Level is the level of plant produced radioactive material in an environmental sampling medium (averaged over any calendar quarter) from a specified location that requires a 30-day written report to the U. S. Nuclear Regulatory Commission. The 2008 Groundwater Tritium Analytical Results for Hope Creek Generating Station are shown in Table 4A. The 2008 Groundwater Tritium Analytical Results for Salem Generating Station are shown in Table 4B. During 2008, none of the groundwater sample results exceeded the Reporting Levels in Table 3.

A. Groundwater Results

Samples were collected from RGPP monitoring wells during 2008 in accordance with the station and MTS procedures for the radiological groundwater protection program with the exception of Salem RGPP monitoring well BC and BN. Well BC was sampled once instead of semiannually due to a safety concern associated with a recent Security Modification. This safety concern is being evaluated and the safety hazard will be moved back to allow safe access. The Well BN was not sampled during the second quarter. This well location was thought to have a semi-annual sampling frequency. Well BN will be sampled quarterly in 2009.

The MTS Laboratory in Maplewood, NJ analyzed the groundwater samples for tritium. TBE Laboratory in Knoxville, TN analyzed the groundwater samples for plant-related tritium, gamma emitters and total strontium. Analytical results and anomalies, if any, are discussed below.

Tritium at Hope Creek Generating Station

The results of the laboratory analysis indicate that tritium was detected, i.e, reported at a concentration above the RGPP LLD of 200 pCi/L, in six RGPP monitoring wells. The tritium concentrations measured at wells BH, BI, BJ, BK, BM, and BN ranged from <200 pCi/L to 934 pCi/L during 2008.

Tritium was detected at well BH in the range of <200 pCi/L to 736 pCi/L. Well BH is located down gradient of the Condensate Storage Tank (CST) near the southwest protected area boundary and is a perimeter well. Tritium was detected at well BI in the range of 227 pCi/L to 678 pCi/L. Well BI is located due west of the reactor containment and is a sentinel well. Tritium was detected at well BJ in the range of <200 pCi/L to 934 pCi/L. Well BJ is also located down gradient of the CST and is a sentinel well. Tritium was detected at well BK in the range of <200 pCi/L to 798 pCi/L. Well BK is also located due west of the reactor containment and is a perimeter well. Tritium was detected at well BM in the range of <200 pCi/L to 258 pCi/L. Well BM is also located west of the Unit 2 Reactor Building and is a sentinel well. Tritium was detected at well BN in the range of 238 pCi/L to 423 pCi/L. Well BN is located northeast of the Material Control Center and is a sentinel well.

These low concentrations of tritium were evaluated and determined not to be indicative of an adverse trend as shown in Figure 3 - Hope Creek Tritium Trends: Wells BH, BI, BJ, BK, BM, BN. These wells are being sampled quarterly and the results will continue to be evaluated. These tritium concentrations are all well below the ODCM Reporting Limit of 30,000 pCi/L. Monitoring is underway for alternate sources considered to be a potential contributor to these anomalous results, such as analysis of the yard drainage systems, the service water system, the precipitation from the roof areas near the plant vents, and other similar potential sources.

Tritium at Salem Generating Station

The results of the laboratory analysis indicate that tritium was detected, i.e., reported at a concentration above the RGPP LLD of 200 pCi/L, in five RGPP monitoring wells. The tritium concentrations measured at wells AL, BD, BE, BG and Z ranged from <200 pCi/L to 659 pCi/L during 2008.

Tritium was detected at well AL in the range of 366 pCi/L to 426 pCi/L. Well AL is also located south of the Salem 1 containment and is a sentinel well. The tritium concentration in well BD ranged from 264 pCi/L to 323 pCi/L. Well BD was installed to monitor groundwater quality adjacent to and downgradient of the Refueling, Auxiliary, and Primary Water Storage tank area and is a sentinel well. Tritium was detected at well BE in the range of <200 pCi/L to 659 pCi/L. Well BE is also located due west of the Salem 2 containment and is a perimeter well. Tritium was detected at well BG in the range of <200 pCi/L to 322 pCi/L. Well BG is located northwest of the Salem 2 containment and is a perimeter well. Tritium was detected at well Z in the range of <200 pCi/L to 289 pCi/L. Well Z is also located due west of the Salem 1 Spent Fuel Pool and is a perimeter well.

These low concentrations of tritium were evaluated and determined not to be indicative of an adverse trend as shown in Figure 4 – Salem Tritium Trends: Wells AL, BD, BE, BG, Z. The concentration of tritium detected in these wells is well below the ODCM Reporting Limit of 30,000 pCi/L. The tritium concentrations in these wells are being monitored and trended. No adverse trends have been observed.

Gamma Emitters

No plant-related gamma emitters were detected in any RGPP well sampled in 2008. Naturally occurring Potassium-40 was detected in several of the wells sampled during 2008.

Strontium

Total strontium, including Sr-89 and Sr-90, was not detected in any RGPP well sampled during 2008.

B. Investigations

An elevated tritium concentration was measured in the water from the Unit 2 Turbine Building Emergency Sump at Hope Creek Station. This resulted in a Tritium Investigation being conducted during the last quarter of 2008.

On November 7, 2008, as part of a station evaluation for an increase in plant water usage, water in the Unit 2 Emergency Sump was sampled. The results identified a tritium concentration of 40,990 pCi/L in the water from the Unit 2 Emergency Sump. One of the purposes for this sump is to collect the condensation from the Unit 2 Turbine Building HVAC. It was determined that this sump had been drained on or about November 3, 2008 and released through cooling tower blowdown to the Delaware River. Operations Department personnel were notified immediately. Equipment Operators tagged out the sump preventing any more inadvertent discharges.

A calculation was performed to determine the potential concentration of tritium that could have been released to the Delaware River. This calculation was based on the maximum tritium concentration and volume of water found in the Unit 2 Emergency Sump. Based on this calculation, which included the dilution associated with the water in the blowdown line, the amount released is greater than an order of magnitude below the reportable concentration listed in the ODCM.

A Prompt Investigation was initiated and a team was formed. The team's charter was to investigate and determine the source (s) of Tritium to the sump. This team worked independent but not exclusive from the Demineralized Water Usage Team mentioned previously.

The team evaluated eleven failure modes for the source of the Tritium in the Unit 2 Emergency Sump. Of the eleven failure modes identified, four were determined by the team to be the greatest potential sources of Tritium. In addition, the team performed a review of P&IDs drawings and visually inspected all potential sources to the sump. No anomalous inputs to the sump were identified.

Chemistry personnel obtained additional water samples from the 1C Lift Station, Low Volume Oily Waste, and the Cooling Tower blowdown. Results were less than LLD for all samples. This is consistent with historical analysis results of tritium concentration in these systems.

The Tritium Investigation team validated all open failure modes and concluded that the most probable source for the tritium is the recycling of monitored gaseous effluents from the offgas stack through the normal Turbine Building HVAC System condensate drains. Tritium concentrations are monitored prior to all future pump-outs of this sump. If sump concentrations are in excess of 3000 pCi/L the sump contents will be processed through the Liquid Radwaste System. The investigation found no indication of a release to groundwater from this sump.

C. RGPP 2008 Status

The RGPP long-term sampling program will be modified as required in 2009 to effect changes as a result of the recent tritium concentrations and to adaptively manage the program to meet the RGPP objectives. Baseline sampling and analysis of groundwater will continue on the following schedule:

- Tritium will be analyzed at least twice each calendar year to an LLD of 200 pCi/L;
- Plant-related gamma emitters will be analyzed semi-annually to the Environmental LLDs specified in the ODCM; and,
- Strontium will be analyzed annually as total strontium; if the total strontium is greater than 2.0 pCi/L strontium-89 and strontium-90 analysis will be performed.

RGPP monitoring well sample frequency will be adjusted based on analytical results, but in no event less than twice per year. In addition, several locations will undergo an investigation into the fluctuating tritium concentrations.

During October through December of 2008 PSEG Chemistry Department personnel conducted a self assessment of the RGPP. The assessment was performed to identify areas of the program that meets the intent of Nuclear Energy Institute NEI 07-07, "Industry Groundwater Protection Initiative - Final Guidance Document," August 2007 (NEI, 2007). This self-assessment identified program strengths, opportunities for performance improvement, and program deficiencies, and provided recommendations. These recommendations are currently being implemented. It is expected that completion of these recommended actions will improve RGPP conformance with the NEI-07-07 Objectives for the Industry Ground Water Protection Initiative (GPI). This in turn would strengthen the RGPP implementation and contribute to overall program excellence.

D. Impacts to Groundwater: Past Spills and Leaks

Historical unplanned and unmonitored releases on site are listed in Table 5, Salem and Hope Creek 10CFR50.75(g) Data. There are currently no known active releases into the groundwater at Salem or Hope Creek Stations.

In conclusion, the operation of Salem and Hope Creek Stations has had no adverse radiological impact on the environment from unmonitored or unplanned releases of radionuclides to groundwater.

V. References

1. ARCADIS, 2006A. Site Investigation Report July 2006. PSEG Nuclear LLC. Hope Creek Generating Station, Hancock's Bridge, New Jersey.
2. ARCADIS, 2006B. Site Investigation Report July 2006. PSEG Nuclear LLC. Salem Generating Station, Hancock's Bridge, New Jersey.
3. NEI, 2007, NEI 07-07, Industry Groundwater Protection Initiative – Final Guidance Document, Nuclear Energy Institute, Washington, DC, June 2007.
4. PSEG, 2007. 2006 Annual Radiological Environmental Operating Report, January 1 to December 31, 2006, Salem Generating Station Unit 1 and 2 and Hope Creek Generating Station, April 2007.
5. PSEG, 2008. 2007 Annual Radiological Environmental Operating Report, January 1 to December 31, 2007, Salem Generating Station Unit 1 and 2 and Hope Creek Generating Station, April 2008.
6. Reference for the 2008 Tritium Investigation Unit 2 Turbine Bldg Sump (Later)

Table 1 Hope Creek RGPP Monitoring Wells: Construction Details

Well ID	Installation Date	Construction Details	Diameter (inches)	Total Depth (feet bgs)	Monitoring Interval (feet bgs)	MP Elevation (feet RPD)	MP Elevation (feet msl)	Monitoring Purpose	Source Targets
Well BH	May-06	Sch-40 PVC	4	37.0	27 - 37	97.92	8	Perimeter	NA
Well BI	May-06	Sch-40 PVC	4	38.5	28.5 - 38.5	99.6	9.68	Source	Facilities; Piping
Well BJ	May-06	Sch-40 PVC	4	38.0	28 - 38	100.23	10.31	Source	Condensate Storage & Transfer; Facilities; Piping
Well BK	May-06	Sch-40 PVC	4	38.5	28.5 - 38.5	98.19	8.27	Perimeter	NA
Well BL	May-06	Sch-40 PVC	4	35.0	25 - 35	99.71	9.79	Perimeter	NA
Well BM	May-06	Sch-40 PVC	4	38.0	28 - 38	99.76	9.84	Source	Facilities; Piping
Well BN	May-06	Sch-40 PVC	4	12.5	7.5 - 12.5	102.64	12.72	Source	Auxiliary Boiler Building; Piping
Well BO	May-06	Sch-40 PVC	4	36.0	26 - 36	97.98	8.06	Perimeter/Source	Building Sewage
Well BP	May-06	Sch-40 PVC	4	38.0	28 - 38	99.06	9.14	Perimeter/Source	Building Sewage
Well BQ	May-06	Sch-40 PVC	4	42.0	32 - 42	102.16	12.24	Source	Auxiliary Boiler Building; Dry Cask Storage Building; Piping
Well BR	May-06	Sch-40 PVC	4	40.5	30.5 - 40.5	104.28	14.36	Perimeter/Source	Piping; Dry Cask Storage Building
Well BS	May-06	Sch-40 PVC	4	35.0	25 - 35	100.55	10.63	Upgradient	NA
Well BT	May-06	Sch-40 PVC	4	38.5	28.5 - 38.5	99.60	9.68	Upgradient	NA

Notes:

MP	Measuring Point
bgs	Below ground surface
RPD	Relative to plant datum
msl	Relative to mean sea level (NAVD 1988)
NA	Not applicable
NAD 83	North American Datum 1983

Table 2. Salem RGPP Monitoring Wells: Construction Details

Well ID	Installation Date	Construction Details	Diameter (inches)	Total Depth (feet bgs)	Monitoring Interval (feet bgs)	MP Elevation (feet RPD)	MP Elevation (feet msl)	Monitoring Purpose	Source Targets
Well T	Jun-03	Sch-40 PVC	2	31.2	21.2 - 31.2	104.13	14.21	Source	Facilities; House Heating Blr
Well U	May-03	Sch-40 PVC	2	32.2	27.2 - 32.2	98.57	8.65	Source	Facilities; House Heating Blr
Well Y	Sep-03	Sch-40 PVC	2	37.0	27.0 - 35.0	101.81	11.89	Perimeter	NA
Well Z	Sep-03	Sch-40 PVC	2	37.5	27.5 - 37.5	101.86	11.94	Perimeter	NA
Well AL	Jan-04	Sch-40 PVC	2	25.3	15.3 - 25.3	99.13	9.21	Perimeter	NA
Well BA	May-06	Sch-40 PVC	4	39.5	29.5 - 39.5	101.07	11.15	Perimeter	NA
Well BB	May-06	Sch-40 PVC	4	47.0	37 - 47	99.38	9.46	Perimeter	NA
Well BC	May-06	Sch-40 PVC	4	38.0	28 - 38	98.78	8.86	Source / Perimeter	Facilities; RAP Tanks; Piping
Well BD	May-06	Sch-40 PVC	4	40.5	30.5 - 40.5	98.78	8.86	Source	Facilities; RAP Tanks; Piping
Well BE	May-06	Sch-40 PVC	4	37.0	27 - 37	98.31	8.39	Perimeter	NA
Well BF	May-06	Sch-40 PVC	4	42.5	32.5 - 42.5	99.11	9.19	Perimeter	NA
Well BG	May-06	Sch-40 PVC	4	37.0	27 - 37	100	10.08	Perimeter	NA
Well BU	May-06	Sch-40 PVC	4	36.0	26 - 36	100.16	10.24	Upgradient	NA

Notes:

MP	Measuring Point
bgs	Below ground surface
RPD	Relative to plant datum
msl	Relative to mean sea level (NAVD 1988)
NA	Not applicable
NAD 83	North American Datum 1983

Table 3. Relevant Groundwater Evaluation Criteria: Salem and Hope Creek Generating Stations

Isotope	RGPP LLD (pCi/L)	PSEG ODCM Reporting Level (pCi/L)
Tritium Conc. (pCi/L)	200	30,000
Total Strontium (pCi/L)	2.0	8
Mn-54	15	1000
Fe-59	30	400
Co-60	15	300
Zn-65	30	300
Nb-95	15	400
Zr-95	15	200
Cs-134	15	30
Cs-137	18	50
Ba-140	60	200
La-140	15	200

* Informal Report, ODCM Reporting Limit 30,000 pCi/L

Table 4A. Analytical Results for Tritium in Groundwater:
Hope Creek Generating Station

Well ID	Sample Data	Tritium Conc. (pCi/L)	Well ID	Sample Data	Tritium Conc. (pCi/L)
BH	03/19/2008	**736**	BM	03/24/2008	<200
	06/12/2008	<200		06/12/2008	<200
	09/23/2008	<200		09/23/2008	**258**
	11/11/2008	<200		11/11/2008	<200
	12/18/2008	<200		12/18/2008	<200
BI	03/24/2008	**577**	BN	03/24/2008	**319**
	06/12/2008	**241**		06/12/2008	NS
	09/23/2008	**227**		09/15/2008	**372**
	11/11/2008	**592**		11/12/2008	**238**
	12/18/2008	**678**		12/30/2008	**423**
BJ	03/19/2008	<200	BO	04/16/2008	<200
	06/12/2008	<200		10/27/2008	<200
	09/23/2008	**934**			
	11/11/2008	200	BP	04/16/2008	<200
	12/18/2008	<200		10/27/2008	<200
BK	03/19/2008	**611**	BQ	03/24/2008	<200
	06/12/2008	<200		09/15/2008	<200
	09/23/2008	<200		11/12/2008	<200
	11/11/2008	**798**		12/30/2008	<200
	12/18/2008	<200			
BL	04/22/2008	<200	BR	4/16/2008	<200
	10/30/2008	<200		10/27/2008	<200
BT	04/16/2008	<200	BS	04/16/2008	<200
	10/27/2008	<200		10/27/2008	<200

Bold concentration value indicates tritium level above RGPP Administrative Limits 200 pCi/L.
NS Not Sampled

Table 4B Analytical Results for Tritium in Groundwater: Salem Generating Station

Well ID	Sample Date	Tritium Conc. (pCi/L)
AL	01/23/2008	**366**
AL	04/22/2008	**375**
AL	07/16/2008	**426**
AL	10/20/2008	**396**
BA	04/17/2008	<200
BA	10/20/2008	<200
BB	04/17/2008	<200
BB	10/20/2008	<200
BC	04/17/2008	<200
BC	10/21/2008	NS
BD	04/22/2008	**323**
BD	10/20/2008	**264**
BE	04/17/2008	<200
BE	10/21/2008	**659**
BF	04/17/2008	<200
BF	10/21/2008	<200
BG	04/22/2008	**322**
BG	10/21/2008	<200
BU	04/16/2008	<200
BU	10/27/2008	<200
T	01/16/2008	<200
T	04/22/2008	<200
T	07/16/2008	<200
T	10/21/2008	<200

Well ID	Sample Date	Tritium Conc. (pCi/L)
U	01/16/2008	<200
U	05/28/2008	<200
U	07/16/2008	<200
U	10/20/2008	<200
Y	03/13/2008	<200
Y	04/22/2008	<200
Y	05/15/2008	<200
Y	06/24/2008	<200
Y	07/17/2008	<200
Y	08/19/2008	<200
Y	09/03/2008	<200
Y	10/18/2008	<200
Y	11/21/2008	<200
Y	12/23/2008	<200
Z	03/13/2008	<200
Z	04/22/2008	<200
Z	05/15/2008	<200
Z	06/24/2008	<200
Z	07/17/2008	<200
Z	08/19/2008	<200
Z	09/03/2008	<200
Z	10/18/2008	**278**
Z	11/21/2008	**289**
Z	12/23/2008	**253**

Bold concentration value above RGPP Administrative Reporting Level 200 pCi/L.
NS Not Sampled

Table 5. Salem and Hope Creek 10CFR 50.75(g) Data

Spill/Discharge	Quantity(ies) Spilled / Discharged	Location of Spill/Discharge	Description
Apr-95	~ 88 mCi	Hope Creek and Salem	Steam from the Decon Solution Evaporator released from Hope Creek's South Plant Vent
Jun-01	~5Ci	Unit 1 RWST	Salem Unit 1 RWST Nozzle Leak
Sep-02	~5 Ci	Ground west of Unit 1 Spent Fuel Building	Blockage of the Spent Fuel Pool liner's "tell-tales" caused backup of contaminated water through building seams
Jan-05	No discharge to the environment	Hope Creek rooms 3133, 3135, 3129 and 5102	Water from inside the Waste Sludge Phase Separator Tank Room appeared to be leaking through the crack in the wall
May-07	2.8 milli Curies of Cs 137	In front of Salem Unit 2 condensate polisher	Burst site glass during operation. Resin blown through wall into switchyard

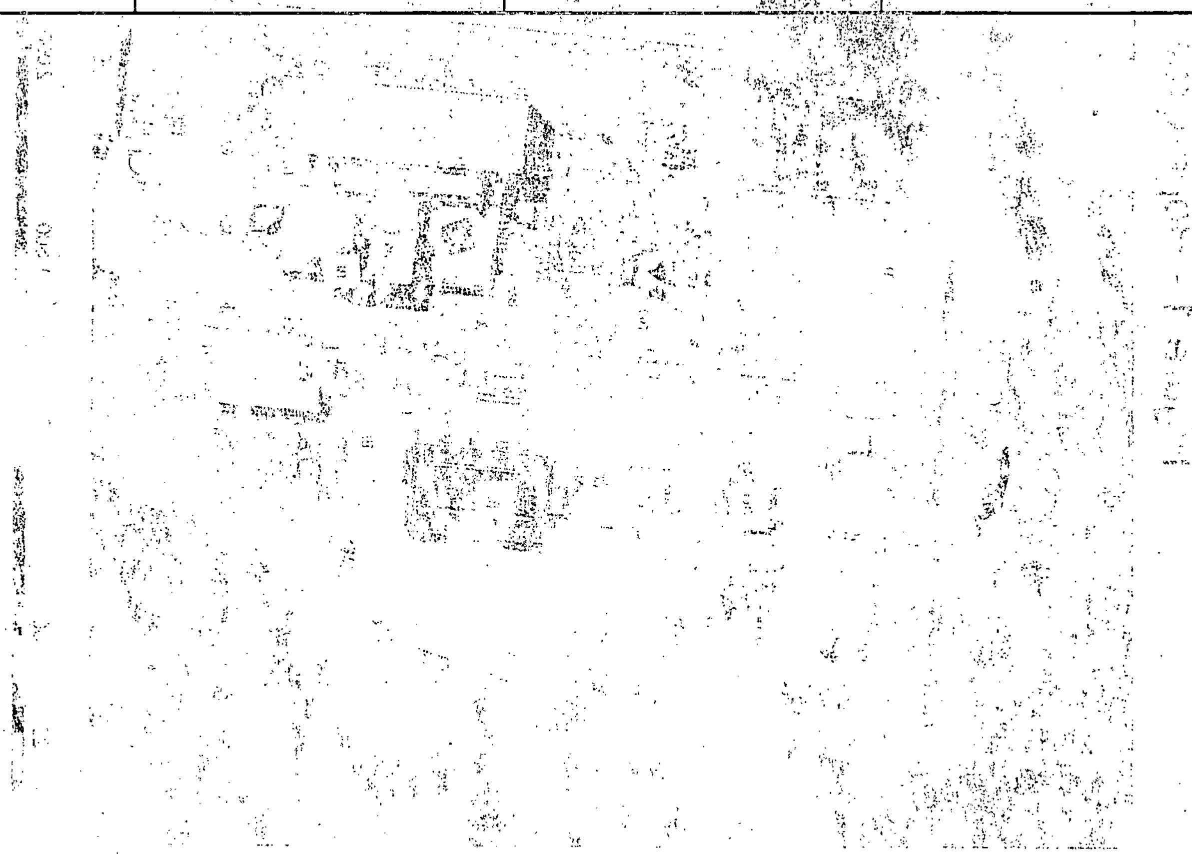

Figure 1 - Hope-Creek RGPP Monitoring Well Locations

BARTLETT

Figure 2 - Salem RGPP Monitoring Well Locations

BARTLETT

Figure 3 Hope Creek Tritium Trends: Wells BH, BI, BJ, BK, BM, BN

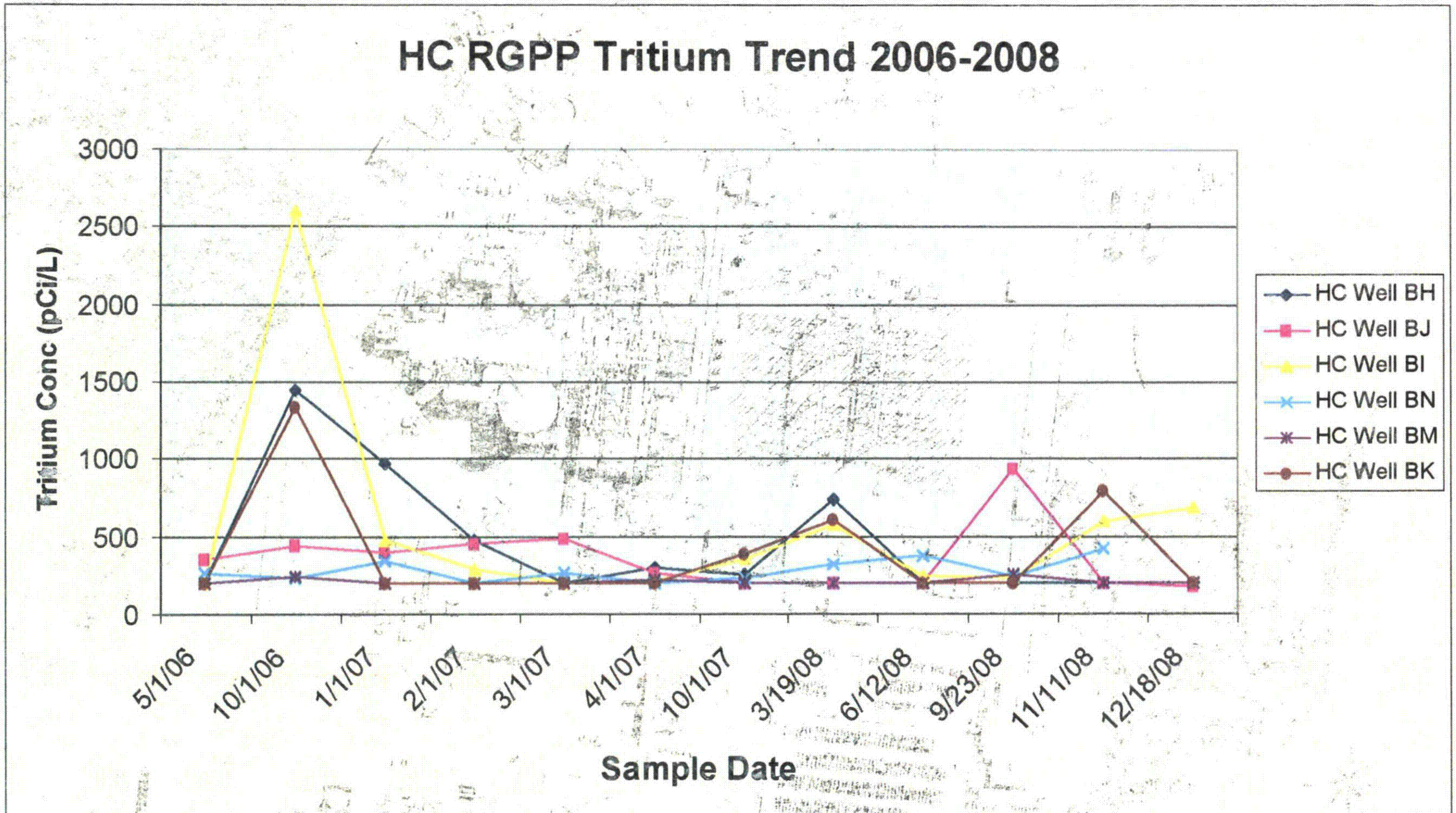

Figure 4 Salem Tritium Trends: Wells AL,BD, BE, BG, Z