VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

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United States Nuclear Regulatory Commission
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**VIRGINIA ELECTRIC AND POWER COMPANY (DOMINION)**
**NORTH ANNA POWER STATION UNIT NOS. 1 AND 2**
**INDEPENDENT SPENT FUEL STORAGE INSTALLATION (ISFSI)**
**ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT**

In accordance with North Anna Units 1 and 2 Technical Specification 5.6.2 and the North Anna Independent Spent Fuel Storage Installation Technical Specification 5.5.2b, enclosed is the 2010 Annual Radiological Environmental Operating Report. The Radiological Environmental Operating Report provides the details associated with the Radiological Environmental Monitoring Program.

If you have any questions or require additional information, please contact D. R. Taylor at (540) 894-2616.

Very truly yours,

N. Larry Lane
Site Vice President

Enclosure

Commitments made in this letter: None

IE25
NMSS26

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Director, Nuclear Material Safety and Safeguards
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

NRC Senior Resident Inspector
North Anna Power Station

*Dominion*

*North Anna Power Station*

*Radiological Environmental Monitoring Program*

*January 1, 2010 to December 31, 2010*

*Prepared by*

**Dominion, North Anna Power Station**

*Annual Radiological Environmental Operating Report*

*North Anna Power Station*

*January 1, 2010 to December 31, 2010*

*Prepared by:* Leonard E. Oakes

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# *Table of Contents*

# 1. EXECUTIVE SUMMARY

This document is a detailed report of the 2010 North Anna Nuclear Power Station Radiological Environmental Monitoring Program (REMP). It is submitted in accordance with North Anna Unit 1 and 2 Technical Specification 5.6.2 and North Anna Independent Spent Fuel Storage Installation (ISFSI) Technical Specification 5.5.2b. Radioactivity levels from January 1 through December 31, 2010, in water, silt, shoreline sediment, milk, aquatic biota, food products, vegetation, and direct exposure pathways have been analyzed, evaluated and summarized. The REMP is designed to confirm that radiological effluent releases are As Low As is Reasonably Achievable (ALARA), no undue environmental effects occur and the health and safety of the public are protected. The program also detects any unexpected environmental processes that could allow radiation accumulations in the environment or food pathway chains.

Radiation and radioactivity in the environment is monitored within a 25-mile radius of the station. North Anna Power Station personnel collect a variety of samples within this area. A number of sampling locations for each medium are selected using available meteorological, land use, and water use data. Two types of samples are obtained. Control samples are collected from areas that are beyond the measurable influence of North Anna Power Station or any other nuclear facility. These samples are used as reference data. Normal background radiation levels, or radiation present due to causes other than North Anna Power Station, can be compared to the environment surrounding the station. Indicator samples are the second sample type obtained. These samples show how much radiation is contributed to the environment by the station. Indicator samples are taken from areas close to the station where any station contribution will be at the highest concentration.

Prior to station operation, samples were collected and analyzed to determine the amount of radioactivity present in the area. The resulting values are used as a "pre-operational baseline." Analysis results from the indicator samples are compared to both current control sample values and the pre-operational baseline to determine if changes in radioactivity levels are attributable to station operations, or causes such as the Chernobyl accident or natural variation.

Global Dosimetry Solutions provided thermoluminescent dosimetry (TLD) services and Teledyne Brown Engineering Environmental Services provided radioanalytical services. Participation in an Interlaboratory Comparison Program provides an independent check of sample measurement precision and accuracy. Typically, radioactivity levels in the environment are so low that analysis values frequently fall below the minimum detection limits of state-of-the-art measurement methods. Because of this, the Nuclear Regulatory Commission (NRC) requires that

equipment used for radiological environmental monitoring must be able to detect specified minimum Lower Limits of Detection (LLDs). This ensures that analyses are as accurate as possible. The NRC also mandates a reporting level for certain radionuclides. Licensed nuclear facilities must report the radionuclide activities in those environmental samples that are equal to or greater than the specified reporting level. Environmental radiation levels are sometimes referred to as a percent of the reporting level.

Analytical results are reported for all possible radiation exposure pathways to man. These pathways include airborne, water, aquatic, terrestrial, and direct radiation exposure. The airborne exposure pathway includes radioactive airborne iodine and particulates, and precipitation. The 2010 airborne results were similar to previous years. Fallout or natural radioactivity levels remained at levels consistent with past years' results.

Water and aquatic exposure pathway samples include surface, river and well water, silt and shoreline sediments, and fish. The average tritium activity in surface water for 2010 was 3100 pCi/liter. River water collected from the North Anna River, 5.8 miles downstream of the site had an average tritium level of 3510 pCi/liter. Nb-95 was reported in one surface water sample at the indicator location. However, the peak was not identified, but forced activity concentration calculation exceeded MDC and the 2 sigma error. This is considered a false positive. No plant related isotopes were reported in any other surface or river water. Well water samples did not indicate the presence of plant related isotopes. No plant related isotopes were detected in precipitation samples. This trend is consistent throughout the environmental operational monitoring program. Silt samples indicated the presence of naturally occurring potassium-40 and thorium and uranium decay daughters at levels consistent with the natural background. Cs-137 was detected in two samples in the first half of the year. These samples were from one indicator and one control location. The levels were 100 and 155 pCi/kg respectively. This has occurred in the past and is attributed to fallout. This is likely in this instance also as the control location value is larger than the sample location value. During the second half of the year, Cs-134 was detected in one sample location, the control location, at 176 pCi/kg. However, this is considered a false positive as its peak was not detected during the analysis, but its forced activity concentration exceeded MDC and the 2 sigma error. Shoreline soil, which may provide a direct exposure pathway, indicated the presence of potassium-40 and thorium and uranium decay daughters also at levels consistent with natural levels. No plant related isotopes were detected in shoreline soil. Soil samples, which are collected every three years from twelve stations, were collected in 2010. Cs-137 was identified in several samples. For the indicator stations the average was 283 pCi/Kg while for the control station the average was 223 pCi/Kg. During the preoperational phase Cs-137 was routinely detected and was

attributed to fallout. Levels during this phase varied by location and date and ranged from 88 to 1390 pCi/Kg. The average was 645 pCi/kg. The current levels are also varied significantly by location and date. The decrease in the average, and the fact that the averages for the control location and the indicator locations are similar is indicative of fallout. Cs-134 was detected in three samples, but these are considered false positives since the peak was not identified during the analysis, but the force activity calculation resulted in an activity concentration that exceeded the $2\sigma$ value and the MDC. No other plant related isotopes were detected. Naturally occurring nuclides such as Be-7, K-40, Ra-226, Th-228, Th-232 and others were detected.

The terrestrial exposure pathway includes milk and food/vegetation products. Iodine-131 was not detected in any 2010 milk samples and has not been detected in milk prior to or since the 1986 Chernobyl accident. No plant related radioisotopes were detected in any milk samples. Naturally occurring beryllium-7, potassium-40 and radionuclides associated with the uranium and thorium series were detected at environmental levels consistent with historical data. No plant related isotopes were detected in any vegetation samples. Low levels of Cs-137 have been detected intermittently in past years. The direct exposure pathway measures environmental radiation doses by use of thermoluminescent dosimeters (TLDs). TLD results have remained essentially constant over the years.

During 2010, as in previous years, operation of the North Anna Power Station and the Independent Spent Fuel Storage Installation (ISFSI) created no adverse environmental effects or health hazards. The maximum total body dose calculated for a hypothetical individual at the station site boundary due to liquid and gaseous effluents released from the station during 2010 was 0.45 millirem. For reference, this dose may be compared to the 625 millirem average annual exposure to every person in the United States from natural and man-made sources. Natural sources in the environment provide approximately 82% of radiation exposure to man, while nuclear power contributes less than 0.1%. These results demonstrate not only compliance with federal and state regulations but also demonstrate the adequacy of radioactive effluent control at North Anna Power Station.

# 2. PROGRAM DESCRIPTION

## *2.1 Introduction*

This report documents the 2010 North Anna Power Station operational Radiological Environmental Monitoring Program (REMP).

The North Anna Power Station of Dominion Virginia Power Company is located on Lake Anna in Mineral, Virginia, approximately 35 miles southwest of Fredericksburg, Virginia. The site consists of two units, each with a pressurized water reactor (PWR) nuclear steam supply system and turbine generator furnished by Westinghouse Electric Corporation. Each unit was designed with a gross electrical output of 979 megawatts electric (MWe). Unit 1 achieved commercial operation on June 6, 1978 and Unit 2 on December 14, 1980. An independent spent fuel storage facility was licensed for dry cask storage of spent fuel in 1998.

The United States Nuclear Regulatory Commission (USNRC) regulations require that nuclear power plants be designed, constructed, and operated to keep levels of radioactive material in effluents to unrestricted areas as low as is reasonably achievable (ALARA). To ensure these criteria are met, the operating license for North Anna Power Station includes Technical Specifications, which address the release of radioactive effluents. In-plant monitoring is used to ensure release limits are not exceeded. As a precaution against unexpected or undefined environmental processes which might allow undue accumulation of radioactivity in the environment, a program for monitoring the plant environs is also included in North Anna Power Station Offsite Dose Calculation Manual (ODCM).

North Anna Power Station is responsible for collecting the various indicator and control environmental samples. Global Dosimetry Solutions is responsible for processing the TLDs. Teledyne Brown Engineering Environmental Services (TBE) is responsible for sample analyses. The results of the analyses are used to determine if changes in radioactivity levels may be attributable to station operations. Measured values are compared with control levels, which vary with time due to external events, such as cosmic ray bombardment, nuclear weapons test fallout and seasonal variations of naturally occurring radioisotopes. Data collected prior to station operation is used to indicate the degree of natural variation to be expected. This pre-operational data is compared with data collected during the operational phase to assist in evaluating any radiological impact of station operation.

Occasional samples of environment media show the presence of man-made isotopes. As a method of referencing the measured radionuclide concentrations in the sample media to a dose consequence to man, the data is compared to the

reporting level concentrations listed in the USNRC Regulatory Guide 4.8 and North Anna's ODCM. These concentrations are based upon the annual dose commitment recommended by 10CFR50, Appendix I, to meet the criterion of "As Low As Is Reasonably Achievable".

This report documents the results of the Radiological Environmental Monitoring Program for 2010 and satisfies the following objectives of the program:

- To provide measurements of radiation and of radioactive materials in those exposure pathways and for those radionuclides that lead to the highest potential radiation exposure of the maximum exposed member of the public resulting from station operations.

- To supplement the radiological effluent monitoring program by verifying that radioactive effluents are within allowable limits.

- To identify changes in radioactivity in the environment.

- To verify that station operations have no detrimental effect on the health and safety of the public.

## *2.2 Sampling and Analysis Program*

Table 2-1 summarizes the 2010 sampling program for North Anna Power Station. All samples listed in Table 2-1 are taken at indicator locations except those labeled "control." The North Anna Radiological Monitoring Locations maps denote sample locations for North Anna Power Station. The locations are color coded to designate sample types. Table 2-2 summarizes the analysis program conducted by TBE for North Anna Power Station during the year 2010.

# TABLE 2-1

North Anna Power Station – 2010

RADIOLOGICAL SAMPLING STATION

DISTANCE AND DIRECTION FROM UNIT NO. 1

| Sample Media | Location | Station | Distance | Direction | Degrees | Collection Frequency | Remarks |
|---|---|---|---|---|---|---|---|
| **Environmental** | NAPS Sewage Treatment Plant | 01 | 0.20 | NE | 42° | Quarterly & Annually | |
| **Thermoluminescent** | Fredericks Hall | 02 | 5.30 | SSW | 203° | Quarterly & Annually | |
| **Dosimetry (TLD)** | Mineral, Va | 03 | 7.10 | WSW | 243° | Quarterly & Annually | |
| | Wares Crossroads | 04 | 5.10 | WNW | 287° | Quarterly & Annually | |
| | Route 752 | 05 | 4.20 | NNE | 20° | Quarterly & Annually | |
| | Sturgeon's Creek Marina | 05A | 2.04 | N | 11° | Quarterly & Annually | |
| | Levy, VA | 06 | 4.70 | ESE | 115° | Quarterly & Annually | |
| | Bumpass, VA | 07 | 7.30 | SSE | 167° | Quarterly & Annually | |
| | End of Route 685 | 21 | 1.00 | WNW | 301° | Quarterly & Annually | |
| | Route 700 | 22 | 1.00 | WSW | 242° | Quarterly & Annually | |
| | "Aspen Hills" | 23 | 0.93 | SSE | 158° | Quarterly & Annually | |
| | Orange, VA | 24 | 22.00 | NW | 325° | Quarterly & Annually | Control |
| | Bearing Cooling Tower | N-1/33 | 0.06 | N | 10° | Quarterly | |
| | Sturgeon's Creek Marina | N-2/34 | 2.04 | N | 11° | Quarterly | |
| | Parking Lot "C" (on-site) | NNE-3/35 | 0.24 | NNE | 32° | Quarterly | |
| | Good Hope Church | NNE-4/36 | 3.77 | NNE | 25° | Quarterly | |
| | Parking Lot "B" | NE-5/37 | 0.20 | NE | 42° | Quarterly | |
| | Lake Anna Marina (Bogg's Dr) | NE-6/38 | 1.46 | NE | 34° | Quarterly | |
| | Weather Tower Fence | ENE-7/39 | 0.36 | ENE | 74° | Quarterly | |
| | Route 689 | ENE-8/40 | 2.43 | ENE | 65° | Quarterly | |
| | Near Training Facility | E-9/41 | 0.30 | E | 91° | Quarterly | |
| | "Morning Glory Hill" | E-10/42 | 2.85 | E | 93° | Quarterly | |
| | Island Dike | ESE-11/43 | 0.12 | ESE | 103° | Quarterly | |
| | Route 622 | ESE-12/44 | 4.70 | ESE | 115° | Quarterly | |
| | DVP Biology Lab | SE-13/45 | 0.64 | SE | 138° | Quarterly | |
| | Route 701 (Dam Entrance) | SE-14/46 | 5.88 | SE | 137° | Quarterly | |
| | "Aspen Hills" | SSE-15/47 | 0.93 | SSE | 158° | Quarterly | |
| | Elk Creek | SSE-16/48 | 2.33 | SSE | 165° | Quarterly | |

* In October 1991 the Surface Water Sample location at station 09 was moved to 09A.

** Shoreline soil was changed from station 09 to 08 effective with the August 1996 sample.

*** Air Sample Station at 01A was added in October 2007.

**** Station at 14a was added in October 2008 and Station 14 was deleted.

***** The dairy at Station 12 sold its dairy herd and ceased milking operations in May 2010.

# TABLE 2-1

North Anna Power Station – 2010
RADIOLOGICAL SAMPLING STATION
DISTANCE AND DIRECTION FROM UNIT NO. 1

| Sample Media | Location | Station | Distance | Direction | Degrees | Collection Frequency | Remarks |
|---|---|---|---|---|---|---|---|
| | NAPS Access Rd. | S-17/49 | 0.47 | S | 173° | Quarterly | |
| **Environmental** | Elk Creek Church | S-18/50 | 1.55 | S | 178° | Quarterly | |
| **Thermoluminescent** | NAPS Access Rd. | SSW-19/51 | 0.42 | SSW | 197° | Quarterly | |
| **Dosimetry (TLD)** | Route 618 | SSW-20/52 | 5.30 | SSW | 205° | Quarterly | |
| | 500kv Tower | SW-21/53 | 0.6 | SW | 218° | Quarterly | |
| | Route 700 | SW-22/54 | 3.96 | SW | 232° | Quarterly | |
| | NAPS Radio Tower | WSW-23/55 | 0.38 | WSW | 237° | Quarterly | |
| | Route 700 (Exclusion Boundary) | WSW-24/56 | 1.00 | WSW | 242° | Quarterly | |
| | South Gate Switchyard | W-25/57 | 0.32 | W | 279° | Quarterly | |
| | Route 685 | W-26/58 | 1.55 | W | 274° | Quarterly | |
| | End of Route 685 | WNW-27/59 | 1.00 | WNW | 301° | Quarterly | |
| | Route 685 | WNW-28/60 | 1.40 | WNW | 303° | Quarterly | |
| | North Gate - Construction Side Laydown Area | NW-29/61 | 0.45 | NW | 321° | Quarterly | |
| | Lake Anna Campground | NW-30/62 | 2.54 | NW | 319° | Quarterly | |
| | #1/#2 Intake | NNW-31/63 | 0.07 | NNW | 349° | Quarterly | |
| | Route 208 | NNW-32/64 | 2.21 | NNW | 344° | Quarterly | |
| | Bumpass Post Office | C-1/2 | 7.30 | SSE | 167° | Quarterly | |
| | Orange, VA | C-3/4 | 22.00 | NW | 325° | Quarterly | Control |
| | Mineral, VA | C-5/6 | 7.10 | WSW | 243° | Quarterly | |
| | Louisa, VA | C-7/8 | 11.54 | WSW | 257° | Quarterly | Control |
| **Airborne Particulate** | NAPS Sewage Treatment Plant | 01 | 0.20 | NE | 42° | Weekly | |
| **and Radioiodine** | Biology Lab*** | 01A | 0.64 | SE | 138° | Weekly | |
| | Mineral, VA | 03 | 7.10 | WSW | 243° | Weekly | |
| | Wares Crossroads | 04 | 5.10 | WNW | 287° | Weekly | |
| | Route 752 | 05 | 4.20 | NNE | 20° | Weekly | |
| | Sturgeon's Creek Marina | 05A | 2.04 | N | 11° | Weekly | |

* In October 1991 the Surface Water Sample location at station 09 was moved to 09A.
** Shoreline soil was changed from station 09 to 08 effective with the August 1996 sample.
*** Air Sample Station at 01A was added in October 2007.
**** Station at 14a was added in October 2008 and Station 14 was deleted.
***** The dairy at Station 12 sold its dairy herd and ceased milking operations in May 2010.

**TABLE 2-1**

North Anna Power Station – 2010

RADIOLOGICAL SAMPLING STATION

DISTANCE AND DIRECTION FROM UNIT NO. 1

| Sample Media | Location | Station | Distance | Direction | Degrees | Collection Frequency | Remarks |
|---|---|---|---|---|---|---|---|
| | Levy, VA | 06 | 4.70 | ESE | 115° | Weekly | |
| | Bumpass, VA | 07 | 7.30 | SSE | 167° | Weekly | |
| **Airborne Particulate** | End of Route 685 | 21 | 1.00 | WNW | 301° | Weekly | |
| **and Radioiodine** | Route 700 | 22 | 1.00 | WSW | 242° | Weekly | |
| | "Aspen Hills" | 23 | 0.93 | SSE | 158° | Weekly | |
| | Orange, VA | 24 | 22.00 | NW | 325° | Weekly | Control |
| **Surface Water** | Waste Heat Treatment Facility (Second Cooling Lagoon) | 08 | 3.37 | SSE | 148° | Monthly | |
| | *Lake Anna (upstream) (Route 669 Bridge) | 09A | 12.90 | WNW | 295° | Monthly | Control |
| **River Water** | North Anna River (downstream) | 11 | 5.80 | SE | 128° | Monthly | |
| **Ground Water** (Well Water) | Biology Lab | 01A | 0.64 | SE | 138° | Quarterly | |
| **Precipitation** | Biology Lab | 01A | 0.64 | SE | 138° | Monthly | |
| **Aquatic Sediment** | Waste Heat Treatment Facility (Second Cooling Lagoon) | 08 | 3.37 | SSE | 148° | Semi-Annually | |
| | Lake Anna (upstream) (Route 669 Bridge) | 09A | 12.90 | WNW | 295° | Semi-Annually | Control |
| | North Anna River (downstream) | 11 | 5.80 | SE | 128° | Semi-Annually | |
| **Shoreline Soil** | Waste Heat Treatment Facility (Second Cooling Lagoon) | 08 ** | 3.37 | SSE | 148° | Semi-Annually | |
| **Soil** | NAPS Sewage Treatment Plant | 01 | 0.20 | NE | 42° | Once/3 years | |

* In October 1991 the Surface Water Sample location at station 09 was moved to 09A.
** Shoreline soil was changed from station 09 to 08 effective with the August 1996 sample.
*** Air Sample Station at 01A was added in October 2007.
**** Station at 14a was added in October 2008 and Station 14 was deleted.
***** The dairy at Station 12 sold its dairy herd and ceased milking operations in May 2010.

# TABLE 2-1

North Anna Power Station – 2010

RADIOLOGICAL SAMPLING STATION

DISTANCE AND DIRECTION FROM UNIT NO. 1

| Sample Media | Location | Station | Distance | Direction | Degrees | Collection Frequency | Remarks |
|---|---|---|---|---|---|---|---|
| | Fredericks Hall | 02 | 5.30 | SSW | 203° | Once/3 years | |
| | Mineral, VA | 03 | 7.10 | WSW | 243° | Once/3 years | |
| | Wares Crossroads | 04 | 5.10 | WNW | 287° | Once/3 years | |
| **Soil** | Route 752 | 05 | 4.20 | NNE | 20° | Once/3 years | |
| | Sturgeon's Creek Marina | 05A | 2.04 | N | 11° | Once/3 years | |
| | Levy, VA | 06 | 4.70 | ESE | 115° | Once/3 years | |
| | Bumpass, VA | 07 | 7.30 | SSE | 167° | Once/3 years | |
| | End of Route 685 | 21 | 1.00 | WNW | 301° | Once/3 years | |
| | Route 700 (Exclusion Boundary) | 22 | 1.00 | WSW | 242° | Once/3 years | |
| | "Aspen Hills" | 23 | 0.93 | SSE | 158° | Once/3 years | |
| | Orange, VA | 24 | 22.00 | NW | 325° | Once/3 years | Control |
| **Milk** | Holladay Dairy (R.C. Goodwin) | 12***** | 8.30 | NW | 310° | Monthly | |
| | Lakeside Dairy | 12A | 7.50 | NW | 310° | Monthly | |
| **Fish** | Waste Heat Treatment Facility (Second Cooling Lagoon) | 08 | 3.37 | SSE | 148° | Semi-Annually | |
| | Lake Orange | 25 | 16.5 | NW | 312° | Semi-Annually | Control |
| **Food Products** | Moody Lane*** | 14a | 1.70 | ESE | 103° | Monthly if available or at harvest | |
| Vegetation) | Route 614 | 15 | 1.37 | SE | 133° | Monthly if available or at harvest | |
| | Route 629/522 | 16 | 12.60 | NW | 314° | Monthly if available or at harvest | Control |
| | Aspen Hills | 23 | 0.93 | SSE | 158° | Monthly if available or at harvest | |
| | "Historic Lane" | 26 | 1.15 | S | 172 ° | Monthly if available or at harvest | |

* In October 1991 the Surface Water Sample location at station 09 was moved to 09A.

** Shoreline soil was changed from station 09 to 08 effective with the August 1996 sample.

*** Air Sample Station at 01A was added in October 2007.

**** Station at 14a was added in October 2008 and Station 14 was deleted.

***** The dairy at Station 12 sold its dairy herd and ceased milking operations in May 2010.

# TABLE 2-2

North Anna Power Station

SAMPLE ANALYSIS PROGRAM

| SAMPLE MEDIA | FREQUENCY | ANALYSIS | LLD | REPORT UNITS |
|---|---|---|---|---|
| **Thermoluminescent Dosimetry (TLD)** | | | | |
| (84 TLDs) | Quarterly | Gamma Dose | 2 mR±2mR | mR/std. Month |
| (12 TLDs) | Annually | Gamma Dose | 2 mR±2mR | mR/std. Month |
| **Airborne Radioiodine** | Weekly | I-131 | 0.07 | $pCi/m^3$ |
| **Airborne Particulate** | Weekly | Gross Beta | 0.01 | $pCi/m^3$ |
| | Quarterly (a) | Gamma Isotopic | | $pCi/m^3$ |
| | | Cs-134 | 0.05 | |
| | | Cs-137 | 0.06 | |
| | $2^{nd}$ Quarter | Sr-89 | (b) | $pCi/m^3$ |
| | Composite | Sr-90 | (b) | |
| **Surface Water** | Monthly | I-131 | 1(c) | pCi/L |
| | | Gamma Isotopic | | pCi/L |
| | | Mn-54 | 15 | |
| | | Fe-59 | 30 | |
| | | Co-58 | 15 | |
| | | Co-60 | 15 | |
| | | Zn-65 | 30 | |
| | | Zr-95 | 30 | |
| | | Nb-95 | 15 | |
| | | Cs-134 | 15 | |
| | | Cs-137 | 18 | |
| | | Ba-140 | 60 | |
| | | La-140 | 15 | |
| | Quarterly(a) | Tritium (H-3) | 2000 | pCi/L |
| | $2^{nd}$ Quarter | Sr-89 | (b) | pCi/L |
| | Composite | Sr-90 | (b) | |
| **River Water** | Monthly | I-131 | 1(c) | pCi/L |
| | | Gamma Isotopic | | pCi/L |
| | | Mn-54 | 15 | |
| | | Fe-59 | 30 | |
| | | Co-58 | 15 | |
| | | Co-60 | 15 | |
| | | Zn-65 | 30 | |
| | | Zr-95 | 30 | |
| | | Nb-95 | 15 | |
| | | Cs-134 | 15 | |
| | | Cs-137 | 18 | |
| | | Ba-140 | 60 | |
| | | La-140 | 15 | |

*LLDs indicate those levels to which environmental samples are required to be analyzed. Actual analysis of samples may be lower than the listed values.

(a) Quarterly composite of each location's samples are used for the required analysis

(b) There are no required LLDs for Sr-89/90

(c) LLD for non-drinking water is 10 pCi/liter.

# TABLE 2-2
North Anna Power Station
SAMPLE ANALYSIS PROGRAM

| SAMPLE MEDIA | FREQUENCY | ANALYSIS | LLD | REPORT UNITS |
|---|---|---|---|---|
| **River Water** | Quarterly(a) | Tritium (H-3) | 2000 | pCi/L |
| | 2nd Quarter | Sr-89 | (b) | pCi/L |
| | Composite | Sr-90 | (b) | |
| **Ground Water (Well Water)** | Quarterly | Gamma Isotopic | | pCi/L |
| | | Mn-54 | 15 | |
| | | Fe-59 | 30 | |
| | | Co-58 | 15 | |
| | | Co-60 | 15 | |
| | | Zn-65 | 30 | |
| | | Zr-95 | 30 | |
| | | Nb-95 | 15 | |
| | | I-131 | 10(c) | |
| | | Cs-134 | 15 | |
| | | Cs-137 | 18 | |
| | | Ba-140 | 60 | |
| | | La-140 | 15 | |
| | Quarterly(a) | Tritium (H-3) | 2000 | pCi/L |
| | 2nd Quarter | Sr-89 | (b) | pCi/L |
| | | Sr-90 | (b) | |
| **Aquatic Sediment** | Semi-Annually | Gamma Isotopic | | pCi/kg (dry) |
| | | Cs-134 | 150 | |
| | | Cs-137 | 180 | |
| | Annually | Sr-89 | (b) | pCi/kg (dry) |
| | | Sr-90 | (b) | |
| **Precipitation** | Monthly | Gross Beta | 4 | pCi/L |
| | Semi-Annual | Gamma Isotopic | | pCi/L |
| | Composite (1) | Mn-54 | 15 | |
| | | Fe-59 | 30 | |
| | | Co-58 | 15 | |
| | | Co-60 | 15 | |
| | | Zn-65 | 30 | |
| | | Zr-95 | 30 | |
| | | Nb-95 | 15 | |
| | | I-131(1) | | |
| | | Cs-134 | 15 | |
| | | Cs-137 | 18 | |
| | | Ba-140(1) | | |
| | | La-140(1) | | |

(1) LLD applied are those for water samples. However, since this is a semi-annual composite no LLD is applied for these nuclides.

| | | | | |
|---|---|---|---|---|
| **Shoreline Soil** | Semi-Annually | Gamma Isotopic | | pCi/kg (dry) |
| | | Cs-134 | 150 | |
| | | Cs-137 | 180 | |
| | Annually | Sr-89 | (b) | pCi/kg (dry) |
| | | Sr-90 | (b) | |

*LLDs indicate those levels to which environmental samples are required to be analyzed. Actual analysis of samples may be lower than the listed values.

(a) Quarterly composite of each location's samples are used for the required analysis

(b) There are no required LLDs for Sr-89/90

(c) LLD for non-drinking water is 10 pCi/liter.

**TABLE 2-2**

North Anna Power Station

SAMPLE ANALYSIS PROGRAM

| SAMPLE MEDIA | FREQUENCY | ANALYSIS | LLD | REPORT UNITS |
|---|---|---|---|---|
| **Soil** | Once per 3 years | Gamma Isotopic | | pCi/kg (dry) |
| | | Cs-134 | 150 | |
| | | Cs-137 | 180 | |
| | | Sr-89 | (b) | pCi/kg (dry) |
| | | Sr-90 | (b) | |
| **Milk** | Monthly | I-131 | 1 | pCi/L |
| | Monthly | Gamma Isotopic | | |
| | | Cs-134 | 15 | |
| | | Cs-137 | 18 | |
| | | Ba-140 | 60 | |
| | | La-140 | 15 | |
| | Quarterly | Sr-89 | (b) | pCi/L |
| | | Sr-90 | (b) | |
| **Fish** | Semi-Annually | Gamma Isotopic | | pCi/kg (wet) |
| | | Mn-54 | 130 | |
| | | Fe-59 | 260 | |
| | | Co-58 | 130 | |
| | | Co-60 | 130 | |
| | | Zn-65 | 260 | |
| | | Cs-134 | 130 | |
| | | Cs-137 | 150 | |
| **Food Products (Broadleaf Vegetation)** | Monthly, if available, or at harvest | Gamma Isotopic | | pCi/kg (wet) |
| | | Cs-134 | 60 | |
| | | Cs-137 | 80 | |
| | | I-131 | 60 | |

*LLDs indicate those levels to which environmental samples are required to be analyzed. Actual analysis of samples may be lower than the listed values.

(a) Quarterly composite of each location's samples are used for the required analysis

(b) There are no required LLDs for Sr-89/90

(c) LLD for non-drinking water is 10 pCi/liter.

## Legend For The North Anna Power Station
## Environmental Monitoring Stations Overview Maps

| Map Designation | Environmental Station Identification | Map Designation | Environmental Station Identification |
|---|---|---|---|
| 1 (a) | 01,NE-5/37 | 27 | 27-Milk |
| 1A | 01A,SE-13/45 | 7/8 | C-7/8 |
| 2 (a) | 02,SSW-20/52 | 1/33 | N-1/33 |
| 3 (a) | 03,C-5/6 | 31/63 | NNW-31/63 |
| 4 (a) | 04 | 29/61 | NW-29/61 |
| 5 (a) | 05 | 3/35 | NNE-3/35 |
| 5A (a) | 05A,N-2/34 | 7/39 | ENE-7/39 |
| 6 (a) | 06,ESE-12/44 | 9/41 | E-9/41 |
| 7 (a) | 07, C-1/2 | 11/43 | ESE-11/43 |
| 8 | 08-Water, Fish, Sediment, | 17/49 | S-17/49 |
| | Shoreline Soil | 19/51 | SSW-19/51 |
| 9A | 09A-Water sample, Sediment | 21/53 | SW-21/53 |
| 11 | 11-River Water, Sediment | 23/55 | WSW-23/55 |
| 12 | 12-Milk | 25/57 | W-25/57 |
| 12A (e) | 12A-Milk | 16/48 | SSE-16/48 |
| 14a (d) | 14a-Vegetation | 14/46 | SE-14/46 |
| 15 | 15-Vegetation | 22/54 | SW-22/54 |
| 16 | 16-Vegetation | 26/58 | W-26/58 |
| 21 (a) | 21,WNW-27/59 | 28/60 | WNW-28/60 |
| 22 (a) | 22,WSW-24/56 | 32/64 | NNW-32/64 |
| 23 (a) | 23-SSE-15/47 | 8/40 | ENE-8/40 |
| 24 (a)(b) | 24,C-3/4 | 4/36 | NNE-4/36 |
| 25 (c) | 25-Fish | 10/42 | E-10/42 |
| 26 | 26-Vegetation | | |

(a) Indicates air sample station, annual and quarterly TLD, Triennial soil.
(b) In Orange
(c) In Lake Orange
(d) Station 14a replaced 14 in October 2008
(e) Dairy at Station 12 ceased milking in May 2010.

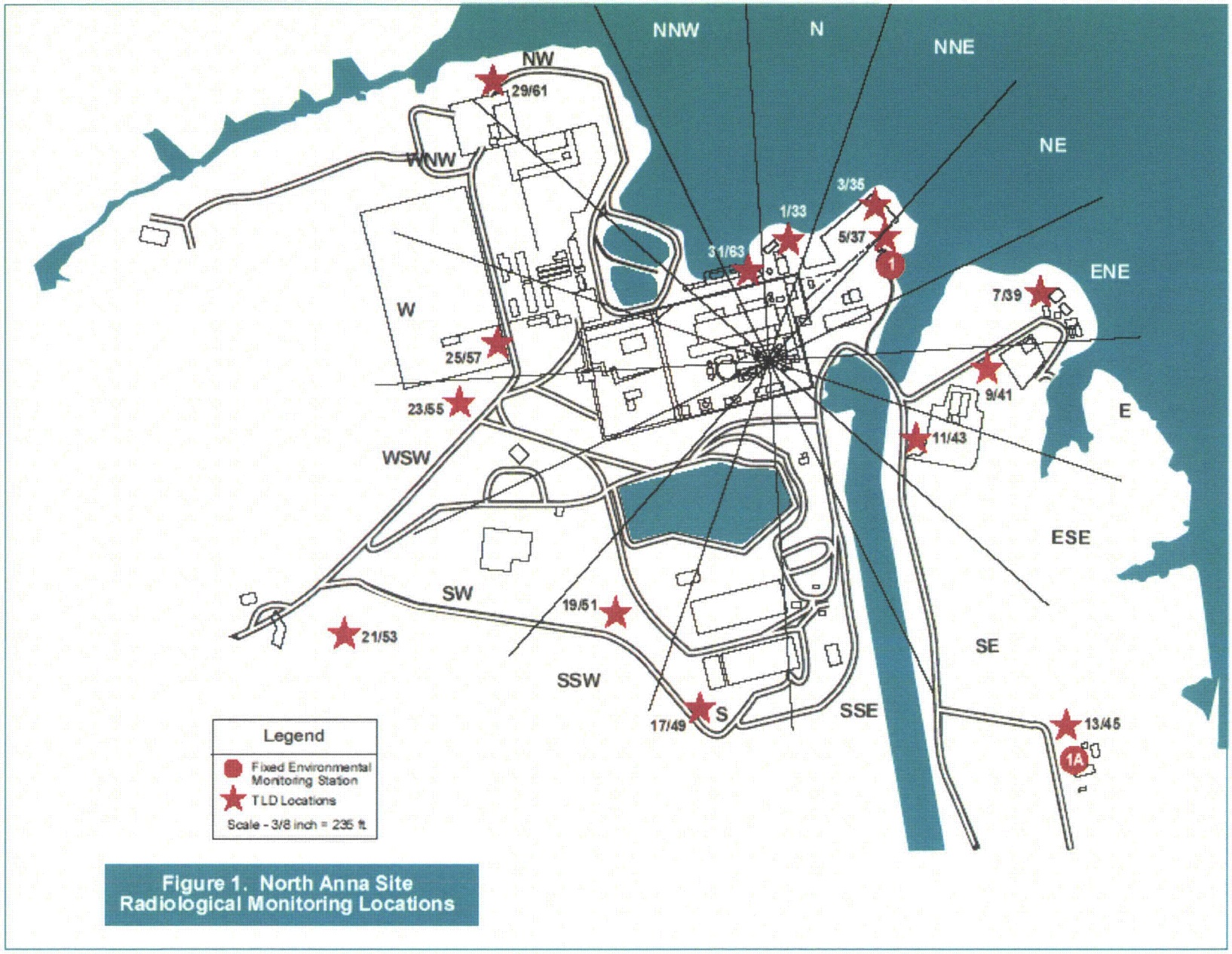
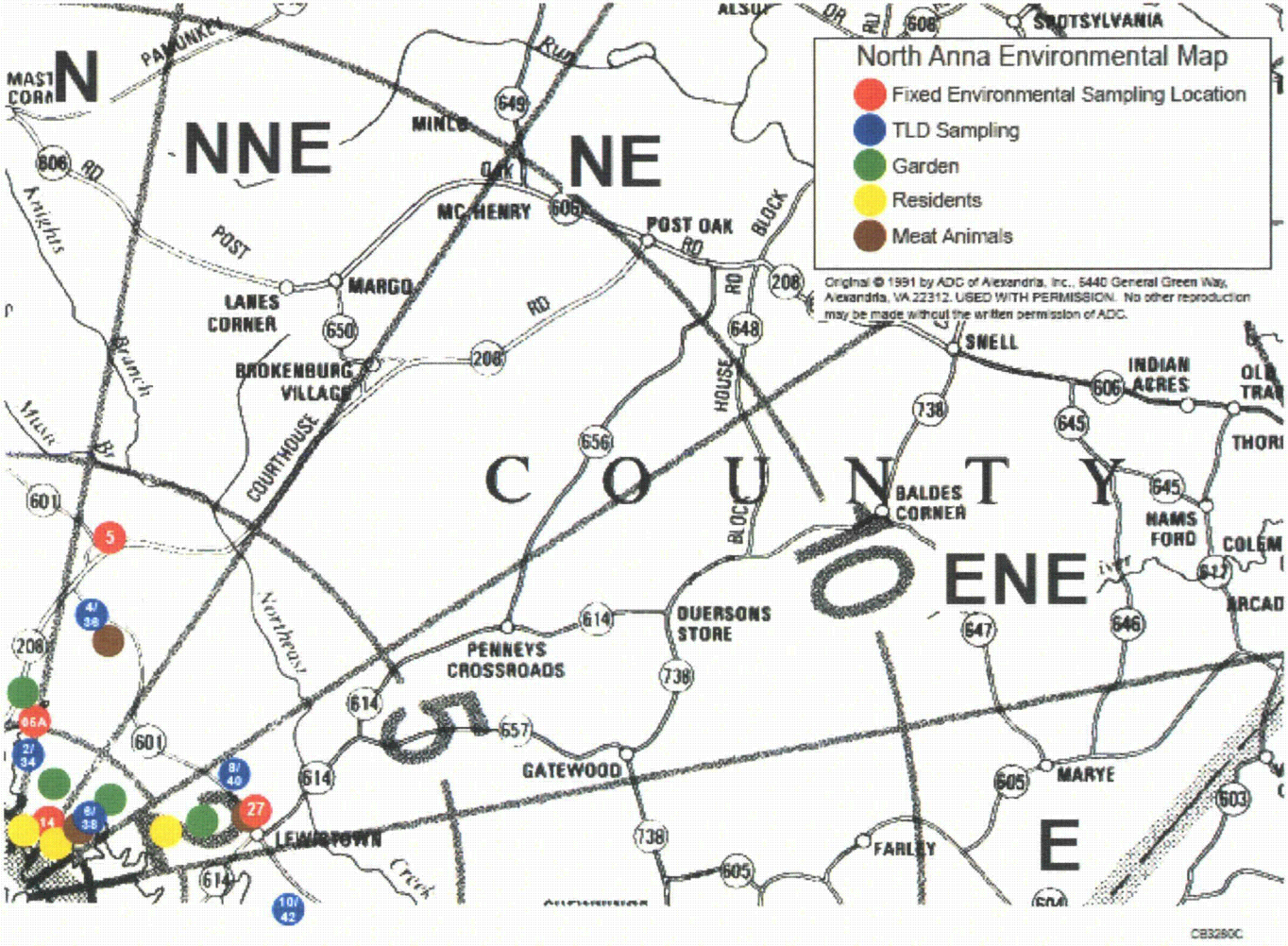
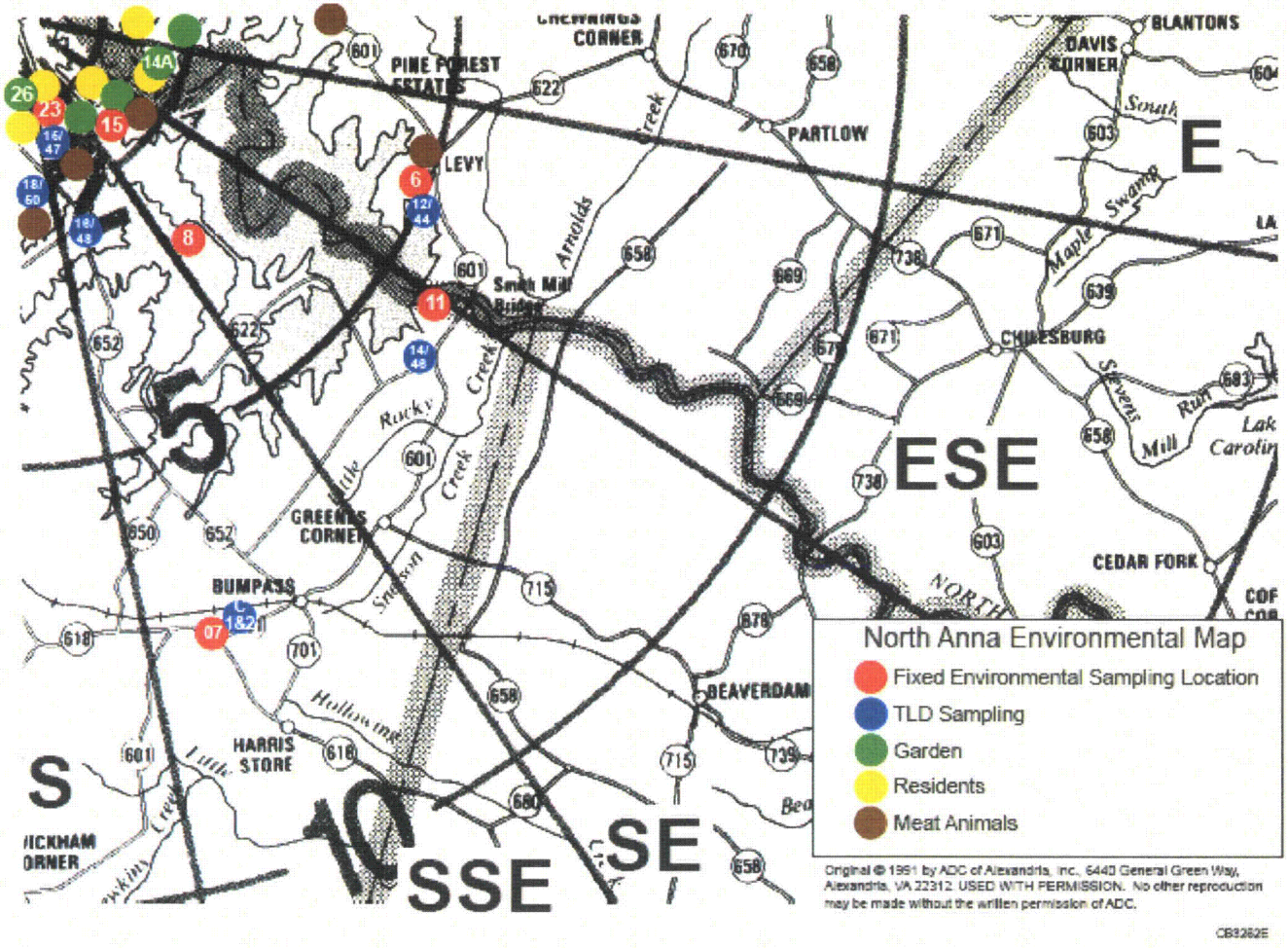
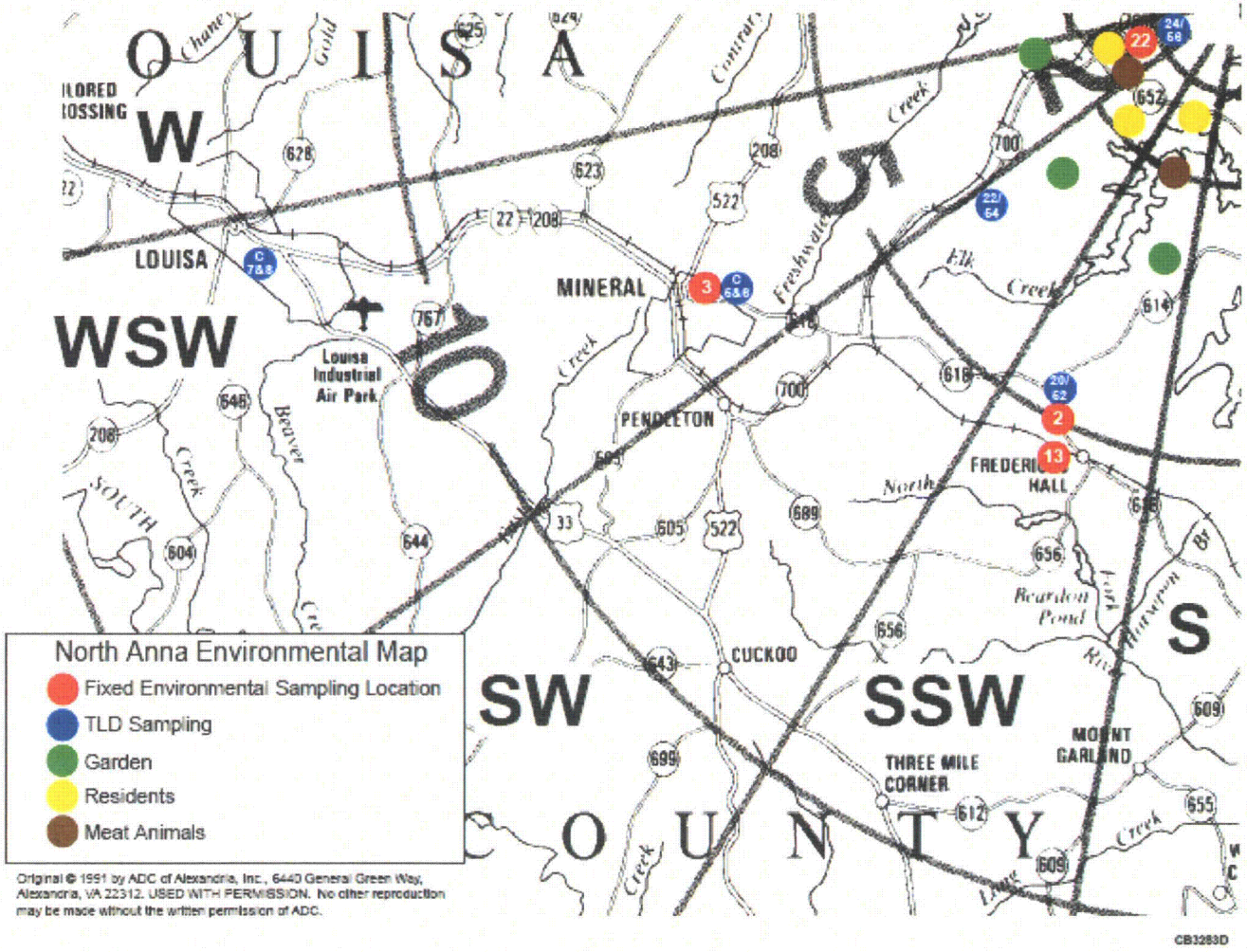



**Figure 1. North Anna Site Radiological Monitoring Locations**


North Anna Environmental Map
Fixed Environmental Sampling Location
TLD Sampling
Garden
Residents
Meat Animals
Original © 1991 by ADC of Alexandria, Inc., 5440 General Green Way, Alexandria, VA 22312. USED WITH PERMISSION. No other reproduction may be made without the written permission of ADC.
NNE
NE
ENE
E
COUNTY
SPOTSYLVANIA
MINERAL
MC HENRY
POST OAK
MARGO
LANES CORNER
BROKENBURG VILLAGE
COURTHOUSE
SNELL
INDIAN ACRES
BALDES CORNER
NAMS FORD
PENNEYS CROSSROADS
QUERSONS STORE
GATEWOOD
MARYE
FARLEY
LEWISTOWN
Creek
CB3280C


North Anna Environmental Map
Fixed Environmental Sampling Location
TLD Sampling
Garden
Residents
Meat Animals
Original © 1991 by ADC of Alexandria, Inc., 6440 General Green Way, Alexandria, VA 22312. USED WITH PERMISSION. No other reproduction may be made without the written permission of ADC.
CB3262E
PINE FOREST ESTATES
LEVY
PARTLOW
DAVIS CORNER
BLANTONS
CHILESBURG
GREENES CORNER
BUMPASS
HARRIS STORE
BEAVERDAM
CEDAR FORK
Rocky Creek
Little Rocky Creek
Arnolds Creek
Stevens Mill Run
Maple Swamp
South
Hollowing
5
10
E
ESE
SE
SSE
S

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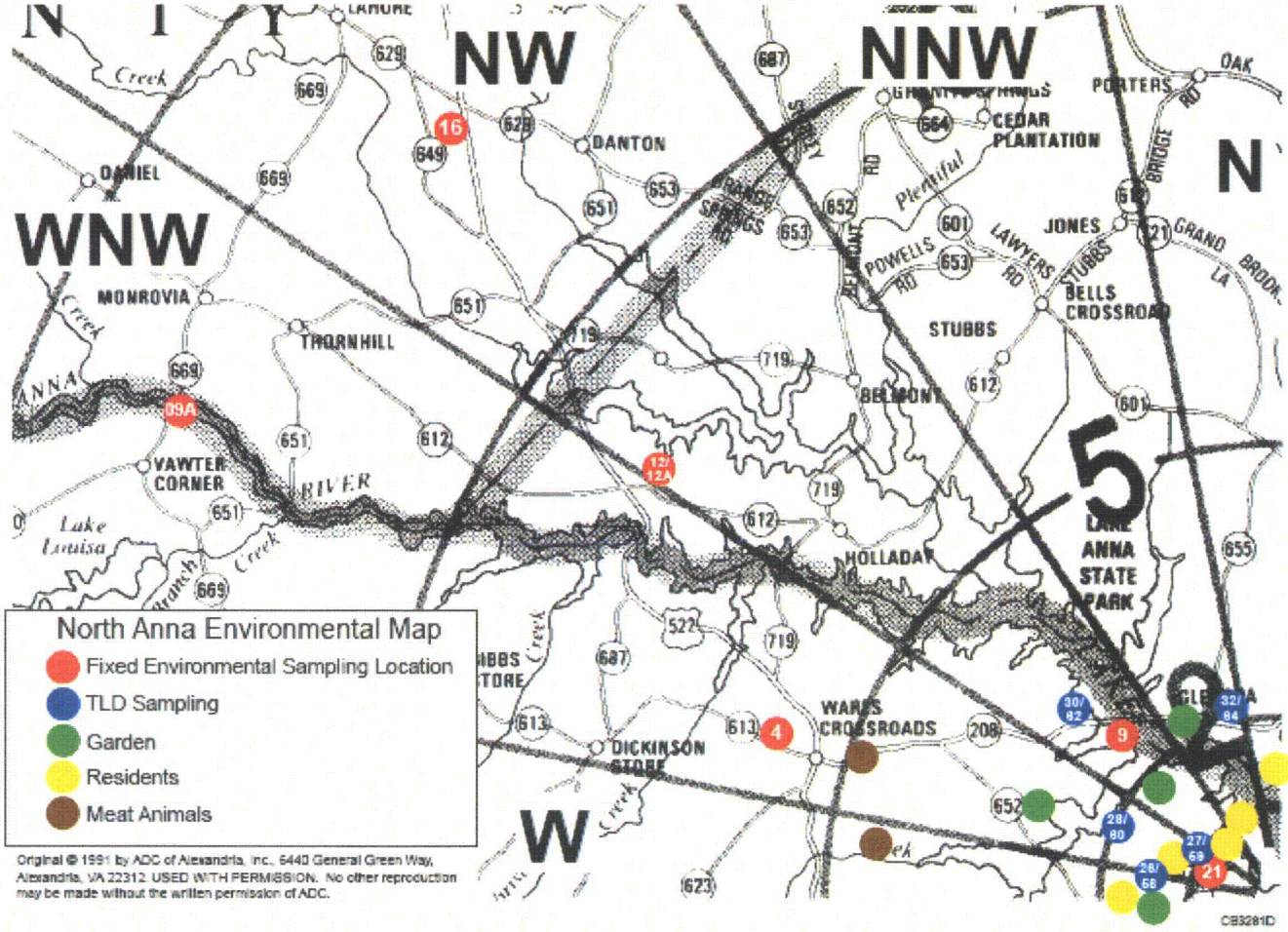


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# 3. ANALYTICAL RESULTS

## *3.1 Summary of Results*

In accordance with the North Anna Offsite Dose Calculation Manual (ODCM), a summary table of the analytical results has been prepared and is presented in Table 3-1. This data is presented in accordance with the format of the USNRC Branch Technical Position, "Acceptable Radiological Environmental Monitoring Program", Rev. 1, November 1979. The LLD listed value is taken from the ODCM. For radioanalytic analyses, the values listed in the columns indicated as "Mean/Range" include any results above the Minimum Detectable Concentration, MDC. Results are considered true positives when the measured value exceeds both the MDC and the $2\sigma$ error. For TLDs the mean and range include all values.

A more detailed analysis of the data is given in Section 4 where a discussion of the variations in the data explains many aspects that are not evident in the Summary Table because of the basic limitation of data summaries.

## Table 3-1

### *RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY*

North Anna Nuclear Power Station, Louisa County, Virginia – 2010

Docket No. 50-338/339 Page 1 of 8

| Medium or Pathway Sampled (Unit) | Analysis Type | Analysis Total No. | LLD[1] (pCi/unit) | All Indicator Locations Mean Range | Indicator Location with Highest Mean Name | Indicator Location with Highest Mean Distance Direction | Indicator Location with Highest Mean Mean Range | Control Location Mean Range | Non-routine Reported Measure-ments |
|---|---|---|---|---|---|---|---|---|---|
| **Direct Radiation** (mR/std. Month) (Sector TLDs) | Gamma Dose | 256 | 2 | 5.3(256/256) (0.9-39.2) | 19/51[2] | 0.42 mi. SSW | 27.9(8/8) (7.8-39.2) | 3.4(16/16)* (2.3-5.1) | 0 |
| **Direct Radiation** (mR/std. Month) (Pre-operational TLDs) | Gamma Dose | 32 | 2 | 2.6(16/16) (1.7-3.7) | C-1/2 | 7.3 mi. SSE | 2.9 (8/8) (2.0-3.7) | 3.4(16/16)* (2.3-5.1) | 0 |
| **Direct Radiation** (mR/std. Month) (Emergency Sector TLDs) | Gamma Dose | 40 | 2 | 5.3(40/40) (2.9-9.3) | EPSP-09/10 | 0.37 mi. ENE | 7.5(8/8) (5.1-9.3) | 3.4(16/16)* (2.3-5.1) | 0 |
| **Direct Radiation** (mR/std. month) (Environmental TLDs) | Gamma Dose | 48 | 2 | 3.4(44/44) (1.5-6.4) | 23 | 0.93 mi. SSE | 4.9(4/4) (4.2-6.2) | 3.3(4/4) (2.0-4.9) | 0 |
| **Direct Radiation** (mR/std. Month) (Annual TLDs) | Gamma Dose | 12 | 2 | 3.4(11/11) (2.2-5.1) | 01 | 0.20 mi. NE | 5.1(1/1) (5.1) | 2.6(1/1) (2.6) | 0 |
| **Airborne Particulates** (1E-03 pCi/$m^3$) | Gross Beta | 685 | 0.01 | 17.0(633/633) (4.83- 34.4) | 02 | 5.30 mi. SSW | 20.5(52/52) (8.55-35.5) | 20.0(52/52) (9.55-41.0) | 0 |
| **Air Iodine** (pCi/$m^3$) | I-131 | 685 | 0.07 | (0/633) | N/A | N/A | N/A | (0/52) | 0 |
| **Airborne Particulates** (1E-03 pCi/$m^3$) | Gamma | 52 | | | | | | | |
| | Be-7 | 52 | - | 151(48/48) (103-226) | 05A | 2.04 mi. N | 165(4/4) (129-226) | 160(4/4) (117-196) | 0 |
| | Cs-134 | 52 | 0.05 | (0/48) | N/A | N/A | N/A | (0/4) | 0 |

(1) mR/std month for TLDs
(2) 19/51 located onsite near ISFSI.
* C-3/4, -7/8 used as control locations

## Table 3-1

### *RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY*

North Anna Nuclear Power Station, Louisa County, Virginia – 2010

Docket No. 50-338/339 Page 2 of 8

| Medium or Pathway Sampled (Unit) | Analysis Type | Analysis Total No. | LLD (pCi/unit) | All Indicator Locations Mean Range | Indicator Location with Highest Mean Name | Indicator Location with Highest Mean Distance Direction | Indicator Location with Highest Mean Mean Range | Control Location Mean Range | Non-routine Reported Measurements |
|---|---|---|---|---|---|---|---|---|---|
| **Airborne Particulates** (1E-03 pCi/$m^3$) | Cs-137 | 52 | 0.06 | (0/48) | N/A | N/A | N/A | (0/4) | 0 |
| | Sr-89 | 13 | - | (0/12) | N/A | N/A | N/A | (0/1) | 0 |
| | Sr-90 | 13 | - | (0/12) | N/A | N/A | N/A | (0/1) | 0 |
| **Soil** (pCi/Kg) (dry) | Triennial Gamma | 24 | | | | | | | |
| | K-40 | 24 | - | 10800 (22/22) (2130-24000) | 23 | 0.93 SSE | 23400 (2/2) (22700-24000) | 4010 (2/2) (2780-5230) | 12 |
| | Cs-134 | 24 | 150 | 237 (3/22) (75.2-327) | 23 | 0.93 SSE | 327 (1/2) (327) | (0/2) | 12 |
| | Cs-137 | 24 | 180 | 283(18/22) (52.7-732) | 4 | 5.10 WNW | 567 (2/2) (401 - 732) | 223 (2/2) (84.2-362) | 12 |
| | Ra-226 | 24 | - | 2400(17/22) (1260-4630) | 22 | 1.00 WSW | 4150(2/2) (3660-4630) | 2900(2/2) (2790-3010) | 12 |
| | Th-228 | 24 | - | 1130(22/22) (451-2330) | 22 | 1.00 WSW | 1850(2/2) (1690-2010) | 1270(2/2) (1010-1530) | 12 |
| | Th-232 | 24 | | 1080(21/22) (387-2090) | 22 | 1.00 WSW | 1830(2/2) (1750-1900) | 1090(2/2) (1080-1210) | 12 |
| | Sr-89 | 24 | - | (0/22) | N/A | N/A | N/A | (0/2) | 12 |
| | Sr-90 | 24 | - | (0/22) | N/A | N/A | N/A | (0/2) | 12 |
| **Precipitation** (pCi/liter) | Monthly Gross Beta | 12 | 4 | 5.18(10/12) (1.96-23.5) | 01A | 0.64 mi. SE | 5.18(10/12) (1.96-23.5) | N/A | 0 |
| | Semiannual Gamma | 2 | | | | | | | |
| | Be-7 | 2 | - | 37.8(1/2) (37.8) | 01A | 0.64 mi. SE | 37.8(1/2) (37.8) | N/A | 0 |
| | Mn-54 | 2 | 15 | (0/2) | N/A | N/A | N/A | N/A | 0 |

## Table 3-1

### *RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY*

North Anna Nuclear Power Station, Louisa County, Virginia – 2010

Docket No. 50-338/339 Page 3 of 8

| Medium or Pathway Sampled (Unit) | Analysis | | LLD (pCi/unit) | All Indicator Locations | Indicator Location with Highest Mean | | | Control Location | Non-routine |
|---|---|---|---|---|---|---|---|---|---|
| | Type | Total No. | | Mean Range | Name | Distance Direction | Mean Range | Mean Range | Reported Measure-ments |
| **Precipitation** (pCi/liter) | Fe-59 | 2 | 30 | (0/2) | N/A | N/A | N/A | N/A | 0 |
| | Co-58 | 2 | 15 | (0/2) | N/A | N/A | N/A | N/A | 0 |
| | Co-60 | 2 | 15 | (0/2) | N/A | N/A | N/A | N/A | 0 |
| | Zn-65 | 2 | 30 | (0/2) | N/A | N/A | N/A | N/A | 0 |
| | Zr-95 | 2 | 30 | (0/2) | N/A | N/A | N/A | N/A | 0 |
| | Nb-95 | 2 | 15 | (0/2) | N/A | N/A | N/A | N/A | 0 |
| | I-131 | 2 | | (0/2) | N/A | N/A | N/A | N/A | 0 |
| | Cs-134 | 2 | 15 | (0/2) | N/A | N/A | N/A | N/A | 0 |
| | Cs-137 | 2 | 18 | (0/2) | N/A | N/A | N/A | N/A | 0 |
| | Ba-140 | 2 | | (0/2) | N/A | N/A | N/A | N/A | 0 |
| | La-140 | 2 | | (0/2) | N/A | N/A | N/A | N/A | 0 |
| | Th-228 | 2 | | (0/2) | N/A | N/A | N/A | N/A | 0 |
| | Th-232 | 2 | | 4.49(1/2) (4.49) | 01A | 0.64 mi. SE | 4.49(1/2) (4.49) | N/A | 0 |
| **Milk** (pCi/liter) | Gamma | 12 | | | | | | | |
| | K-40 | 12 | - | 1340(12/12) (1160-1520) | 12 | 8.3 mi. NW | 1430(4/4) (1270-1520) | N/A | 0 |
| | I-131 | 12 | 1 | (0/12) | N/A | N/A | N/A | N/A | 0 |
| | Cs-134 | 12 | 15 | (0/12) | N/A | N/A | N/A | N/A | 0 |

## Table 3-1

### *RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY*

North Anna Nuclear Power Station, Louisa County, Virginia – 2010

Docket No. 50-338/339 Page 4 of 8

| Medium or Pathway Sampled (Unit) | Analysis Type | Analysis Total No. | LLD (pCi/unit) | All Indicator Locations Mean Range | Indicator Location with Highest Mean Name | Indicator Location with Highest Mean Distance Direction | Indicator Location with Highest Mean Mean Range | Control Location Mean Range | Non-routine Reported Measurements |
|---|---|---|---|---|---|---|---|---|---|
| **Milk** (pCi/liter) | Cs-137 | 12 | 18 | (0/12) | N/A | N/A | N/A | N/A | 0 |
| | Ba-140 | 12 | 60 | (0/12) | N/A | N/A | N/A | N/A | 0 |
| | La-140 | 12 | 15 | (0/12) | N/A | N/A | N/A | N/A | 0 |
| | Sr-89 (Quarterly) | 7 | - | (0/5) | N/A | N/A | N/A | N/A | 1 |
| | Sr-90 (Quarterly) | 7 | - | (0/5) | N/A | N/A | N/A | N/A | 1 |
| **Food Vegetation** (pCi/kg) (wet) | Gamma | 30 | | | | | | | |
| | Be-7 | 30 | - | 1260(24/24) (382-2810) | 23 | varies SSE | 1620(5/6) (731-2810) | 709(6/6) (317-1260) | 0 |
| | K-40 | 30 | - | 4910(24/24) (2080-9560) | 14a | varies ESE | 6460(6/6) (4250-9560) | 5810(6/6) (3170-10700) | 0 |
| | I-131 | 30 | 60 | (0/24) | N/A | N/A | N/A | (0/6) | 0 |
| | Cs-134 | 30 | 60 | (0/24) | N/A | N/A | N/A | (0/6) | 0 |
| | Cs-137 | 30 | 80 | 26.1(1/24) | N/A | N/A | N/A | (0/6) | 0 |
| **Ground Well Water** (pCi/liter) | Tritium | 4 | 2000 | (0/4) | 01A | 0.64 mi. SE | (0/4) | N/A | 0 |
| | Gamma | 4 | | | | | | | |
| | Mn-54 | 4 | 15 | (0/4) | N/A | N/A | N/A | N/A | 0 |
| | Fe-59 | 4 | 30 | (0/4) | N/A | N/A | N/A | N/A | 0 |
| | Co-58 | 4 | 15 | (0/4) | N/A | N/A | N/A | N/A | 0 |

## Table 3-1

### *RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY*

North Anna Nuclear Power Station, Louisa County, Virginia – 2010

Docket No. 50-338/339 Page 5 of 8

| Medium or Pathway Sampled (Unit) | Analysis Type | Analysis Total No. | LLD (pCi/unit) | All Indicator Locations Mean Range | Indicator Location with Highest Mean Name | Indicator Location with Highest Mean Distance Direction | Indicator Location with Highest Mean Mean Range | Control Location Mean Range | Non-routine Reported Measurements |
|---|---|---|---|---|---|---|---|---|---|
| **Ground Well Water** (pCi/liter) | Co-60 | 4 | 15 | (0/4) | N/A | N/A | N/A | N/A | 0 |
| | Zn-65 | 4 | 30 | (0/4) | N/A | N/A | N/A | N/A | 0 |
| | Zr-95 | 4 | 30 | (0/4) | N/A | N/A | N/A | N/A | 0 |
| | Nb-95 | 4 | 15 | (0/4) | N/A | N/A | N/A | N/A | 0 |
| | I-131 | 4 | 10 | (0/4) | N/A | N/A | N/A | N/A | 0 |
| | Cs-134 | 4 | 15 | (0/4) | N/A | N/A | N/A | N/A | 0 |
| | Cs-137 | 4 | 18 | (0/4) | N/A | N/A | N/A | N/A | 0 |
| | Ba-140 | 4 | 60 | (0/4) | N/A | N/A | N/A | N/A | 0 |
| | La-140 | 4 | 15 | (0/4) | N/A | N/A | N/A | N/A | 0 |
| | Sr-89 | 1 | - | (0/1) | N/A | N/A | N/A | N/A | 0 |
| | Sr-90 | 1 | - | (0/1) | N/A | N/A | N/A | N/A | 0 |
| **River Water** (pCi/liter) | Tritium | 4 | 2000 | 3510(4/4) (2250-4660) | 11 | 5.80 mi. SE | 3510(4/4) (2250-4660) | (0/4)* | 0 |
| | Gamma | 12 | | | | | | | |
| | Mn-54 | 12 | 15 | (0/12) | N/A | N/A | N/A | (0/12)* | 0 |
| | Fe-59 | 12 | 30 | (0/12) | N/A | N/A | N/A | (0/12)* | 0 |
| | Co-58 | 12 | 15 | (0/12) | N/A | N/A | N/A | (0/12)* | 0 |
| | Co-60 | 12 | 15 | (0/12) | N/A | N/A | N/A | (0/12)* | 0 |
| | Zn-65 | 12 | 30 | (0/12) | N/A | N/A | N/A | (0/12)* | 0 |
| | Zr-95 | 12 | 30 | (0/12) | N/A | N/A | N/A | (0/12)* | 0 |

*Results of surface water taken at Location 09A used as control value for river water

## Table 3-1

### *RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY*

North Anna Nuclear Power Station, Louisa County, Virginia – 2010

Docket No. 50-338/339 Page 6 of 8

| Medium or Pathway Sampled (Unit) | Analysis Type | Analysis Total No. | LLD (pCi/unit) | All Indicator Locations Mean Range | Indicator Location with Highest Mean Name | Indicator Location with Highest Mean Distance Direction | Indicator Location with Highest Mean Mean Range | Control Location Mean Range | Non-routine Reported Measurements |
|---|---|---|---|---|---|---|---|---|---|
| **River Water** (pCi/liter) | Nb-95 | 12 | 15 | (0/12) | N/A | N/A | N/A | (0/12)* | 0 |
| | I-131 | 12 | 1 | (0/12) | N/A | N/A | N/A | (0/12)* | 0 |
| | Cs-134 | 12 | 15 | (0/12) | N/A | N/A | N/A | (0/12)* | 0 |
| | Cs-137 | 12 | 18 | (0/12) | N/A | N/A | N/A | (0/12)* | 0 |
| | Ba-140 | 12 | 60 | (0/12) | N/A | N/A | N/A | (0/12)* | 0 |
| | La-140 | 12 | 15 | (0/12) | N/A | N/A | N/A | (0/12)* | 0 |
| | Sr-89 | 1 | - | (1/0) | N/A | N/A | N/A | (1/0)* | 0 |
| | Sr-90 | 1 | - | (1/0) | N/A | N/A | N/A | (1/0)* | 0 |
| **Surface Water** (pCi/L) | Tritium | 8 | 2000 | 3100(4/4) (2340-4060) | 08 | 3.37 mi. SSE | 3100(4/4) (2340-4060) | (0/4) | 0 |
| | Gamma | 24 | | | | | | | |
| | Mn-54 | 24 | 15 | (0/12) | N/A | N/A | N/A | (0/12) | 0 |
| | Fe-59 | 24 | 30 | (0/12) | N/A | N/A | N/A | (0/12) | 0 |
| | Co-58 | 24 | 15 | (0/12) | N/A | N/A | N/A | (0/12) | 0 |
| | Co-60 | 24 | 15 | (0/12) | N/A | N/A | N/A | (0/12) | 0 |
| | Zn-65 | 24 | 30 | (0/12) | N/A | N/A | N/A | (0/12) | 0 |
| | Zr-95 | 24 | 30 | (0/12) | N/A | N/A | N/A | (0/12) | 0 |
| | Nb-95 | 24 | 15 | (6.28)(1/12) (6.28) | 08 | 3.37 mi. SSE | (6.28)(1/12) (6.28) | (0/12) | 0 |
| | I-131 | 24 | 1 | (0/12) | N/A | N/A | N/A | (0/12) | 0 |
| | Cs-134 | 24 | 15 | (0/12) | N/A | N/A | N/A | (0/12) | 0 |

*Results of surface water taken at Location 09A used as control value for river water

## Table 3-1

### *RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY*

North Anna Nuclear Power Station, Louisa County, Virginia – 2010

Docket No. 50-338/339 Page 7 of 8

| Medium or Pathway Sampled (Unit) | Analysis Type | Analysis Total No. | LLD (pCi/unit) | All Indicator Locations Mean Range | Indicator Location with Highest Mean Name | Indicator Location with Highest Mean Distance Direction | Indicator Location with Highest Mean Mean Range | Control Location Mean Range | Non-routine Reported Measure-ments |
|---|---|---|---|---|---|---|---|---|---|
| **Surface Water** (pCi/liter) | Cs-137 | 24 | 18 | (0/12) | N/A | N/A | N/A | (0/12) | 0 |
| | Ba-140 | 24 | 60 | (0/12) | N/A | N/A | N/A | (0/12) | 0 |
| | La-140 | 24 | 15 | (0/12) | N/A | N/A | N/A | (0/12) | 0 |
| | Sr-89 | 1 | - | (0/1) | N/A | N/A | N/A | (0/1) | 0 |
| | Sr-90 | 1 | - | (0/1) | N/A | N/A | N/A | (0/1) | 0 |
| **Sediment Silt** (pCi/kg) | Gamma | 6 | | | | | | | |
| | K-40 | 6 | - | 12900 (4/4) (3050 - 17900) | 11 | 5.80 mi. SSE | 16600(2/2) (15300 - 17900) | 12100(2/2) (11800-12400) | 0 |
| | Cs-134 | 6 | 150 | (0/4) | N/A | N/A | (0/2) | 176(1/2) (176) | 0 |
| | Cs-137 | 6 | 180 | 100(1/4) (100) | 08 | 3.37 mi. SSE | 100(1/2) 100 | 155(1/2) (155) | 0 |
| | Ra-226 | 6 | - | 2130(4/4) (1020-2950) | 11 | 5.80 mi. SSE | 2280(2/2) (2040-2520) | 2760(1/2) (2760) | 0 |
| | Th-228 | 6 | - | 1080(4/4) (356-1520) | 11 | 5.80 mi. SSE | 1230 (2/2) (1190-1270) | 802(2/2) (672-932) | 0 |
| | Th-232 | 6 | - | 1060 (4/4) (318-1540) | 11 | 5.80 mi. SSE | 1190(2/2) (1150-1230) | 713(2/2) (586-840) | 0 |
| | (Annually) Sr-89 | 3 | - | (0/2) | N/A | N/A | N/A | (0/1) | 0 |
| | Sr-90 | 3 | - | (0/2) | N/A | N/A | N/A | (0/1) | 0 |
| **Shoreline Soil** (pCi/kg) (dry) | Gamma | 2 | | | | | | | |
| | K-40 | 2 | - | 6060(2/2) (2770-9350) | 08 | 3.37 mi. SSE | 6060(2/2) (2770-9350) | N/A | 0 |

## Table 3-1

### *RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY*

North Anna Nuclear Power Station, Louisa County, Virginia – 2010

Docket No. 50-338/339 Page 8 of 8

| Medium or Pathway Sampled (Unit) | Analysis Type | Analysis Total No. | LLD (pCi/unit) | All Indicator Locations Mean Range | Indicator Location with Highest Mean Name | Indicator Location with Highest Mean Distance Direction | Indicator Location with Highest Mean Mean Range | Control Location Mean Range | Non-routine Reported Measurements |
|---|---|---|---|---|---|---|---|---|---|
| **Shoreline Soil** (pCi/kg) (dry) | Cs-134 | 2 | 150 | (0/2) | N/A | N/A | (0/2) | N/A | 0 |
| | Cs-137 | 2 | 180 | N/A | N/A | N/A | (0/2) | N/A | 0 |
| | Ra-226 | 2 | - | 1510(2/2) (1350-1670) | 08 | 3.37 mi. SSE | 1510(2/2) (1350-1670) | N/A | 0 |
| | Th-228 | 2 | - | 1070(2/2) (862-1270) | 08 | 3.37 mi. SSE | 1070(2/2) (862-1270) | N/A | 0 |
| | Th-232 | 2 | - | 1000(2/2) (894-1000) | 08 | 3.37 mi. SSE | 1000(2/2) (894-1000) | N/A | 0 |
| | (Annually) Sr-89 | 1 | - | (0/1) | N/A | N/A | N/A | N/A | 0 |
| | Sr-90 | 1 | - | (0/1) | N/A | N/A | N/A | N/A | 0 |
| Fish (pCi/kg) (wet) | Gamma | 8 | | | | | | | |
| | K-40 | 8 | - | 2220(4/4) (2080-2450) | 08 | 3.37 mi. SSE | 2220(4/4) (2080-2450) | 2260(4/4) (1610-3050) | 0 |
| | Mn-54 | 8 | 130 | (0/4) | N/A | N/A | N/A | (0/4) | 0 |
| | Fe-59 | 8 | 260 | (0/4) | N/A | N/A | N/A | (0/4) | 0 |
| | Co-58 | 8 | 130 | (0/4) | N/A | N/A | N/A | (0/4) | 0 |
| | Co-60 | 8 | 130 | (0/4) | N/A | N/A | N/A | (0/4) | 0 |
| | Zn-65 | 8 | 260 | (0/4) | N/A | N/A | N/A | (0/4) | 0 |
| | Cs-134 | 8 | 130 | (0/4) | N/A | N/A | N/A | (0/4) | 0 |
| | Cs-137 | 8 | 150 | (0/4) | N/A | N/A | N/A | (0/4) | 0 |

## *3.2 Analytical Results of 2010 REMP Samples*

Radiological analyses of environmental media characteristically approach and frequently fall below the detection limits of state-of-the-art measurement methods. The data reported in the following tables are strictly counting statistics: The reported error is two times the standard deviation ($2\sigma$) of the net activity. Unless otherwise noted, the overall error (counting, sample size, chemistry, errors, etc.) is estimated to be 2 to 5 times that listed. Results are considered true positives when the measured value exceeds both the MDC and the $2\sigma$ error.

Because of counting statistics, negative values, zeros and numbers below the Minimum Detectable Level (MDL) are statistically valid pieces of data[1]. For clarity of this report only detectable results are presented. TBE's analytical methods meet the Lower Limit of Detection (LLD) requirements given in Table 2 of the USNRC Branch Technical Position, "An Acceptable Radiological Environmental Monitoring Program", (November 1979, Revision 1) and the North Anna ODCM.

Data are given according to sample type as indicated below.

1. Gamma Exposure Rate
2. Air Particulates, Gross Beta Radioactivity
3. Air Particulates, Weekly I-131
4. Air Particulates, Quantitative Gamma Spectra
5. Air Particulate Strontium
6. Soil
7. Precipitation
8. Cow Milk
9. Food Products and Vegetation
10. Well Water
11. River Water
12. Surface Water
13. Bottom Sediment/Silt
14. Shoreline Soil
15. Fish

[1] Analytical results are handled as recommended by HASL (*"Reporting of Analytical Results from HASL,"* letter by Leo B. Higginbotham) and NUREG/CR-4007 (Sept. 1984).

**TABLE 3-2**

**DIRECT RADIATION MEASURMENTS - SECTOR QUARTERLY TLD RESULTS**

**mR/Std. Month (30.4 days) ± 2 Sigma**



| Station | First Quarter 12/29/2009 03/31/2010 | Second Quarter 03/31/2010 06/30/2010 | Third Quarter 06/30/2010 09/28/2010 | Fourth Quarter 09/28/2010 12/28/2010 | Quarterly* Average +/- 2 s.d. |
|---|---|---|---|---|---|
| N-1 | 6.5 | 4.4 | 4.7 | 5.3 | 5.0 +/- 2.0 |
| N-33 | 6.2 | 3.3 | 4.8 | 5.1 | |
| N-2 | 4.1 | 2.9 | 3.4 | 4.4 | 3.5 +/- 1.2 |
| N-34 | 3.8 | 2.9 | 2.9 | 3.8 | |
| NNE-3 | 8.3 | 4.7 | 6.4 | 8.2 | 6.9 +/- 3.3 |
| NNE-35 | 8.9 | 4.5 | 6.5 | 7.3 | |
| NNE-4 | 5.2 | 4.0 | 3.9 | 6.0 | 4.0 +/- 2.8 |
| NNE 36 | 1.7 | 2.6 | 3.7 | 4.8 | |
| NE-5 | 5.2 | 3.5 | 5.5 | 5.9 | 5.0 +/- 1.7 |
| NE-37 | 6.1 | 4.5 | 4.4 | 5.2 | |
| NE-6 | 4.3 | 2.4 | 3.5 | 3.8 | 3.4 +/- 1.5 |
| NE-38 | 4.1 | 2.2 | 3.2 | 3.7 | |
| ENE-7 | 6.5 | 4.2 | 5.1 | 7.2 | 5.9 +/- 2.4 |
| ENE-39 | 6.2 | 4.5 | 5.6 | 7.5 | |
| ENE-8 | 3.7 | 2.8 | 3.4 | 5.3 | 3.7 +/- 1.8 |
| ENE-40 | 3.7 | 2.8 | 3.3 | 4.7 | |
| E-9 | 5.2 | 4.4 | 5.0 | 5.9 | 5.2 +/- 1.2 |
| E-41 | 5.6 | 4.5 | 4.8 | 6.0 | |
| E-10 | 5.0 | 3.1 | 4.2 | 5.9 | 4.4 +/- 2.0 |
| E-42 | 5.0 | 2.9 | 4.5 | 4.9 | |
| ESE-11 | 5.2 | 3.0 | 4.3 | 4.8 | 4.3 +/- 1.7 |
| ESE-43 | 5.1 | 3.0 | 4.1 | 4.5 | |
| ESE-12 | 5.3 | 3.1 | 4.1 | 5.9 | 4.6 +/- 2.2 |
| ESE-44 | 5.4 | 3.3 | 4.0 | 5.8 | |
| SE-13 | 4.8 | 2.7 | 3.8 | 5.5 | 4.4 +/- 2.3 |
| SE-45 | 4.6 | 3.7 | 3.6 | 6.3 | |
| SE-14 | 7.3 | 6.1 | 5.9 | 8.1 | 6.5 +/- 2.1 |
| SE-46 | 7.1 | 4.6 | 6.4 | 6.8 | |
| SSE-15 | 5.5 | 3.5 | 4.5 | 5.9 | 4.9 +/- 2.4 |
| SSE-47 | 5.7 | 3.1 | 4.3 | 6.4 | |
| SSE-16 | 3.3 | 1.5 | 2.9 | 4.0 | 2.9 +/- 1.8 |
| SSE-48 | 2.9 | 1.8 | 3.0 | 4.1 | |

*Average of collocated TLDs.

**TABLE 3-2**

**DIRECT RADIATION MEASURMENTS - SECTOR QUARTERLY TLD RESULTS**

**mR/Std. Month (30.4 days) ± 2 Sigma**



| Station | First Quarter 12/29/2009 03/31/2010 | Second Quarter 03/31/2010 06/30/2010 | Third Quarter 06/30/2010 09/28/2010 | Fourth Quarter 09/28/2010 12/28/2010 | Quarterly* Average +/- 2 s.d. |
|---|---|---|---|---|---|
| S-17 | 8.5 | 5.8 | 7.2 | 8.4 | 7.7 +/- 2.3 |
| S-49 | 8.3 | 6.8 | 7.3 | 9.3 | |
| S-18 | 3.2 | 1.3 | 2.3 | 2.9 | 2.6 +/- 1.5 |
| S-50 | 2.7 | 2.2 | 2.3 | 3.9 | |
| SSW-19 | 24.2 | 14.5 | 33.7 | 39.2 | 27.9 +/- 23.0 |
| SSW-51 | 39.1 | 32.3 | 32.3 | 7.8 | |
| SSW-20 | 2.9 | 1.4 | 2.4 | 3.0 | 2.4 +/- 1.6 |
| SSW-52 | 3.1 | 1.2 | 2.0 | 3.4 | |
| SW-21 | 4.7 | 4.1 | 4.5 | 6.0 | 4.7 +/- 1.9 |
| SW-53 | 5.5 | 2.9 | 4.7 | 5.1 | |
| SW-22 | 5.1 | 4.0 | 4.5 | 5.5 | 4.7 +/- 1.7 |
| SW-54 | 5.8 | 3.2 | 4.6 | 4.7 | |
| WSW-23 | 5.6 | 4.1 | 7.2 | 6.1 | 5.8 +/- 2.6 |
| WSW-55 | 6.5 | 3.9 | 5.2 | 7.4 | |
| WSW-24 | 5.1 | 3.2 | 4.5 | 5.8 | 4.7 +/- 1.7 |
| WSW-56 | 5.0 | 4.2 | 4.0 | 5.5 | |
| W-25 | 7.6 | 5.2 | 6.7 | 8.6 | 7.2 +/- 2.4 |
| W-57 | 8.3 | 6.1 | 6.8 | 8.2 | |
| W-26 | 4.1 | 1.6 | 2.8 | 3.5 | 3.1 +/- 1.9 |
| W-58 | 3.4 | 2.3 | 2.6 | 4.4 | |
| WNW-27 | 3.7 | 2.7 | 4.5 | 3.5 | 3.7 +/- 1.4 |
| WNW-59 | 4.2 | 3.0 | 3.1 | 4.6 | |
| WNW-28 | 4.1 | 2.0 | 2.9 | 4.6 | 3.5 +/- 2.0 |
| WNW-60 | 4.1 | 2.5 | 2.8 | 4.6 | |
| NW-29 | 7.5 | 4.4 | 6.1 | 7.5 | 6.4 +/- 2.5 |
| NW-61 | 6.7 | 4.7 | 6.6 | 7.5 | |
| NW-30 | 2.7 | 1.0 | 2.2 | 3.3 | 2.2 +/- 1.7 |
| NW-62 | 2.4 | 0.9 | 2.0 | 2.8 | |
| NNW-31 | 4.5 | 2.2 | 3.7 | 5.1 | 3.6 +/- 2.0 |
| NNW-63 | 3.6 | 2.3 | 3.1 | 4.2 | |
| NNW-32 | 4.5 | 2.7 | 3.5 | 5.2 | 4.0 +/- 2.0 |
| NNW-64 | 3.5 | 2.9 | 3.9 | 5.5 | |
| Mean | | | | | 5.3 +/- 4.8 |

*Average of collocated TLDs.

**TABLE 3-2**
**DIRECT RADIATION MEASURMENTS – PRE-OPERATIONAL LOCATIONS**
**& EMERGENCY SECTOR**
**QUARTERLY TLD RESULTS**
**mR/Std. Month (30.4 days) ± 2 Sigma**



| Station | First Quarter 12/29/2009 03/31/2010 | Second Quarter 03/31/2010 06/30/2010 | Third Quarter 06/30/2010 09/28/2010 | Fourth Quarter 09/28/2010 12/28/2010 | Quarterly* Average +/- 2 s.d. |
|---|---|---|---|---|---|
| C-1 | 3.1 | 2.0 | 3.0 | 3.7 | 2.9 +/- 1.3 |
| C-2 | 3.1 | 2.0 | 2.7 | 3.6 | |
| C-3** | 3.4 | 2.6 | 3.0 | 4.9 | 3.4 +/- 1.5 |
| C-4** | 3.5 | 2.5 | 3.4 | 3.5 | |
| C-5 | 2.5 | 1.7 | 1.7 | 3.0 | 2.3 +/- 1.0 |
| C-6 | 2.1 | 2.0 | 2.1 | 3.0 | |
| C-7** | 3.6 | 2.6 | 3.1 | 3.9 | 3.4 +/- 1.7 |
| C-8** | 3.6 | 2.3 | 3.1 | 5.1 | |
| | | | | Mean Indicator | 2.6 +/- 0.7 |
| | | | | Control** | 3.4 +/- 0.8 |
| EPSA-01*** | 5.4 | 4.1 | 4.8 | 6.4 | 5.2 +/- 2.0 |
| EPSA-02*** | 5.8 | 3.9 | 4.8 | 6.6 | |
| EPSF-03*** | 4.7 | 4.3 | 4.2 | 6.4 | 4.5 +/- 1.9 |
| EPSF-04*** | 4.5 | 2.9 | 4.1 | 4.7 | |
| EPSR-05*** | 5.8 | 4.6 | 4.6 | 5.8 | 5.0 +/- 1.2 |
| EPSR-06*** | 4.2 | 4.6 | 5.5 | 4.9 | |
| EPSJ-07*** | 6.0 | 3.3 | 3.1 | 4.7 | 4.5 +/- 2.4 |
| EPSJ-08*** | 5.7 | 3.0 | 4.9 | 5.2 | |
| EPSP-09*** | 8.2 | 5.1 | 6.9 | 9.3 | 7.5 +/- 2.7 |
| EPSP-10*** | 7.6 | 6.8 | 7.1 | 9.0 | |
| Mean | | | | | 5.3 +/- 1.5 |

*Average of collocated TLDs.
** Control Station
*** Emergency Plan TLDs.

**TABLE 3-2**

**DIRECT RADIATION MEASURMENTS - ENVIRONMENTAL QUARTERLY TLD RESULTS**

**mR/Std. Month (30.4 days) ± 2 Sigma**



| Station | First Quarter 12/29/2009 03/31/2010 | Second Quarter 03/31/2010 06/30/2010 | Third Quarter 06/30/2010 09/28/2010 | Fourth Quarter 09/28/2010 12/28/2010 | Quarterly Average +/- 2 s.d. | Annual TLD |
|---|---|---|---|---|---|---|
| STA-01 | 5.7 | 3.9 | 4.5 | 6..4 | 4.7 +/- 1.8 | 5.1 |
| STA-02 | 2.2 | 1.9 | 2.7 | 3.0 | 2.5 +/- 1.0 | 2.3 |
| STA-03 | 2.3 | 1.5 | 2.0 | 2.8 | 2.2 +/- 1.1 | 2.2 |
| STA-04 | 2.9 | 2.6 | 1.9 | 3.8 | 2.8 +/- 1.6 | 2.3 |
| STA-05 | 3.3 | 1.9 | 3.4 | 3.6 | 3.1 +/- 1.6 | 3.8 |
| STA-05A | 3.4 | 2.0 | 4.7 | 4.7 | 3.7 +/- 2.6 | 2.9 |
| STA-06 | 4.2 | 2.8 | 4.6 | 5.8 | 4.4 +/- 2.5 | 4.2 |
| STA-07 | 2.9 | 2.0 | 2.6 | 3.7 | 2.8 +/- 1.4 | 3.0 |
| STA-21 | 2.2 | 2.0 | 2.8 | 4.4 | 2.9 +/- 2.2 | 2.6 |
| STA-22 | 4.2 | 3.0 | 4.2 | 5.4 | 4.2 +/- 2.0 | 4.1 |
| STA-23 | 4.6 | 4.2 | 4.4 | 6.2 | 4.9 +/- 1.8 | 4.7 |
| STA-24* | 3.1 | 2.0 | 3.3 | 4.9 | 3.3 +/- 1.2 | 2.6 |
| | | | Mean - Indicator Locations | | 3.4 +/- 1.2 | 3.4 +/- 2.1 |

*Control

# Table 3-3

## Air Particulate
## Gross Beta Radioactivity
## [$10^{-3}$ pCi/$m^3$]



| Period Ending | Station 01 | | | Station 02 | | | Station 03 | | | Station 04 | | | Station 05 | | | Station 06 | | | Station 07 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01/05/10 | 1.22E+01 | +/- | 2.63E+00 | 1.74E+01 | +/- | 2.94E+00 | 1.35E+01 | +/- | 2.73E+00 | 1.56E+01 | +/- | 2.85E+00 | 1.58E+01 | +/- | 2.85E+00 | 1.62E+01 | +/- | 2.87E+00 | 1.58E+01 | +/- | 2.85E+00 |
| 01/12/10 | 1.60E+01 | +/- | 2.79E+00 | 1.55E+01 | +/- | 2.76E+00 | 1.36E+01 | +/- | 2.64E+00 | 1.76E+01 | +/- | 2.86E+00 | 1.48E+01 | +/- | 2.71E+00 | 1.60E+01 | +/- | 2.78E+00 | 1.20E+01 | +/- | 2.56E+00 |
| 01/19/10 | 2.27E+01 | +/- | 3.66E+00 | 2.55E+01 | +/- | 3.76E+00 | 2.41E+01 | +/- | 3.72E+00 | 2.18E+01 | +/- | 3.62E+00 | 1.97E+01 | +/- | 3.53E+00 | 1.55E+01 | +/- | 3.35E+00 | 2.06E+01 | +/- | 3.57E+00 |
| 01/28/10 | 1.73E+01 | +/- | 3.39E+00 | 2.19E+01 | +/- | 3.60E+00 | 1.70E+01 | +/- | 3.37E+00 | 1.48E+01 | +/- | 3.29E+00 | 1.72E+01 | +/- | 3.40E+00 | 1.29E+01 | +/- | 3.20E+00 | 1.32E+01 | +/- | 3.22E+00 |
| 02/05/10 | 1.99E+01 | +/- | 3.45E+00 | 2.06E+01 | +/- | 3.48E+00 | 1.99E+01 | +/- | 3.47E+00 | 1.89E+01 | +/- | 3.42E+00 | 1.74E+01 | +/- | 3.35E+00 | 1.14E+01 | +/- | 3.08E+00 | 1.94E+01 | +/- | 3.45E+00 |
| 02/09/10 | 1.61E+01 | +/- | 3.63E+00 | 1.12E+01 | +/- | 3.53E+00 | 1.52E+01 | +/- | 3.94E+00 | 1.17E+01 | +/- | 3.48E+00 | 1.45E+01 | +/- | 3.54E+00 | 1.01E+01 | +/- | 3.99E+00 | 1.39E+01 | +/- | 3.52E+00 |
| 02/16/10 | 1.35E+01 | +/- | 3.10E+00 | 1.99E+01 | +/- | 3.36E+00 | 1.03E+01 | +/- | 2.98E+00 | 1.19E+01 | +/- | 3.04E+00 | 1.45E+01 | +/- | 3.15E+00 | 1.23E+01 | +/- | 3.04E+00 | 7.37E+00 | +/- | 2.78E+00 |
| 02/23/10 | 1.23E+01 | +/- | 2.46E+00 | 9.32E+00 | +/- | 2.33E+00 | 1.28E+01 | +/- | 2.57E+00 | 1.17E+01 | +/- | 2.47E+00 | 1.09E+01 | +/- | 2.42E+00 | 1.15E+01 | +/- | 2.46E+00 | 8.95E+00 | +/- | 2.30E+00 |
| 03/02/10 | 8.00E+00 | +/- | 2.48E+00 | 9.95E+00 | +/- | 2.58E+00 | 7.59E+00 | +/- | 2.35E+00 | 8.66E+00 | +/- | 2.46E+00 | 7.16E+00 | +/- | 2.38E+00 | 7.09E+00 | +/- | 2.38E+00 | 6.23E+00 | +/- | 2.34E+00 |
| 03/09/10 | 1.39E+01 | +/- | 2.46E+00 | 1.66E+01 | +/- | 2.78E+00 | 1.32E+01 | +/- | 2.60E+00 | 1.41E+01 | +/- | 2.64E+00 | 1.31E+01 | +/- | 2.59E+00 | 1.59E+01 | +/- | 2.74E+00 | 1.33E+01 | +/- | 2.60E+00 |
| 03/16/10 | 1.18E+01 | +/- | 3.19E+00 | 1.56E+01 | +/- | 3.34E+00 | 8.89E+00 | +/- | 3.01E+00 | 7.28E+00 | +/- | 2.94E+00 | 1.12E+01 | +/- | 3.13E+00 | 5.35E+00 | +/- | 2.48E+00 | 4.83E+00 | +/- | 2.82E+00 |
| 03/23/10 | 1.66E+01 | +/- | 3.49E+00 | 2.13E+01 | +/- | 3.65E+00 | 1.21E+01 | +/- | 3.38E+00 | 1.22E+01 | +/- | 3.34E+00 | 1.46E+01 | +/- | 5.66E+00 | 1.30E+01 | +/- | 3.34E+00 | 1.77E+01 | +/- | 3.53E+00 |
| 03/31/10 | 1.28E+01 | +/- | 2.49E+00 | 1.80E+01 | +/- | 2.75E+00 | 9.49E+00 | +/- | 2.26E+00 | 1.21E+01 | +/- | 2.42E+00 | | < | | 9.93E+00 | +/- | 2.33E+00 | 1.14E+01 | +/- | 2.41E+00 |
| 04/06/10 | 1.02E+01 | +/- | 3.72E+00 | 1.81E+01 | +/- | 4.10E+00 | 1.15E+01 | +/- | 3.79E+00 | 1.04E+01 | +/- | 3.83E+00 | 9.38E+00 | +/- | 4.46E+00 | 7.57E+00 | +/- | 2.51E+00 | 9.03E+00 | +/- | 3.70E+00 |
| 04/14/10 | 1.74E+01 | +/- | 3.03E+00 | 2.04E+01 | +/- | 3.16E+00 | 1.46E+01 | +/- | 2.91E+00 | 1.46E+01 | +/- | 2.90E+00 | 1.13E+01 | +/- | 5.99E+00 | 1.80E+01 | +/- | 3.05E+00 | 2.10E+01 | +/- | 3.18E+00 |
| 04/20/10 | 1.54E+01 | +/- | 3.14E+00 | 2.04E+01 | +/- | 3.39E+00 | 1.68E+01 | +/- | 3.20E+00 | 1.60E+01 | +/- | 3.17E+00 | 1.56E+01 | +/- | 4.38E+00 | 1.41E+01 | +/- | 3.06E+00 | 1.54E+01 | +/- | 3.13E+00 |
| 04/27/10 | 1.85E+01 | +/- | 3.27E+00 | 2.65E+01 | +/- | 3.62E+00 | 1.64E+01 | +/- | 3.19E+00 | 1.41E+01 | +/- | 3.08E+00 | 2.11E+01 | +/- | 3.40E+00 | 1.83E+01 | +/- | 3.27E+00 | 1.58E+01 | +/- | 3.16E+00 |
| 05/04/10 | 1.72E+01 | +/- | 3.32E+00 | 2.20E+01 | +/- | 3.52E+00 | 1.52E+01 | +/- | 3.23E+00 | 1.84E+01 | +/- | 3.37E+00 | 1.61E+01 | +/- | 3.27E+00 | 1.40E+01 | +/- | 3.17E+00 | 1.56E+01 | +/- | 3.24E+00 |
| 05/11/10 | 1.69E+01 | +/- | 3.18E+00 | 2.20E+01 | +/- | 3.40E+00 | 1.26E+01 | +/- | 2.96E+00 | 1.88E+01 | +/- | 3.26E+00 | 1.55E+01 | +/- | 3.10E+00 | 1.73E+01 | +/- | 3.19E+00 | 2.02E+01 | +/- | 3.32E+00 |
| 05/19/10 | 9.67E+00 | +/- | 2.31E+00 | 1.33E+01 | +/- | 2.48E+00 | 8.67E+00 | +/- | 2.27E+00 | 9.86E+00 | +/- | 2.32E+00 | 1.12E+01 | +/- | 2.36E+00 | 9.19E+00 | +/- | 2.26E+00 | 9.40E+00 | +/- | 2.66E+00 |
| 05/25/10 | 8.25E+00 | +/- | 3.37E+00 | 1.64E+01 | +/- | 3.91E+00 | 9.80E+00 | +/- | 3.42E+00 | 1.14E+01 | +/- | 3.54E+00 | 1.26E+01 | +/- | 3.66E+00 | 1.13E+01 | +/- | 3.60E+00 | 9.86E+00 | +/- | 3.52E+00 |
| 06/02/10 | 1.19E+01 | +/- | 2.92E+00 | 1.32E+01 | +/- | 2.97E+00 | 8.76E+00 | +/- | 2.79E+00 | 1.42E+01 | +/- | 3.04E+00 | 1.44E+01 | +/- | 3.05E+00 | 1.13E+01 | +/- | 2.91E+00 | 1.18E+01 | +/- | 2.92E+00 |
| 06/08/10 | 1.65E+01 | +/- | 3.78E+00 | 1.58E+01 | +/- | 3.73E+00 | 1.65E+01 | +/- | 3.74E+00 | 1.56E+01 | +/- | 3.70E+00 | 1.78E+01 | +/- | 3.80E+00 | 1.35E+01 | +/- | 3.60E+00 | 1.41E+01 | +/- | 3.63E+00 |
| 06/15/10 | 1.12E+01 | +/- | 2.69E+00 | 1.33E+01 | +/- | 2.80E+00 | 1.84E+01 | +/- | 3.06E+00 | 1.40E+01 | +/- | 2.85E+00 | 1.36E+01 | +/- | 2.83E+00 | 1.49E+01 | +/- | 2.89E+00 | 1.72E+01 | +/- | 3.00E+00 |
| 06/22/10 | 1.61E+01 | +/- | 3.43E+00 | 1.28E+01 | +/- | 3.30E+00 | 2.10E+01 | +/- | 3.64E+00 | 9.54E+00 | +/- | 3.15E+00 | 1.47E+01 | +/- | 3.38E+00 | 1.26E+01 | +/- | 3.29E+00 | 1.63E+01 | +/- | 3.45E+00 |
| 06/29/10 | 2.14E+01 | +/- | 3.64E+00 | 2.25E+01 | +/- | 3.67E+00 | 1.70E+01 | +/- | 3.45E+00 | 1.76E+01 | +/- | 3.47E+00 | 1.70E+01 | +/- | 3.44E+00 | 1.35E+01 | +/- | 3.29E+00 | 1.94E+01 | +/- | 3.55E+00 |

# Table 3-3
## Air Particulate
## Gross Beta Radioactivity
## [$10^{-3}$ pCi/$m^3$]



| Period Ending | Station 21 | | | Station 22 | | | Station 23 | | | Station 24* | | | Station 01A | | | Station 05A | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01/05/10 | 1.34E+01 | +/- | 2.72E+00 | 1.65E+01 | +/- | 2.88E+00 | 1.36E+01 | +/- | 2.73E+00 | 1.75E+01 | +/- | 2.94E+00 | 1.20E+01 | +/- | 2.63E+00 | 1.53E+01 | +/- | 2.82E+00 |
| 01/12/10 | 1.24E+01 | +/- | 2.58E+00 | 1.44E+01 | +/- | 2.70E+00 | 1.44E+01 | +/- | 2.70E+00 | 1.31E+01 | +/- | 2.62E+00 | 8.03E+00 | +/- | 2.32E+00 | 1.51E+01 | +/- | 2.73E+00 |
| 01/19/10 | 1.48E+01 | +/- | 3.32E+00 | 1.77E+01 | +/- | 3.45E+00 | 2.51E+01 | +/- | 3.75E+00 | 2.05E+01 | +/- | 3.56E+00 | 1.97E+01 | +/- | 3.53E+00 | 1.96E+01 | +/- | 3.53E+00 |
| 01/28/10 | 9.44E+00 | +/- | 3.04E+00 | 1.81E+01 | +/- | 3.42E+00 | 1.69E+01 | +/- | 3.38E+00 | 1.83E+01 | +/- | 3.44E+00 | 1.55E+01 | +/- | 3.31E+00 | 1.65E+01 | +/- | 3.36E+00 |
| 02/05/10 | 1.55E+01 | +/- | 3.26E+00 | 2.00E+01 | +/- | 3.46E+00 | 1.43E+01 | +/- | 3.20E+00 | 1.99E+01 | +/- | 3.46E+00 | 1.47E+01 | +/- | 3.22E+00 | 1.48E+01 | +/- | 3.24E+00 |
| 02/09/10 | 7.92E+00 | +/- | 3.40E+00 | 1.39E+01 | +/- | 4.14E+00 | 1.06E+01 | +/- | 3.60E+00 | 1.87E+01 | +/- | 3.71E+00 | 1.12E+01 | +/- | 3.67E+00 | 1.22E+01 | +/- | 3.44E+00 |
| 02/16/10 | 1.34E+01 | +/- | 3.05E+00 | 1.53E+01 | +/- | 3.18E+00 | 1.46E+01 | +/- | 3.11E+00 | 1.32E+01 | +/- | 3.12E+00 | 1.29E+01 | +/- | 3.07E+00 | 1.21E+01 | +/- | 3.04E+00 |
| 02/23/10 | 9.91E+00 | +/- | 2.36E+00 | 1.21E+01 | +/- | 2.46E+00 | 1.24E+01 | +/- | 2.52E+00 | 1.44E+01 | +/- | 2.63E+00 | 1.05E+01 | +/- | 2.36E+00 | 9.98E+00 | +/- | 2.37E+00 |
| 03/02/10 | 5.18E+00 | +/- | 2.29E+00 | 8.71E+00 | +/- | 2.51E+00 | 5.61E+00 | +/- | 2.31E+00 | 9.55E+00 | +/- | 2.50E+00 | 7.61E+00 | +/- | 2.45E+00 | 6.76E+00 | +/- | 2.35E+00 |
| 03/09/10 | 1.47E+01 | +/- | 2.68E+00 | 1.58E+01 | +/- | 2.74E+00 | 1.46E+01 | +/- | 2.68E+00 | 1.87E+01 | +/- | 2.89E+00 | 1.72E+01 | +/- | 2.82E+00 | 1.56E+01 | +/- | 2.73E+00 |
| 03/16/10 | 8.94E+00 | +/- | 3.03E+00 | 1.10E+01 | +/- | 3.13E+00 | 9.01E+00 | +/- | 3.03E+00 | 1.06E+01 | +/- | 3.11E+00 | 6.67E+00 | +/- | 2.94E+00 | 7.58E+00 | +/- | 2.96E+00 |
| 03/23/10 | 1.30E+01 | +/- | 3.36E+00 | 1.70E+01 | +/- | 3.52E+00 | 1.48E+01 | +/- | 3.39E+00 | 1.67E+01 | +/- | 3.54E+00 | 1.76E+01 | +/- | 3.55E+00 | 1.56E+01 | +/- | 3.46E+00 |
| 03/31/10 | 1.22E+01 | +/- | 2.47E+00 | 1.46E+01 | +/- | 2.57E+00 | 9.96E+00 | +/- | 2.37E+00 | 1.41E+01 | +/- | 2.52E+00 | 1.41E+01 | +/- | 2.59E+00 | 8.53E+00 | +/- | 2.24E+00 |
| 04/06/10 | 9.55E+00 | +/- | 3.73E+00 | 9.95E+00 | +/- | 3.73E+00 | 1.05E+01 | +/- | 3.66E+00 | 1.47E+01 | +/- | 3.95E+00 | 1.03E+01 | +/- | 3.73E+00 | 1.61E+01 | +/- | 4.08E+00 |
| 04/14/10 | 1.68E+01 | +/- | 3.00E+00 | 1.87E+01 | +/- | 3.09E+00 | 1.71E+01 | +/- | 3.07E+00 | 2.10E+01 | +/- | 3.19E+00 | 1.78E+01 | +/- | 3.04E+00 | 1.73E+01 | +/- | 3.02E+00 |
| 04/20/10 | 1.46E+01 | +/- | 3.10E+00 | 1.59E+01 | +/- | 3.17E+00 | 1.35E+01 | +/- | 3.02E+00 | 1.80E+01 | +/- | 3.27E+00 | 1.55E+01 | +/- | 3.15E+00 | 1.33E+01 | +/- | 3.01E+00 |
| 04/27/10 | 1.91E+01 | +/- | 3.29E+00 | 2.13E+01 | +/- | 3.39E+00 | 2.09E+01 | +/- | 3.39E+00 | 2.17E+01 | +/- | 3.42E+00 | 1.93E+01 | +/- | 3.31E+00 | 1.77E+01 | +/- | 3.25E+00 |
| 05/04/10 | 1.53E+01 | +/- | 3.24E+00 | 1.57E+01 | +/- | 3.25E+00 | 1.65E+01 | +/- | 3.28E+00 | 1.32E+01 | +/- | 3.13E+00 | 1.61E+01 | +/- | 3.27E+00 | 1.80E+01 | +/- | 3.35E+00 |
| 05/11/10 | 1.64E+01 | +/- | 3.15E+00 | 2.10E+01 | +/- | 4.97E+00 | 1.86E+01 | +/- | 3.25E+00 | 1.94E+01 | +/- | 3.28E+00 | 1.53E+01 | +/- | 3.11E+00 | 1.61E+01 | +/- | 3.13E+00 |
| 05/19/10 | 5.81E+00 | +/- | 2.04E+00 | 7.84E+00 | +/- | 2.24E+00 | 1.08E+01 | +/- | 2.33E+00 | 1.21E+01 | +/- | 2.46E+00 | 7.93E+00 | +/- | 2.21E+00 | 1.09E+01 | +/- | 2.34E+00 |
| 05/25/10 | 1.00E+01 | +/- | 3.55E+00 | 9.39E+00 | +/- | 3.52E+00 | 1.11E+01 | +/- | 3.60E+00 | 1.21E+01 | +/- | 3.52E+00 | 7.56E+00 | +/- | 3.34E+00 | 1.08E+01 | +/- | 3.58E+00 |
| 06/02/10 | 1.05E+01 | +/- | 2.86E+00 | 1.24E+01 | +/- | 3.13E+00 | 1.17E+01 | +/- | 2.91E+00 | 1.76E+01 | +/- | 3.17E+00 | 5.33E+00 | +/- | 2.80E+00 | 1.30E+01 | +/- | 2.99E+00 |
| 06/08/10 | 1.45E+01 | +/- | 3.71E+00 | 7.18E+00 | +/- | 3.32E+00 | 1.30E+01 | +/- | 3.63E+00 | 1.81E+01 | +/- | 3.81E+00 | 1.50E+01 | +/- | 3.71E+00 | 1.38E+01 | +/- | 3.61E+00 |
| 06/15/10 | 1.01E+01 | +/- | 2.62E+00 | 1.02E+01 | +/- | 2.63E+00 | 1.45E+01 | +/- | 2.85E+00 | 1.93E+01 | +/- | 3.11E+00 | 1.40E+01 | +/- | 2.83E+00 | 1.07E+01 | +/- | 2.67E+00 |
| 06/22/10 | 1.33E+01 | +/- | 3.31E+00 | 1.33E+01 | +/- | 3.31E+00 | 1.04E+01 | +/- | 3.19E+00 | 1.17E+01 | +/- | 3.24E+00 | 1.02E+01 | +/- | 3.17E+00 | 1.70E+01 | +/- | 3.48E+00 |
| 06/29/10 | 2.11E+01 | +/- | 3.61E+00 | 1.63E+01 | +/- | 3.41E+00 | 1.50E+01 | +/- | 3.36E+00 | 1.92E+01 | +/- | 3.54E+00 | 1.85E+01 | +/- | 3.52E+00 | 1.75E+01 | +/- | 3.46E+00 |

* Control Station

# Table 3-3
## Air Particulate
## Gross Beta Radioactivity
## [$10^{-3}$ pCi/$m^3$]



| Period Ending | Station 01 | | | Station 02 | | | Station 03 | | | Station 04 | | | Station 05 | | | Station 06 | | | Station 07 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 07/06/10 | 1.61E+01 | +/- | 2.91E+00 | 1.89E+01 | +/- | 3.06E+00 | 1.57E+01 | +/- | 2.90E+00 | 1.62E+01 | +/- | 2.94E+00 | 1.95E+01 | +/- | 3.10E+00 | 1.80E+01 | +/- | 3.02E+00 | 1.18E+01 | +/- | 2.71E+00 |
| 07/13/10 | 2.96E+01 | +/- | 3.46E+00 | 3.35E+01 | +/- | 3.61E+00 | 2.42E+01 | +/- | 3.22E+00 | 2.85E+01 | +/- | 3.39E+00 | 3.01E+01 | +/- | 3.46E+00 | 2.20E+01 | +/- | 3.10E+00 | 2.49E+01 | +/- | 3.24E+00 |
| 07/21/10 | 2.63E+01 | +/- | 3.54E+00 | 2.91E+01 | +/- | 3.63E+00 | 1.36E+01 | +/- | 3.04E+00 | 2.07E+01 | +/- | 3.33E+00 | 2.00E+01 | +/- | 3.30E+00 | 1.75E+01 | +/- | 3.20E+00 | 1.46E+01 | +/- | 3.08E+00 |
| 07/27/10 | 1.62E+01 | +/- | 3.15E+00 | 2.51E+01 | +/- | 3.61E+00 | 1.56E+01 | +/- | 3.14E+00 | 1.84E+01 | +/- | 3.29E+00 | 1.52E+01 | +/- | 3.12E+00 | 1.73E+01 | +/- | 3.23E+00 | 1.61E+01 | +/- | 3.17E+00 |
| 08/04/10 | 1.76E+01 | +/- | 3.08E+00 | 2.50E+01 | +/- | 3.38E+00 | 1.31E+01 | +/- | 2.90E+00 | 1.69E+01 | +/- | 3.05E+00 | 1.69E+01 | +/- | 3.05E+00 | 1.40E+01 | +/- | 2.92E+00 | 1.71E+01 | +/- | 3.06E+00 |
| 08/12/10 | 2.37E+01 | +/- | 3.53E+00 | 2.93E+01 | +/- | 3.78E+00 | 2.00E+01 | +/- | 3.32E+00 | 2.04E+01 | +/- | 3.34E+00 | 2.53E+01 | +/- | 3.58E+00 | 2.41E+01 | +/- | 3.53E+00 | 2.18E+01 | +/- | 3.42E+00 |
| 08/18/10 | 2.23E+01 | +/- | 3.20E+00 | 3.06E+01 | +/- | 3.51E+00 | 2.10E+01 | +/- | 3.13E+00 | 2.41E+01 | +/- | 3.27E+00 | 2.68E+01 | +/- | 3.38E+00 | 1.86E+01 | +/- | 3.04E+00 | 2.06E+01 | +/- | 3.12E+00 |
| 08/24/10 | 2.43E+01 | +/- | 3.69E+00 | 2.09E+01 | +/- | 3.62E+00 | 2.22E+01 | +/- | 3.56E+00 | 2.11E+01 | +/- | 3.50E+00 | 2.74E+01 | +/- | 3.79E+00 | 2.61E+01 | +/- | 3.76E+00 | 2.15E+01 | +/- | 3.53E+00 |
| 08/31/10 | 2.35E+01 | +/- | 3.53E+00 | 1.93E+01 | +/- | 3.40E+00 | 2.05E+01 | +/- | 3.44E+00 | 1.92E+01 | +/- | 3.40E+00 | 2.38E+01 | +/- | 3.60E+00 | 2.23E+01 | +/- | 3.52E+00 | 2.41E+01 | +/- | 3.60E+00 |
| 09/07/10 | 2.64E+01 | +/- | 3.57E+00 | 2.86E+01 | +/- | 3.63E+00 | 2.47E+01 | +/- | 3.47E+00 | 2.53E+01 | +/- | 3.49E+00 | 3.36E+01 | +/- | 3.83E+00 | 3.20E+01 | +/- | 3.77E+00 | 2.67E+01 | +/- | 3.56E+00 |
| 09/14/10 | 2.55E+01 | +/- | 3.51E+00 | 2.04E+01 | +/- | 3.31E+00 | 2.23E+01 | +/- | 3.41E+00 | 2.20E+01 | +/- | 3.40E+00 | 2.17E+01 | +/- | 3.38E+00 | 1.62E+01 | +/- | 3.12E+00 | 2.00E+01 | +/- | 3.30E+00 |
| 09/21/10 | 2.38E+01 | +/- | 3.56E+00 | 2.03E+01 | +/- | 3.38E+00 | 2.29E+01 | +/- | 3.59E+00 | 2.69E+01 | +/- | 3.72E+00 | 2.21E+01 | +/- | 3.49E+00 | 2.20E+01 | +/- | 3.48E+00 | 2.55E+01 | +/- | 3.61E+00 |
| 09/28/10 | 3.05E+01 | +/- | 3.54E+00 | 2.53E+01 | +/- | 3.34E+00 | 2.61E+01 | +/- | 3.27E+00 | 3.04E+01 | +/- | 3.48E+00 | 2.77E+01 | +/- | 3.40E+00 | 2.41E+01 | +/- | 3.25E+00 | 2.35E+01 | +/- | 3.24E+00 |
| 10/06/10 | 1.12E+01 | +/- | 2.60E+00 | 8.55E+00 | +/- | 2.46E+00 | 1.10E+01 | +/- | 2.66E+00 | 9.35E+00 | +/- | 2.55E+00 | 1.02E+01 | +/- | 2.57E+00 | 8.81E+00 | +/- | 2.50E+00 | 1.12E+01 | +/- | 2.61E+00 |
| 10/12/10 | 3.42E+01 | +/- | 4.42E+00 | 2.43E+01 | +/- | 3.99E+00 | 1.75E+01 | +/- | 3.70E+00 | 3.31E+01 | +/- | 4.37E+00 | 2.79E+01 | +/- | 4.15E+00 | 2.89E+01 | +/- | 4.18E+00 | 2.69E+01 | +/- | 4.10E+00 |
| 10/19/10 | 2.12E+01 | +/- | 3.22E+00 | 1.31E+01 | +/- | 2.83E+00 | 1.53E+01 | +/- | 2.93E+00 | 1.79E+01 | +/- | 3.06E+00 | 2.41E+01 | +/- | 3.35E+00 | 1.70E+01 | +/- | 3.03E+00 | 1.32E+01 | +/- | 2.83E+00 |
| 10/26/10 | 1.80E+01 | +/- | 3.22E+00 | 1.79E+01 | +/- | 3.26E+00 | 1.83E+01 | +/- | 3.19E+00 | 1.65E+01 | +/- | 3.13E+00 | 2.43E+01 | +/- | 3.51E+00 | 2.01E+01 | +/- | 3.34E+00 | 1.74E+01 | +/- | 3.22E+00 |
| 11/02/10 | 1.51E+01 | +/- | 3.11E+00 | 9.87E+00 | +/- | 2.84E+00 | 1.26E+01 | +/- | 2.99E+00 | 1.30E+01 | +/- | 3.00E+00 | 1.53E+01 | +/- | 3.11E+00 | 1.47E+01 | +/- | 3.08E+00 | 1.18E+01 | +/- | 2.84E+00 |
| 11/09/10 | 1.27E+01 | +/- | 3.00E+00 | 9.28E+01 | +/- | 2.83E+00 | 1.17E+01 | +/- | 2.94E+00 | 1.26E+01 | +/- | 2.99E+00 | 1.38E+01 | +/- | 3.05E+00 | 8.89E+00 | +/- | 2.80E+00 | 7.93E+00 | +/- | 2.75E+00 |
| 11/16/10 | 1.98E+01 | +/- | 2.61E+00 | 1.71E+01 | +/- | 2.45E+00 | 1.77E+01 | +/- | 2.53E+00 | 2.17E+01 | +/- | 2.73E+00 | 2.29E+01 | +/- | 2.78E+00 | 1.88E+01 | +/- | 2.56E+00 | 2.00E+01 | +/- | 2.63E+00 |
| 11/23/10 | 2.36E+01 | +/- | 3.20E+00 | 2.78E+01 | +/- | 3.37E+00 | 2.13E+01 | +/- | 3.11E+00 | 2.31E+01 | +/- | 3.19E+00 | 3.09E+01 | +/- | 3.52E+00 | 2.96E+01 | +/- | 3.46E+00 | 3.13E+01 | +/- | 3.53E+00 |
| 11/30/10 | 1.46E+01 | +/- | 2.58E+00 | 1.50E+01 | +/- | 2.62E+00 | 2.01E+01 | +/- | 2.83E+00 | 1.91E+01 | +/- | 2.80E+00 | 1.54E+01 | +/- | 2.62E+00 | 1.39E+01 | +/- | 2.55E+00 | 1.80E+01 | +/- | 2.78E+00 |
| 12/07/10 | 1.28E+01 | +/- | 3.03E+00 | 1.12E+01 | +/- | 2.96E+00 | 8.46E+00 | +/- | 2.82E+00 | 1.24E+01 | +/- | 3.02E+00 | 1.43E+01 | +/- | 3.11E+00 | 1.21E+01 | +/- | 3.00E+00 | 1.20E+01 | +/- | 2.99E+00 |
| 12/14/10 | 1.73E+01 | +/- | 2.86E+00 | 1.80E+01 | +/- | 2.89E+00 | 1.65E+01 | +/- | 2.81E+00 | 1.84E+01 | +/- | 2.91E+00 | 2.16E+01 | +/- | 3.07E+00 | 1.80E+01 | +/- | 2.89E+00 | 1.74E+01 | +/- | 2.86E+00 |
| 12/21/10 | 2.12E+01 | +/- | 3.44E+00 | 1.34E+01 | +/- | 3.03E+00 | 2.06E+01 | +/- | 3.41E+00 | 2.08E+01 | +/- | 3.45E+00 | 2.25E+01 | +/- | 3.48E+00 | 2.19E+01 | +/- | 3.45E+00 | 2.05E+01 | +/- | 3.36E+00 |
| 12/28/10 | 1.08E+01 | +/- | 2.48E+00 | 1.07E+01 | +/- | 2.50E+00 | 1.01E+01 | +/- | 2.42E+00 | 1.22E+01 | +/- | 2.53E+00 | 1.53E+01 | +/- | 2.73E+00 | 1.25E+01 | +/- | 2.59E+00 | 9.55E+00 | +/- | 2.43E+00 |
| MEAN | 1.77E+01 | +/- | 3.17E+00 | 2.05E+01 | +/- | 3.23E+00 | 1.59E+01 | +/- | 3.10E+00 | 1.70E+01 | +/- | 3.15E+00 | 1.82E+01 | +/- | 3.30E+00 | 1.60E+01 | +/- | 3.09E+00 | 1.63E+01 | +/- | 3.12E+00 |

# Table 3-3

## Air Particulate
## Gross Beta Radioactivity
## [$10^{-3}$ pCi/$m^3$]



| Period Ending | Station 21 | | | Station 22 | | | Station 23 | | | Station 24* | | | Station 01A | | | Station 05A | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 07/06/10 | 1.49E+01 | +/- | 2.86E+00 | 1.49E+01 | +/- | 2.86E+00 | 1.88E+01 | +/- | 3.06E+00 | 1.78E+01 | +/- | 3.02E+00 | 1.56E+01 | +/- | 2.90E+00 | 1.43E+01 | +/- | 2.84E+00 |
| 07/13/10 | 2.35E+01 | +/- | 3.19E+00 | 2.57E+01 | +/- | 3.29E+00 | 2.16E+01 | +/- | 3.10E+00 | 3.06E+01 | +/- | 3.49E+00 | 2.49E+01 | +/- | 3.25E+00 | 2.73E+01 | +/- | 3.35E+00 |
| 07/21/10 | 1.77E+01 | +/- | 3.20E+00 | 2.35E+01 | +/- | 3.42E+00 | 1.94E+01 | +/- | 3.27E+00 | 2.21E+01 | +/- | 3.38E+00 | 2.01E+01 | +/- | 3.31E+00 | 2.23E+01 | +/- | 3.39E+00 |
| 07/27/10 | 1.80E+01 | +/- | 3.25E+00 | 1.88E+01 | +/- | 3.30E+00 | 1.90E+01 | +/- | 3.31E+00 | 2.06E+01 | +/- | 3.40E+00 | 1.55E+01 | +/- | 3.11E+00 | 1.66E+01 | +/- | 3.19E+00 |
| 08/04/10 | 1.20E+01 | +/- | 2.83E+00 | 1.50E+01 | +/- | 2.97E+00 | 1.53E+01 | +/- | 2.98E+00 | 2.14E+01 | +/- | 3.24E+00 | 1.61E+01 | +/- | 3.02E+00 | 1.64E+01 | +/- | 3.03E+00 |
| 08/12/10 | 2.06E+01 | +/- | 3.37E+00 | 2.35E+01 | +/- | 3.51E+00 | 2.50E+01 | +/- | 3.58E+00 | 2.33E+01 | +/- | 3.49E+00 | 2.40E+01 | +/- | 3.53E+00 | 2.24E+01 | +/- | 3.44E+00 |
| 08/18/10 | 2.21E+01 | +/- | 3.20E+00 | 2.45E+01 | +/- | 3.27E+00 | 2.34E+01 | +/- | 3.25E+00 | 2.66E+01 | +/- | 3.37E+00 | 2.05E+01 | +/- | 3.13E+00 | 2.10E+01 | +/- | 3.14E+00 |
| 08/24/10 | 2.15E+01 | +/- | 3.57E+00 | 2.42E+01 | +/- | 3.70E+00 | 2.18E+01 | +/- | 3.57E+00 | 2.59E+01 | +/- | 3.70E+00 | 1.87E+01 | +/- | 3.42E+00 | 2.62E+01 | +/- | 3.74E+00 |
| 08/31/10 | 1.97E+01 | +/- | 3.37E+00 | 2.29E+01 | +/- | 3.51E+00 | 2.22E+01 | +/- | 3.50E+00 | 2.72E+01 | +/- | 3.74E+00 | 1.92E+01 | +/- | 3.35E+00 | 2.82E+01 | +/- | 3.79E+00 |
| 09/07/10 | 2.77E+01 | +/- | 3.61E+00 | 3.00E+01 | +/- | 3.70E+00 | 3.44E+01 | +/- | 3.87E+00 | 3.60E+01 | +/- | 3.91E+00 | 2.87E+01 | +/- | 3.66E+00 | 3.30E+01 | +/- | 3.80E+00 |
| 09/14/10 | 1.46E+01 | +/- | 3.04E+00 | 2.20E+01 | +/- | 3.37E+00 | 1.91E+01 | +/- | 3.25E+00 | 2.81E+01 | +/- | 3.66E+00 | 1.99E+01 | +/- | 3.27E+00 | 2.08E+01 | +/- | 3.34E+00 |
| 09/21/10 | 2.66E+01 | +/- | 3.68E+00 | 2.44E+01 | +/- | 3.50E+00 | 1.38E+01 | +/- | 3.08E+00 | 2.91E+01 | +/- | 3.81E+00 | 2.35E+01 | +/- | 3.49E+00 | 2.62E+01 | +/- | 3.66E+00 |
| 09/28/10 | 2.55E+01 | +/- | 3.31E+00 | 2.55E+01 | +/- | 3.31E+00 | 2.15E+01 | +/- | 3.17E+00 | 3.27E+01 | +/- | 3.58E+00 | 2.07E+01 | +/- | 3.15E+00 | 2.74E+01 | +/- | 3.38E+00 |
| 10/06/10 | 8.85E+00 | +/- | 2.50E+00 | 9.44E+00 | +/- | 2.53E+00 | 6.46E+00 | +/- | 2.34E+00 | 1.25E+01 | +/- | 2.71E+00 | 9.41E+00 | +/- | 2.48E+00 | 1.16E+01 | +/- | 2.65E+00 |
| 10/12/10 | 2.13E+01 | +/- | 3.89E+00 | 3.07E+01 | +/- | 4.28E+00 | 3.26E+01 | +/- | 4.33E+00 | 3.34E+01 | +/- | 4.37E+00 | 3.37E+01 | +/- | 4.36E+00 | 3.20E+01 | +/- | 4.32E+00 |
| 10/19/10 | 2.05E+01 | +/- | 3.18E+00 | 2.27E+01 | +/- | 3.28E+00 | 1.85E+01 | +/- | 3.10E+00 | 2.44E+01 | +/- | 3.36E+00 | 1.59E+01 | +/- | 3.04E+00 | 1.60E+01 | +/- | 2.97E+00 |
| 10/26/10 | 2.50E+01 | +/- | 3.53E+00 | 1.65E+01 | +/- | 3.15E+00 | 2.25E+01 | +/- | 3.47E+00 | 1.97E+01 | +/- | 3.29E+00 | 2.25E+01 | +/- | 3.42E+00 | 1.75E+01 | +/- | 3.21E+00 |
| 11/02/10 | 1.03E+01 | +/- | 2.87E+00 | 1.65E+01 | +/- | 3.17E+00 | 1.31E+01 | +/- | 3.01E+00 | 1.41E+01 | +/- | 3.06E+00 | 1.23E+01 | +/- | 2.97E+00 | 1.44E+01 | +/- | 3.07E+00 |
| 11/09/10 | 1.07E+01 | +/- | 2.90E+00 | 7.93E+00 | +/- | 2.75E+00 | 1.17E+01 | +/- | 2.95E+00 | 1.20E+01 | +/- | 2.94E+00 | 1.03E+01 | +/- | 2.88E+00 | 1.11E+01 | +/- | 2.91E+00 |
| 11/16/10 | 1.55E+01 | +/- | 2.36E+00 | 2.01E+01 | +/- | 2.63E+00 | 2.15E+01 | +/- | 2.71E+00 | 2.42E+01 | +/- | 2.85E+00 | 2.42E+01 | +/- | 2.85E+00 | 2.47E+01 | +/- | 2.88E+00 |
| 11/23/10 | 2.14E+01 | +/- | 3.10E+00 | 2.42E+01 | +/- | 3.23E+00 | 2.31E+01 | +/- | 3.14E+00 | 4.10E+01 | +/- | 3.97E+00 | 2.11E+01 | +/- | 3.04E+00 | 2.38E+01 | +/- | 3.21E+00 |
| 11/30/10 | 2.12E+01 | +/- | 2.93E+00 | 1.96E+01 | +/- | 2.84E+00 | 1.69E+01 | +/- | 2.74E+00 | 1.89E+01 | +/- | 2.79E+00 | 1.90E+01 | +/- | 2.86E+00 | 2.67E+01 | +/- | 3.19E+00 |
| 12/07/10 | 7.91E+00 | +/- | 2.79E+00 | 1.18E+01 | +/- | 2.99E+00 | 1.12E+01 | +/- | 2.95E+00 | 1.37E+01 | +/- | 3.08E+00 | 1.24E+01 | +/- | 3.02E+00 | 1.23E+01 | +/- | 3.01E+00 |
| 12/14/10 | 1.50E+01 | +/- | 2.74E+00 | 2.20E+01 | +/- | 3.09E+00 | 1.13E+01 | +/- | 2.53E+00 | 2.45E+01 | +/- | 3.20E+00 | 1.29E+01 | +/- | 2.62E+00 | 1.55E+01 | +/- | 2.76E+00 |
| 12/21/10 | 2.17E+01 | +/- | 3.46E+00 | 2.28E+01 | +/- | 3.51E+00 | 2.06E+01 | +/- | 3.34E+00 | 2.55E+01 | +/- | 3.64E+00 | 2.40E+01 | +/- | 3.56E+00 | 2.25E+01 | +/- | 3.49E+00 |
| 12/28/10 | 1.04E+01 | +/- | 2.45E+00 | 1.40E+01 | +/- | 2.66E+00 | 1.04E+01 | +/- | 2.50E+00 | 1.31E+01 | +/- | 2.58E+00 | 1.02E+01 | +/- | 2.45E+00 | 1.11E+01 | +/- | 2.49E+00 |
| MEAN | 1.54E+01 | +/- | 3.08E+00 | 1.75E+01 | +/- | 3.21E+00 | 1.64E+01 | +/- | 3.12E+00 | 2.00E+01 | +/- | 3.28E+00 | 1.61E+01 | +/- | 3.11E+00 | 1.74E+01 | +/- | 3.16E+00 |
| | | | | | | | | | | | | | Mean - All Indicator Locations | | | 1.70E+01 | +/- | 3.15E+00 |

* Control Station

# Table 3-4

## Airborne Iodine

## I-131

[$10^{-3}$ pCi/$m^3$]



| Period Ending | Station 01 | Station 02 | Station 03 | Station 04 | Station 05 | Station 06 | Station 07 |
|---|---|---|---|---|---|---|---|
| 01/05/10 | < 3.65E+01 | < 3.70E+01 | < 3.70E+01 | < 2.04E+01 | < 3.70E+01 | < 3.94E+01 | < 3.94E+01 |
| 01/12/10 | < 2.66E+01 | < 2.66E+01 | < 2.64E+01 | < 2.65E+01 | < 2.99E+01 | < 2.99E+01 | < 2.99E+01 |
| 01/19/10 | < 1.48E+01 | < 2.69E+01 | < 2.70E+01 | < 2.69E+01 | < 2.69E+01 | < 1.05E+01 | < 2.47E+01 |
| 01/28/10 | < 1.44E+01 | < 2.62E+01 | < 2.60E+01 | < 2.62E+01 | < 2.62E+01 | < 3.66E+01 | < 3.66E+01 |
| 02/05/10 | < 4.98E+00 | < 9.03E+00 | < 9.09E+00 | < 9.07E+00 | < 9.07E+00 | < 4.59E+00 | < 1.08E+01 |
| 02/09/10 | < 9.24E+00 | < 5.28E+00 | < 1.04E+01 | < 9.37E+00 | < 9.18E+00 | < 1.27E+01 | < 1.04E+01 |
| 02/16/10 | < 4.78E+00 | < 8.73E+00 | < 8.97E+00 | < 8.91E+00 | < 8.86E+00 | < 9.68E+00 | < 9.64E+00 |
| 02/23/10 | < 1.93E+01 | < 1.98E+01 | < 1.11E+01 | < 1.98E+01 | < 1.98E+01 | < 2.17E+01 | < 2.17E+01 |
| 03/02/10 | < 7.66E+00 | < 1.78E+01 | < 1.71E+01 | < 1.75E+01 | < 1.76E+01 | < 9.52E+00 | < 2.24E+01 |
| 03/09/10 | < 7.28E+00 | < 1.71E+01 | < 1.71E+01 | < 1.71E+01 | < 1.71E+01 | < 1.41E+01 | < 1.41E+01 |
| 03/16/10 | < 1.76E+01 | < 3.01E+01 | < 2.99E+01 | < 3.63E+01 | < 3.00E+01 | < 3.00E+01 | < 3.32E+01 |
| 03/23/10 | < 2.05E+01 | < 2.04E+01 | < 2.12E+01 | < 2.09E+01 | < 2.06E+01 | < 2.52E+01 | < 2.51E+01 |
| 03/31/10 | < 2.12E+01 | < 2.13E+01 | < 2.06E+01 | < 2.08E+01 | < 0.00E+00 | < 1.89E+01 | < 1.90E+01 |
| 04/06/10 | < 2.68E+01 | < 2.71E+01 | < 2.69E+01 | < 2.77E+01 | < 2.61E+01 | < 1.18E+01 | < 2.13E+01 |
| 04/14/10 | < 2.03E+01 | < 2.03E+01 | < 2.04E+01 | < 2.03E+01 | < 4.53E+01 | < 1.83E+01 | < 1.01E+01 |
| 04/20/10 | < 1.05E+01 | < 2.46E+01 | < 2.45E+01 | < 2.46E+01 | < 3.81E+01 | < 2.61E+01 | < 2.61E+01 |
| 04/27/10 | < 2.50E+01 | < 2.51E+01 | < 2.51E+01 | < 2.51E+01 | < 1.87E+01 | < 1.87E+01 | < 1.87E+01 |
| 05/04/10 | < 1.18E+01 | < 2.76E+01 | < 2.76E+01 | < 2.76E+01 | < 2.76E+01 | < 2.33E+01 | < 2.33E+01 |
| 05/11/10 | < 2.58E+00 | < 4.67E+00 | < 4.67E+00 | < 4.67E+00 | < 4.67E+00 | < 6.23E+00 | < 6.23E+00 |
| 05/19/10 | < 1.32E+01 | < 1.31E+01 | < 1.34E+01 | < 1.32E+01 | < 1.24E+01 | < 1.24E+01 | < 1.24E+01 |
| 05/25/10 | < 1.07E+01 | < 2.04E+01 | < 1.93E+01 | < 1.95E+01 | < 2.00E+01 | < 1.89E+01 | < 1.89E+01 |
| 06/02/10 | < 2.45E+01 | < 4.45E+01 | < 4.47E+01 | < 4.49E+01 | < 4.49E+01 | < 5.26E+01 | < 5.23E+01 |
| 06/08/10 | < 1.57E+01 | < 2.84E+01 | < 2.82E+01 | < 2.82E+01 | < 2.82E+01 | < 3.54E+01 | < 3.54E+01 |
| 06/15/10 | < 1.68E+01 | < 1.68E+01 | < 1.69E+01 | < 1.69E+01 | < 2.42E+01 | < 2.42E+01 | < 2.42E+01 |
| 06/22/10 | < 5.54E+00 | < 1.01E+01 | < 1.01E+01 | < 1.01E+01 | < 1.01E+01 | < 1.18E+01 | < 1.18E+01 |
| 06/29/10 | < 2.81E+01 | < 2.79E+01 | < 2.80E+01 | < 2.79E+01 | < 2.77E+01 | < 2.77E+01 | < 2.77E+01 |

# Table 3-4

Airborne Iodine

I-131

[$10^{-3}$ pCi/$m^3$]



| Period Ending | Station 21 | Station 22 | Station 23 | Station 24* | Station 01A | Station 05A |
|---|---|---|---|---|---|---|
| 01/05/10 | < 3.93E+01 | < 3.93E+01 | < 3.76E+01 | < 3.77E+01 | < 3.73E+01 | < 3.77E+01 |
| 01/12/10 | < 3.00E+01 | < 2.40E+01 | < 2.40E+01 | < 2.39E+01 | < 2.40E+01 | < 1.32E+01 |
| 01/19/10 | < 2.46E+01 | < 2.47E+01 | < 2.46E+01 | < 2.76E+01 | < 2.76E+01 | < 2.76E+01 |
| 01/28/10 | < 3.66E+01 | < 3.65E+01 | < 2.98E+01 | < 2.98E+01 | < 2.97E+01 | < 2.98E+01 |
| 02/05/10 | < 1.07E+01 | < 1.07E+01 | < 1.07E+01 | < 2.18E+01 | < 2.18E+01 | < 2.18E+01 |
| 02/09/10 | < 1.09E+01 | < 1.26E+01 | < 1.22E+01 | < 1.14E+01 | < 2.69E+01 | < 1.13E+01 |
| 02/16/10 | < 9.51E+00 | < 9.68E+00 | < 9.83E+00 | < 1.02E+01 | < 1.00E+01 | < 1.01E+01 |
| 02/23/10 | < 2.17E+01 | < 2.12E+01 | < 1.08E+01 | < 1.08E+01 | < 1.06E+01 | < 1.08E+01 |
| 03/02/10 | < 2.27E+01 | < 2.27E+01 | < 2.26E+01 | < 1.94E+01 | < 2.01E+01 | < 1.96E+01 |
| 03/09/10 | < 1.41E+01 | < 1.41E+01 | < 1.58E+01 | < 1.58E+01 | < 1.58E+01 | < 1.58E+01 |
| 03/16/10 | < 3.33E+01 | < 3.32E+01 | < 3.33E+01 | < 3.63E+01 | < 3.66E+01 | < 3.63E+01 |
| 03/23/10 | < 2.54E+01 | < 2.53E+01 | < 1.07E+01 | < 1.10E+01 | < 1.09E+01 | < 1.09E+01 |
| 03/31/10 | < 1.91E+01 | < 1.89E+01 | < 1.48E+01 | < 1.43E+01 | < 1.48E+01 | < 1.44E+01 |
| 04/06/10 | < 2.13E+01 | < 2.12E+01 | < 2.25E+01 | < 2.33E+01 | < 2.31E+01 | < 2.37E+01 |
| 04/14/10 | < 1.83E+01 | < 1.83E+01 | < 1.11E+01 | < 2.54E+01 | < 2.53E+01 | < 2.53E+01 |
| 04/20/10 | < 2.62E+01 | < 2.62E+01 | < 2.50E+01 | < 2.51E+01 | < 2.52E+01 | < 2.51E+01 |
| 04/27/10 | < 1.14E+01 | < 1.86E+01 | < 2.16E+01 | < 2.15E+01 | < 2.15E+01 | < 2.15E+01 |
| 05/04/10 | < 2.33E+01 | < 2.33E+01 | < 3.42E+01 | < 3.42E+01 | < 3.42E+01 | < 3.42E+01 |
| 05/11/10 | < 6.25E+00 | < 1.05E+01 | < 1.21E+01 | < 1.21E+01 | < 1.21E+01 | < 1.21E+01 |
| 05/19/10 | < 1.24E+01 | < 7.10E+00 | < 1.50E+01 | < 1.55E+01 | < 1.53E+01 | < 1.51E+01 |
| 05/25/10 | < 1.90E+01 | < 1.90E+01 | < 2.39E+01 | < 2.29E+01 | < 2.32E+01 | < 2.38E+01 |
| 06/02/10 | < 5.22E+01 | < 5.63E+01 | < 5.57E+01 | < 5.59E+01 | < 6.01E+01 | < 5.61E+01 |
| 06/08/10 | < 3.61E+01 | < 3.59E+01 | < 4.85E+01 | < 4.77E+01 | < 4.83E+01 | < 4.77E+01 |
| 06/15/10 | < 2.41E+01 | < 2.36E+01 | < 2.35E+01 | < 7.19E+00 | < 2.36E+01 | < 2.37E+01 |
| 06/22/10 | < 1.18E+01 | < 1.18E+01 | < 1.11E+01 | < 1.11E+01 | < 1.11E+01 | < 1.11E+01 |
| 06/29/10 | < 2.77E+01 | < 2.49E+01 | < 2.49E+01 | < 2.49E+01 | < 2.50E+01 | < 1.06E+01 |
| 01/05/10 | < 3.93E+01 | < 3.93E+01 | < 3.76E+01 | < 3.77E+01 | < 3.73E+01 | < 3.77E+01 |

* Control Station

# Table 3-4
## Airborne Iodine
## I-131
## [$10^{-3}$ pCi/$m^3$]



| Period Ending | Station 01 | Station 02 | Station 03 | Station 04 | Station 05 | Station 06 | Station 07 |
|---|---|---|---|---|---|---|---|
| 07/08/09 | < 1.36E+01 | < 2.49E+01 | < 2.49E+01 | < 2.50E+01 | < 2.50E+01 | < 2.71E+01 | < 2.71E+01 |
| 07/13/10 | < 2.26E+01 | < 2.26E+01 | < 2.26E+01 | < 2.25E+01 | < 2.44E+01 | < 2.44E+01 | < 2.45E+01 |
| 07/21/10 | < 9.12E+00 | < 2.13E+01 | < 2.14E+01 | < 2.14E+01 | < 2.14E+01 | < 2.14E+01 | < 2.14E+01 |
| 07/27/10 | < 8.91E+00 | < 1.07E+01 | < 1.94E+01 | < 1.95E+01 | < 1.95E+01 | < 1.95E+01 | < 2.49E+01 |
| 08/04/10 | < 2.14E+01 | < 1.18E+01 | < 2.15E+01 | < 2.14E+01 | < 2.14E+01 | < 1.29E+01 | < 3.03E+01 |
| 08/12/10 | < 2.05E+01 | < 2.04E+01 | < 2.04E+01 | < 2.04E+01 | < 1.25E+01 | < 1.90E+01 | < 1.90E+01 |
| 08/18/10 | < 9.60E+00 | < 9.58E+00 | < 9.55E+00 | < 9.59E+00 | < 9.59E+00 | < 3.36E+01 | < 3.35E+01 |
| 08/24/10 | < 1.99E+01 | < 2.06E+01 | < 8.36E+00 | < 1.96E+01 | < 1.96E+01 | < 1.43E+01 | < 1.42E+01 |
| 08/31/10 | < 3.10E+01 | < 3.15E+01 | < 3.14E+01 | < 3.16E+01 | < 2.54E+01 | < 2.52E+01 | < 2.52E+01 |
| 09/07/10 | < 3.87E+01 | < 3.83E+01 | < 3.83E+01 | < 2.10E+01 | < 3.83E+01 | < 1.85E+01 | < 4.35E+01 |
| 09/14/10 | < 2.99E+01 | < 3.02E+01 | < 3.04E+01 | < 3.04E+01 | < 2.35E+01 | < 2.35E+01 | < 2.35E+01 |
| 09/21/10 | < 1.16E+01 | < 2.68E+01 | < 2.79E+01 | < 2.75E+01 | < 2.72E+01 | < 2.61E+01 | < 2.60E+01 |
| 09/28/10 | < 3.70E+01 | < 3.73E+01 | < 3.57E+01 | < 3.62E+01 | < 1.59E+01 | < 1.59E+01 | < 2.92E+01 |
| 10/06/10 | < 1.82E+01 | < 3.28E+01 | < 3.40E+01 | < 3.36E+01 | < 3.32E+01 | < 1.87E+01 | < 4.34E+01 |
| 10/12/10 | < 4.65E+01 | < 4.61E+01 | < 4.63E+01 | < 4.63E+01 | < 6.03E+01 | < 6.00E+01 | < 6.02E+01 |
| 10/19/10 | < 4.24E+01 | < 4.25E+01 | < 4.24E+01 | < 4.24E+01 | < 6.08E+01 | < 2.60E+01 | < 6.10E+01 |
| 10/26/10 | < 2.66E+01 | < 4.90E+01 | < 4.72E+01 | < 4.78E+01 | < 4.85E+01 | < 4.27E+01 | < 4.30E+01 |
| 11/02/10 | < 5.95E+01 | < 5.94E+01 | < 5.95E+01 | < 5.94E+01 | < 5.92E+01 | < 5.92E+01 | < 3.26E+01 |
| 11/09/10 | < 4.16E+01 | < 4.16E+01 | < 4.13E+01 | < 4.15E+01 | < 3.22E+01 | < 3.22E+01 | < 3.22E+01 |
| 11/16/10 | < 2.61E+01 | < 6.41E+01 | < 4.88E+01 | < 4.81E+01 | < 4.47E+01 | < 3.64E+01 | < 3.64E+01 |
| 11/23/10 | < 6.82E+01 | < 6.75E+01 | < 6.86E+01 | < 6.84E+01 | < 6.23E+01 | < 6.21E+01 | < 6.20E+01 |
| 11/30/10 | < 3.50E+01 | < 3.54E+01 | < 3.41E+01 | < 3.46E+01 | < 1.92E+01 | < 3.87E+01 | < 3.88E+01 |
| 12/07/10 | < 1.17E+01 | < 2.14E+01 | < 2.14E+01 | < 2.14E+01 | < 2.14E+01 | < 1.78E+01 | < 1.78E+01 |
| 12/14/10 | < 2.32E+01 | < 2.32E+01 | < 2.31E+01 | < 2.32E+01 | < 2.43E+01 | < 2.43E+01 | < 2.43E+01 |
| 12/21/10 | < 2.64E+01 | < 4.68E+01 | < 4.79E+01 | < 4.85E+01 | < 4.77E+01 | < 5.40E+01 | < 5.34E+01 |
| 12/28/10 | < 3.52E+01 | < 3.57E+01 | < 3.49E+01 | < 3.46E+01 | < 5.35E+01 | < 5.39E+01 | < 5.45E+01 |

# Table 3-4
## Airborne Iodine
## I-131
## [$10^{-3}$ pCi/$m^3$]



| Period Ending | Station 21 | Station 22 | Station 23 | Station 24* | Station 01A | Station 05A |
|---|---|---|---|---|---|---|
| 07/08/09 | < 2.70E+01 | < 2.70E+01 | < 2.19E+01 | < 2.20E+01 | < 2.19E+01 | < 2.20E+01 |
| 07/13/10 | < 2.46E+01 | < 2.43E+01 | < 2.43E+01 | < 2.42E+01 | < 2.43E+01 | < 1.48E+01 |
| 07/21/10 | < 2.13E+01 | < 2.13E+01 | < 2.66E+01 | < 2.67E+01 | < 2.67E+01 | < 2.67E+01 |
| 07/27/10 | < 2.48E+01 | < 2.48E+01 | < 2.48E+01 | < 1.79E+01 | < 1.77E+01 | < 1.79E+01 |
| 08/04/10 | < 3.03E+01 | < 3.03E+01 | < 3.03E+01 | < 2.64E+01 | < 2.64E+01 | < 2.64E+01 |
| 08/12/10 | < 1.91E+01 | < 1.91E+01 | < 2.52E+01 | < 2.51E+01 | < 2.52E+01 | < 2.51E+01 |
| 08/18/10 | < 3.37E+01 | < 3.34E+01 | < 2.92E+01 | < 2.91E+01 | < 2.91E+01 | < 2.91E+01 |
| 08/24/10 | < 1.44E+01 | < 1.45E+01 | < 2.24E+01 | < 2.19E+01 | < 2.25E+01 | < 2.21E+01 |
| 08/31/10 | < 2.48E+01 | < 1.06E+01 | < 1.33E+01 | < 1.35E+01 | < 1.32E+01 | < 1.35E+01 |
| 09/07/10 | < 4.37E+01 | < 4.37E+01 | < 4.34E+01 | < 4.30E+01 | < 4.36E+01 | < 4.32E+01 |
| 09/14/10 | < 2.34E+01 | < 1.29E+01 | < 2.66E+01 | < 5.67E+01 | < 2.65E+01 | < 2.68E+01 |
| 09/21/10 | < 2.62E+01 | < 2.62E+01 | < 2.71E+01 | < 2.79E+01 | < 2.70E+01 | < 2.76E+01 |
| 09/28/10 | < 2.90E+01 | < 2.89E+01 | < 3.02E+01 | < 2.92E+01 | < 3.04E+01 | < 2.94E+01 |
| 10/06/10 | < 4.37E+01 | < 4.37E+01 | < 4.30E+01 | < 1.62E+01 | < 1.57E+01 | < 1.61E+01 |
| 10/12/10 | < 6.06E+01 | < 5.35E+01 | < 5.30E+01 | < 5.32E+01 | < 5.29E+01 | < 2.93E+01 |
| 10/19/10 | < 6.07E+01 | < 6.07E+01 | < 4.35E+01 | < 4.33E+01 | < 4.47E+01 | < 4.33E+01 |
| 10/26/10 | < 4.24E+01 | < 4.24E+01 | < 4.88E+01 | < 4.76E+01 | < 4.79E+01 | < 4.81E+01 |
| 11/02/10 | < 5.93E+01 | < 5.93E+01 | < 6.90E+01 | < 6.90E+01 | < 6.90E+01 | < 6.88E+01 |
| 11/09/10 | < 3.22E+01 | < 3.73E+01 | < 3.73E+01 | < 3.70E+01 | < 3.74E+01 | < 1.59E+01 |
| 11/16/10 | < 2.00E+01 | < 3.64E+01 | < 3.90E+01 | < 3.90E+01 | < 3.89E+01 | < 3.90E+01 |
| 11/23/10 | < 6.25E+01 | < 3.01E+01 | < 4.82E+01 | < 5.00E+01 | < 4.80E+01 | < 4.92E+01 |
| 11/30/10 | < 3.84E+01 | < 3.84E+01 | < 3.95E+01 | < 3.84E+01 | < 3.97E+01 | < 3.88E+01 |
| 12/07/10 | < 1.78E+01 | < 1.78E+01 | < 1.80E+01 | < 1.80E+01 | < 1.80E+01 | < 1.80E+01 |
| 12/14/10 | < 2.43E+01 | < 3.19E+01 | < 1.36E+01 | < 3.19E+01 | < 3.19E+01 | < 3.19E+01 |
| 12/21/10 | < 5.44E+01 | < 5.44E+01 | < 4.95E+01 | < 5.13E+01 | < 5.10E+01 | < 5.08E+01 |
| 12/28/10 | < 5.35E+01 | < 4.74E+01 | < 4.87E+01 | < 1.99E+01 | < 4.76E+01 | < 4.74E+00 |

* Control Station

# Table 3-5
## Airborne Particulate
## Gamma Spectra
## [$10^{-3}$ pCi/$m^3$]



Quarter 1

| Sampling Location | Be-7 | | | Cs-134** | | Cs-137** | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 1.96E+02 | +/- | 4.44E+01 | < | 1.70E+00 | < | 1.71E+00 | | | | |
| 01A | 1.35E+02 | +/- | 3.40E+01 | < | 1.59E+00 | < | 1.14E+00 | | | | |
| 02 | 1.61E+02 | +/- | 4.17E+01 | < | 1.83E+00 | < | 1.76E+00 | | | | |
| 03 | 1.74E+02 | +/- | 3.36E+01 | < | 1.28E+00 | < | 1.65E+00 | | | | |
| 04 | 1.36E+02 | +/- | 3.13E+01 | < | 1.32E+00 | < | 1.38E+00 | | | | |
| 05 | 2.07E+02 | +/- | 4.15E+01 | < | 1.86E+00 | < | 1.88E+00 | | | | |
| 05A | 1.56E+02 | +/- | 3.40E+01 | < | 1.31E+00 | < | 1.13E+00 | | | | |
| 06 | 1.03E+02 | +/- | 3.60E+01 | < | 1.46E+00 | < | 1.38E+00 | | | | |
| 07 | 1.54E+02 | +/- | 3.11E+01 | < | 1.35E+00 | < | 1.51E+00 | | | | |
| 21 | 1.21E+02 | +/- | 2.84E+01 | < | 1.27E+00 | < | 1.26E+00 | | | | |
| 22 | 1.82E+02 | +/- | 3.45E+01 | < | 1.64E+00 | < | 1.62E+00 | | | | |
| 23 | 1.60E+02 | +/- | 3.12E+01 | < | 1.42E+00 | < | 1.15E+00 | | | | |
| 24* | 1.96E+02 | +/- | 3.74E+01 | < | 1.66E+00 | < | 1.69E+00 | | | | |

Quarter 2

| Sampling Location | Be-7 | | | Cs-134** | | Cs-137** | | Sr-89 | | Sr-90 | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 2.01E+02 | +/- | 4.43E+01 | < | 1.94E+00 | < | 2.20E+00 | < | 5.75E+00 | < | 1.88E+00 |
| 01A | 1.40E+02 | +/- | 3.85E+01 | < | 2.19E+00 | < | 1.67E+00 | < | 5.87E+00 | < | 1.37E+00 |
| 02 | 1.75E+02 | +/- | 4.22E+01 | < | 1.83E+00 | < | 2.07E+00 | < | 5.62E+00 | < | 1.70E+00 |
| 03 | 1.71E+02 | +/- | 4.21E+01 | < | 2.12E+00 | < | 2.00E+00 | < | 6.68E+00 | < | 2.23E+00 |
| 04 | 1.73E+02 | +/- | 4.63E+01 | < | 1.77E+00 | < | 2.03E+00 | < | 6.57E+00 | < | 2.66E+00 |
| 05 | 1.74E+02 | +/- | 4.03E+01 | < | 1.97E+00 | < | 1.47E+00 | < | 7.03E+00 | < | 2.44E+00 |
| 05A | 2.26E+02 | +/- | 4.40E+01 | < | 1.47E+00 | < | 2.46E+00 | < | 7.23E+00 | < | 2.16E+00 |
| 06 | 1.90E+02 | +/- | 3.55E+01 | < | 1.80E+00 | < | 1.81E+00 | < | 7.19E+00 | < | 3.14E+00 |
| 07 | 1.88E+02 | +/- | 3.29E+01 | < | 2.20E+00 | < | 1.81E+00 | < | 6.67E+00 | < | 2.43E+00 |
| 21 | 1.61E+02 | +/- | 4.31E+01 | < | 2.20E+00 | < | 1.69E+00 | < | 5.99E+00 | < | 1.85E+00 |
| 22 | 1.34E+02 | +/- | 3.71E+01 | < | 1.45E+00 | < | 1.29E+00 | < | 6.80E+00 | < | 2.00E+00 |
| 23 | 1.94E+02 | +/- | 3.50E+01 | < | 1.73E+00 | < | 1.39E+00 | < | 6.57E+00 | < | 1.84E+00 |
| 24* | 1.66E+02 | +/- | 4.23E+01 | < | 1.91E+00 | < | 1.84E+00 | < | 5.54E+00 | < | 1.27E+00 |

*Control Station ** LLD identified in ODCM

# Table 3-5
## Airborne Particulate
## Gamma Spectra
## [$10^{-3}$ pCi/$m^3$]



Quarter 3

| Sampling Location | Be-7 | | | Cs-134** | | Cs-137** | |
|---|---|---|---|---|---|---|---|
| 01 | 1.25E+02 | +/- | 2.99E+01 | < | 1.69E+00 | < | 1.46E+00 |
| 01A | 1.29E+02 | +/- | 2.56E+01 | < | 1.63E+00 | < | 1.48E+00 |
| 02 | 1.58E+02 | +/- | 3.08E+01 | < | 1.86E+00 | < | 1.49E+00 |
| 03 | 1.50E+02 | +/- | 2.38E+01 | < | 1.30E+00 | < | 1.30E+00 |
| 04 | 1.57E+02 | +/- | 3.06E+01 | < | 1.45E+00 | < | 1.46E+00 |
| 05 | 1.45E+02 | +/- | 3.20E+01 | < | 1.61E+00 | < | 1.46E+00 |
| 05A | 1.40E+02 | +/- | 2.56E+01 | < | 1.72E+00 | < | 1.48E+00 |
| 06 | 1.68E+02 | +/- | 3.29E+01 | < | 1.56E+00 | < | 9.49E-01 |
| 07 | 1.13E+02 | +/- | 2.84E+01 | < | 1.46E+00 | < | 1.38E+00 |
| 21 | 1.35E+02 | +/- | 3.23E+01 | < | 1.55E+00 | < | 1.61E+00 |
| 22 | 1.25E+02 | +/- | 2.78E+01 | < | 1.81E+00 | < | 1.58E+00 |
| 23 | 1.39E+02 | +/- | 2.34E+01 | < | 1.47E+00 | < | 1.05E+00 |
| 24* | 1.62E+02 | +/- | 2.98E+01 | < | 1.29E+00 | < | 1.28E+00 |

MEAN

Quarter 4

| Sampling Location | Be-7 | | | Cs-134** | | Cs-137** | | MEANS Be-7 | | |
|---|---|---|---|---|---|---|---|---|---|---|
| 01 | 1.33E+02 | +/- | 2.68E+01 | < | 1.43E+00 | < | 1.20E+00 | 1.64E+02 | +/- | 3.64E+01 |
| 01A | 1.30E+02 | +/- | 2.41E+01 | < | 1.19E+00 | < | 8.22E-01 | 1.34E+02 | +/- | 3.06E+01 |
| 02 | 1.21E+02 | +/- | 2.30E+01 | < | 1.11E+00 | < | 1.26E+00 | 1.54E+02 | +/- | 3.44E+01 |
| 03 | 1.20E+02 | +/- | 2.32E+01 | < | 1.06E+00 | < | 1.20E+00 | 1.54E+02 | +/- | 3.07E+01 |
| 04 | 1.26E+02 | +/- | 2.68E+01 | < | 7.70E-01 | < | 9.61E-01 | 1.48E+02 | +/- | 3.38E+01 |
| 05 | 1.27E+02 | +/- | 2.40E+01 | < | 1.05E+00 | < | 9.66E-01 | 1.63E+02 | +/- | 3.45E+01 |
| 05A | 1.39E+02 | +/- | 2.98E+01 | < | 1.11E+00 | < | 1.74E+00 | 1.65E+02 | +/- | 3.34E+01 |
| 06 | 1.35E+02 | +/- | 2.83E+01 | < | 1.43E+00 | < | 1.33E+00 | 1.49E+02 | +/- | 3.32E+01 |
| 07 | 1.14E+02 | +/- | 2.69E+01 | < | 1.45E+00 | < | 1.03E+00 | 1.42E+02 | +/- | 2.98E+01 |
| 21 | 1.15E+02 | +/- | 2.32E+01 | < | 1.06E+00 | < | 1.04E+00 | 1.33E+02 | +/- | 3.18E+01 |
| 22 | 1.63E+02 | +/- | 2.86E+01 | < | 9.50E-01 | < | 1.02E+00 | 1.51E+02 | +/- | 3.20E+01 |
| 23 | 1.34E+02 | +/- | 2.50E+01 | < | 1.29E+00 | < | 1.26E+00 | 1.57E+02 | +/- | 2.87E+01 |
| 24* | 1.17E+02 | +/- | 2.55E+01 | < | 6.57E-01 | < | 5.10E-01 | 1.60E+02 | +/- | 3.38E+01 |

* Control Station ** LLD identified in ODCM Mean of All Indicator Location: 1.51E+02 +/- 3.24E+01

# Table 3-6

## Soil

[pCi/kg]



| Sample Date | Station | Sr-89 | | | Sr-90 | | | K-40 | | | Cs-134 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Acivity Conc | 2 Sigma | MDC | Acivity Conc | 2 Sigma | MDC | Acivity Conc | 2 Sigma | MDC | Acivity Conc | 2 Sigma | MDC |
| 7/6/10 | 01 | | < | 1.04E+02 | | < | 5.51E+01 | 2.13E+03 | +/- | 1.74E+03 | | < | 6.33E+01 |
| 7/6/10 | 02 | | < | 1.28E+02 | | < | 7.30E+01 | 7.98E+03 | +/- | 1.64E+03 | | < | 4.69E+01 |
| 7/6/10 | 03 | | < | 8.91E+01 | | < | 3.93E+01 | 9.11E+03 | +/- | 8.30E+02 | 7.52E+01 | +/- | 3.75E+01 |
| 7/6/10 | 04 | | < | 1.21E+02 | | < | 5.91E+01 | 3.98E+03 | +/- | 8.42E+02 | | < | 5.88E+01 |
| 7/6/10 | 05 | | < | 9.41E+01 | | < | 4.85E+01 | 8.85E+03 | +/- | 1.15E+03 | | < | 5.45E+01 |
| 7/6/10 | 05A | | < | 9.87E+01 | | < | 3.67E+01 | 6.75E+03 | +/- | 1.06E+03 | 3.09E+02 | +/- | 5.45E+02 |
| 7/6/10 | 06 | | < | 1.18E+02 | | < | 5.69E+01 | 1.50E+04 | +/- | 1.48E+03 | | < | 6.39E+01 |
| 7/6/10 | 07 | | < | 8.88E+01 | | < | 4.97E+01 | 4.41E+03 | +/- | 1.38E+03 | | < | 6.04E+01 |
| 7/6/10 | 21 | | < | 8.77E+01 | | < | 3.72E+01 | 9.89E+03 | +/- | 1.07E+03 | | < | 4.48E+01 |
| 7/6/10 | 22 | | < | 1.15E+02 | | < | 4.63E+01 | 1.72E+04 | +/- | 2.02E+03 | | < | 7.45E+01 |
| 7/6/10 | 23 | | < | 1.06E+02 | | < | 4.31E+01 | 2.27E+04 | +/- | 1.73E+03 | 3.27E+02 | +/- | 6.95E+01 |
| 7/6/10 | 24* | | < | 1.12E+02 | | < | 5.63E+01 | 5.23E+03 | +/- | 9.33E+02 | | < | 7.10E+01 |

| Sample Date | Station | Cs-137 | | | Ra-226 | | | Th-228 | | | Th-232 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Acivity Conc | 2 Sigma | MDC | Acivity Conc | 2 Sigma | MDC | Acivity Conc | 2 Sigma | MDC | Acivity Conc | 2 Sigma | MDC |
| 7/6/10 | 01 | | < | 7.54E+01 | 2.68E+03 | +/- | 1.53E+03 | 9.14E+02 | +/- | 1.37E+02 | 1.09E+03 | +/- | 1.63E+02 |
| 7/6/10 | 02 | 1.79E+02 | +/- | 1.09E+02 | | < | 1.42E+03 | 6.38E+02 | +/- | 1.24E+02 | 6.84E+02 | +/- | 1.49E+02 |
| 7/6/10 | 03 | 1.18E+02 | +/- | 5.27E+01 | 3.02E+03 | +/- | 1.11E+03 | 1.74E+03 | +/- | 1.31E+02 | 1.22E+03 | +/- | 1.64E+02 |
| 7/6/10 | 04 | 4.01E+02 | +/- | 7.80E+01 | 1.95E+03 | +/- | 1.12E+03 | 7.47E+02 | +/- | 9.34E+01 | 5.38E+02 | +/- | 1.58E+02 |
| 7/6/10 | 05 | 1.91E+02 | +/- | 7.28E+01 | 1.81E+03 | +/- | 1.12E+03 | 1.14E+03 | +/- | 1.14E+02 | 1.13E+03 | +/- | 1.57E+02 |
| 7/6/10 | 05A | 1.52E+02 | +/- | 4.69E+01 | | < | 1.77E+03 | 9.84E+02 | +/- | 1.36E+02 | | < | |
| 7/6/10 | 06 | 4.18E+02 | +/- | 9.62E+01 | 2.91E+03 | +/- | 1.70E+03 | 9.44E+02 | +/- | 1.79E+02 | 1.37E+03 | +/- | 2.24E+02 |
| 7/6/10 | 07 | 9.72E+01 | +/- | 8.36E+01 | 1.96E+03 | +/- | 1.97E+03 | 1.02E+03 | +/- | 1.68E+02 | 1.21E+03 | +/- | 1.79E+02 |
| 7/6/10 | 21 | 5.27E+01 | +/- | 8.09E+01 | 1.26E+03 | +/- | 9.25E+02 | 4.51E+02 | +/- | 7.71E+01 | 4.41E+02 | +/- | 1.48E+02 |
| 7/6/10 | 22 | 1.46E+02 | +/- | 6.04E+01 | 4.63E+03 | +/- | 2.11E+03 | 2.01E+03 | +/- | 1.70E+02 | 1.90E+03 | +/- | 2.43E+02 |
| 7/6/10 | 23 | 1.49E+02 | +/- | 6.37E+01 | | < | 2.28E+03 | 1.16E+03 | +/- | 1.30E+02 | 9.30E+02 | +/- | 2.06E+02 |
| 7/6/10 | 24* | 8.42E+01 | +/- | 5.48E+01 | 2.79E+03 | +/- | 1.58E+03 | 1.53E+03 | +/- | 1.23E+02 | 1.21E+03 | +/- | 2.45E+02 |

*Control Station

# Table 3-6

## Soil

[pCi/kg]



| Sample Date | Station | Sr-89 | | | Sr-90 | | | K-40 | | | Cs-134 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Acivity Conc | 2 Sigma | MDC | Acivity Conc | 2 Sigma | MDC | Acivity Conc | 2 Sigma | MDC | Acivity Conc | 2 Sigma | MDC |
| 11/9/10 | 01 | | < | 7.73E+02 | | < | 4.44E+01 | 1.72E+04 | +/- | 1.52E+03 | | < | 5.75E+01 |
| 11/9/10 | 02 | | < | 6.85E+02 | | < | 4.15E+01 | 9.51E+03 | +/- | 1.44E+03 | | < | 6.55E+01 |
| 11/9/10 | 03 | | < | 6.15E+02 | | < | 4.12E+01 | 3.99E+03 | +/- | 8.09E+02 | | < | 5.52E+01 |
| 11/9/10 | 04 | | < | 6.47E+02 | | < | 4.31E+01 | 9.00E+03 | +/- | 1.37E+03 | | < | 6.62E+01 |
| 11/9/10 | 05 | | < | 7.72E+02 | | < | 4.47E+01 | 1.46E+04 | +/- | 1.55E+03 | | < | 6.42E+01 |
| 11/9/10 | 05A | | < | 7.04E+02 | | < | 4.57E+01 | 8.36E+03 | +/- | 1.15E+03 | | < | 6.33E+01 |
| 11/9/10 | 06 | | < | 6.44E+02 | | < | 5.25E+01 | 1.05E+04 | +/- | 1.57E+03 | | < | 7.21E+01 |
| 11/9/10 | 07 | | < | 5.71E+02 | | < | 3.64E+01 | 5.77E+03 | +/- | 1.24E+03 | | < | 7.27E+01 |
| 11/9/10 | 21 | | < | 5.94E+02 | | < | 3.84E+01 | 1.17E+04 | +/- | 1.20E+03 | | < | 6.21E+01 |
| 11/9/10 | 22 | | < | 6.59E+02 | | < | 3.79E+01 | 1.56E+04 | +/- | 1.66E+03 | | < | 8.07E+01 |
| 11/9/10 | 23 | | < | 7.10E+02 | | < | 3.09E+01 | 2.40E+04 | +/- | 1.54E+03 | | < | 5.58E+01 |
| 11/9/10 | 24* | | < | 7.53E+02 | | < | 3.55E+01 | 2.78E+03 | +/- | 8.94E+02 | | < | 5.14E+01 |
| MEANS | Indicators | | | | | | | 1.08E+04 | +/- | 1.36E+03 | 2.37E+02 | +/- | 2.37E+02 |
| | Control | | | | | | | 4.01E+03 | +/- | 9.14E+02 | | | |

| Sample Date | Station | Cs-137 | | | Ra-226 | | | Th-228 | | | Th-232 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | Acivity Conc | 2 Sigma | MDC | Acivity Conc | 2 Sigma | MDC | Acivity Conc | 2 Sigma | MDC | Acivity Conc | 2 Sigma | MDC |
| 11/9/10 | 01 | | < | 6.65E+01 | 1.73E+03 | +/- | 1.07E+03 | 1.06E+03 | +/- | 9.68E+01 | 8.57E+02 | +/- | 1.73E+02 |
| 11/9/10 | 02 | 6.20E+02 | +/- | 1.05E+02 | 2.37E+03 | +/- | 1.65E+03 | 4.86E+02 | +/- | 9.87E+01 | 3.90E+02 | +/- | 1.72E+02 |
| 11/9/10 | 03 | 3.76E+02 | +/- | 7.03E+01 | 2.00E+03 | +/- | 1.26E+03 | 6.04E+02 | +/- | 9.76E+01 | 3.87E+02 | +/- | 1.26E+02 |
| 11/9/10 | 04 | 7.32E+02 | +/- | 1.15E+02 | | < | 1.65E+03 | 1.19E+03 | +/- | 1.28E+02 | 9.94E+02 | +/- | 2.62E+02 |
| 11/9/10 | 05 | 1.71E+02 | +/- | 7.72E+01 | 2.47E+03 | +/- | 1.33E+03 | 1.27E+03 | +/- | 1.18E+02 | 1.29E+03 | +/- | 1.70E+02 |
| 11/9/10 | 05A | | < | 7.94E+01 | | < | 1.66E+03 | 5.90E+02 | +/- | 1.43E+02 | 8.19E+02 | +/- | 1.63E+02 |
| 11/9/10 | 06 | 1.67E+02 | +/- | 1.09E+02 | 2.02E+03 | +/- | 1.46E+03 | 2.33E+03 | +/- | 1.67E+02 | 2.09E+03 | +/- | 2.79E+02 |
| 11/9/10 | 07 | 4.07E+02 | +/- | 9.07E+01 | 2.21E+03 | +/- | 1.75E+03 | 1.36E+03 | +/- | 1.31E+02 | 1.19E+03 | +/- | 2.56E+02 |
| 11/9/10 | 21 | 5.85E+02 | +/- | 8.76E+01 | 1.84E+03 | +/- | 1.36E+03 | 5.90E+02 | +/- | 9.73E+01 | 4.94E+02 | +/- | 1.38E+02 |
| 11/9/10 | 22 | | < | 1.08E+02 | 3.66E+03 | +/- | 1.76E+03 | 1.69E+03 | +/- | 1.43E+02 | 1.75E+03 | +/- | 2.78E+02 |
| 11/9/10 | 23 | 1.31E+02 | +/- | 6.19E+01 | 2.25E+03 | +/- | 1.14E+03 | 1.93E+03 | +/- | 1.13E+02 | 1.93E+03 | +/- | 1.68E+02 |
| 11/9/10 | 24* | 3.62E+02 | +/- | 8.41E+01 | 3.01E+03 | +/- | 1.39E+03 | 1.01E+03 | +/- | 9.93E+01 | 9.68E+02 | +/- | 1.84E+02 |
| MEANS | Indicator | 2.83E+02 | +/- | 8.12E+01 | 2.40E+03 | +/- | 1.51E+03 | 1.13E+03 | +/- | 1.27E+02 | 1.08E+03 | +/- | 1.89E+02 |
| | Control | 2.23E+02 | +/- | 6.95E+01 | 2.90E+03 | +/- | 1.49E+03 | 1.27E+03 | +/- | 1.11E+02 | 1.09E+03 | +/- | 2.15E+02 |

*Control Station

# Table 3-6
## Soil
[pCi/kg]
Station Mean



| Station | Sr-89 | | | Sr-90 | | | K-40 | | | Cs-134 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Acivity Conc | 2 Sigma | MDC | Acivity Conc | 2 Sigma | MDC | Acivity Conc | 2 Sigma | MDC | Acivity Conc | 2 Sigma | MDC |
| 01 | | | | | | | 9.67E+03 | +/- | 1.63E+03 | | | |
| 02 | | | | | | | 8.75E+03 | +/- | 1.54E+03 | | | |
| 03 | | | | | | | 6.55E+03 | +/- | 8.20E+02 | 7.52E+01 | +/- | 3.75E+01 |
| 04 | | | | | | | 6.49E+03 | +/- | 1.11E+03 | | | |
| 05 | | | | | | | 1.17E+04 | +/- | 1.35E+03 | | | |
| 05A | | | | | | | 7.56E+03 | +/- | 1.11E+03 | 3.09E+02 | +/- | 5.45E+02 |
| 06 | | | | | | | 1.28E+04 | +/- | 1.53E+03 | | | |
| 07 | | | | | | | 5.09E+03 | +/- | 1.31E+03 | | | |
| 21 | | | | | | | 1.08E+04 | +/- | 1.14E+03 | | | |
| 22 | | | | | | | 1.64E+04 | +/- | 1.84E+03 | | | |
| 23 | | | | | | | 2.34E+04 | +/- | 1.64E+03 | 3.27E+02 | +/- | 6.95E+01 |
| 24* | | | | | | | 4.01E+03 | +/- | 9.14E+02 | | | |

| Station | Cs-137 | | | Ra-226 | | | Th-228 | | | Th-232 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | Acivity Conc | 2 Sigma | MDC | Acivity Conc | 2 Sigma | MDC | Acivity Conc | 2 Sigma | MDC | Acivity Conc | 2 Sigma | MDC |
| 01 | | | | 2.21E+03 | +/- | 1.30E+03 | 9.87E+02 | +/- | 1.17E+02 | 9.74E+02 | +/- | 1.68E+02 |
| 02 | 4.00E+02 | +/- | 1.07E+02 | 2.37E+03 | +/- | 1.65E+03 | 5.62E+02 | +/- | 1.11E+02 | 5.37E+02 | +/- | 1.61E+02 |
| 03 | 2.47E+02 | +/- | 6.15E+01 | 2.51E+03 | +/- | 1.19E+03 | 1.17E+03 | +/- | 1.14E+02 | 8.04E+02 | +/- | 1.45E+02 |
| 04 | 5.67E+02 | +/- | 9.65E+01 | 1.95E+03 | +/- | 1.12E+03 | 9.69E+02 | +/- | 1.11E+02 | 7.66E+02 | +/- | 2.10E+02 |
| 05 | 1.81E+02 | +/- | 7.50E+01 | 2.14E+03 | +/- | 1.23E+03 | 1.21E+03 | +/- | 1.16E+02 | 1.21E+03 | +/- | 1.64E+02 |
| 05A | 1.52E+02 | +/- | 4.69E+01 | | | | 7.87E+02 | +/- | 1.40E+02 | 8.19E+02 | +/- | 1.63E+02 |
| 06 | 2.93E+02 | +/- | 1.03E+02 | 2.47E+03 | +/- | 1.58E+03 | 1.64E+03 | +/- | 1.73E+02 | 1.73E+03 | +/- | 2.52E+02 |
| 07 | 2.52E+02 | +/- | 8.72E+01 | 2.09E+03 | +/- | 1.86E+03 | 1.19E+03 | +/- | 1.50E+02 | 1.20E+03 | +/- | 2.18E+02 |
| 21 | 3.19E+02 | +/- | 8.43E+01 | 1.55E+03 | +/- | 1.14E+03 | 5.21E+02 | +/- | 8.72E+01 | 4.68E+02 | +/- | 1.43E+02 |
| 22 | 1.46E+02 | +/- | 6.04E+01 | 4.15E+03 | +/- | 1.94E+03 | 1.85E+03 | +/- | 1.57E+02 | 1.83E+03 | +/- | 2.61E+02 |
| 23 | 1.40E+02 | +/- | 6.28E+01 | 2.25E+03 | +/- | 1.14E+03 | 1.55E+03 | +/- | 1.22E+02 | 1.43E+03 | +/- | 1.87E+02 |
| 24* | 2.23E+02 | +/- | 6.95E+01 | 2.90E+03 | +/- | 1.49E+03 | 1.27E+03 | +/- | 1.11E+02 | 1.09E+03 | +/- | 2.15E+02 |

*Control Station

**Table 3-7**
Precipitation
Gross Beta
[pCi/L]



| Sampling Date | Gross Beta | | | | Rainfall (inches) |
|---|---|---|---|---|---|
| 01/26/10 | 2.35E+01 | +/- | 2.21E+00 | | 2.31 |
| 02/23/10 | 2.20E+00 | +/- | 1.27E+00 | | 2.37 |
| 03/31/10 | 2.46E+00 | +/- | 1.26E+00 | | 4.62 |
| 04/27/10 | 2.90E+00 | +/- | 1.29E+00 | | 1.66 |
| 05/25/10 | 2.77E+00 | +/- | 1.17E+00 | | 2.09 |
| 06/29/10 | | < | 1.70E+00 | | 3.02 |
| 07/27/10 | 2.00E+00 | +/- | 1.26E+00 | | 1.50 |
| 08/31/10 | 6.51E+00 | +/- | 1.35E+00 | | 4.47 |
| 09/28/10 | 3.66E+00 | +/- | 1.30E+00 | | 0.92 |
| 10/26/10 | | < | 1.67E+00 | | 5.51 |
| 11/30/10 | 1.96E+00 | +/- | 1.11E+00 | | 3.25 |
| 12/28/10 | 3.80E+00 | +/- | 1.81E+00 | | 1.92 |
| Mean | 5.18E+00 | +/- | 1.45E+00 | Total | 33.64 |

* LLD identified in ODCM

# Table 3-7
## Precipitation
## Gamma Spectra
## [pCi/L]



| Sampling Location | Be-7 | | | Mn-54 | | | Fe-59 | | | Co-58 | | | Co-60 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01A | | | | | | | | | | | | | | | |
| 06/29/10 | 3.78E+01 | +/- | 2.64E+01 | < | 4.74E-01 | | < | 4.18E+00 | | < | 1.08E+00 | | < | 4.14E-01 | |
| 12/28/10 | | < | 4.87E+01 | < | 1.50E+00 | | < | 1.45E+01 | | < | 3.55E+00 | | < | 1.21E+00 | |

| | Zn-65 | | | Zr-95 | | | Nb-95 | | | Cs-134 | | | Cs-137 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01A | | | | | | | | | | | | | | | |
| 06/29/10 | | < | 1.01E+00 | < | 2.19E+00 | | < | 1.36E+00 | | < | 3.64E-01 | | < | 4.37E-01 | |
| 12/28/10 | | < | 2.95E+00 | < | 6.74E+00 | | < | 3.96E+00 | | < | 1.22E+00 | | < | 1.23E+00 | |

| | Ba-140 | | | La-140 | | | I-131 | | | Th-228 | | | Th-232 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01A | | | | | | | | | | | | | | | |
| 06/29/10 | | < | 1.11E+03 | < | 2.78E+02 | | < | 1.72E+04 | | < | 1.08E+00 | 4.49E+00 | +/- | 2.86E+00 | |
| 12/28/10 | | < | 2.52E+03 | < | 8.30E+02 | | < | 3.22E+04 | | < | 2.41E+00 | | < | 0.00E+00 | |

**MEAN**

| Sampling Location | Be-7 | | | Mn-54 | | | Fe-59 | | | Co-58 | | | Co-60 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01A | | | | | | | | | | | | | | | |
| | 3.78E+01 | +/- | 3.76E+01 | | | | | | | | | | | | |

| | Zn-65 | | | Zr-95 | | | Nb-95 | | | Cs-134 | | | Cs-137 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01A | | | | | | | | | | | | | | | |

| | Ba-140 | | | La-140 | | | I-131 | | | Th-228 | | | Th-232 | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01A | | | | | | | | | | | | | | | |
| | | | | | | | | | | | | 4.49E+00 | +/- | 2.86E+00 | |

# Table 3-8
# Milk
# Gamma Spectra & Strontium
# [pCi/L]



Station 12

| Sampling Date | K-40 | | | Sr-89 | Sr-90 | I-131* | Cs-134* | Cs-137* | Ba-140* | La-140* |
|---|---|---|---|---|---|---|---|---|---|---|
| 01/19/10 | 1.49E+03 | +/- | 1.49E+02 | [a] | [a] | < 6.74E-01 | < 7.41E+00 | < 8.00E+00 | < 4.42E+01 | < 9.18E+00 |
| 02/16/10 | 1.45E+03 | +/- | 1.25E+02 | [a] | [a] | < 6.13E-01 | < 1.97E+00 | < 2.24E+00 | < 1.20E+01 | < 4.15E+00 |
| 03/16/10 | 1.52E+03 | +/- | 1.50E+02 | < 4.37E+00 | < 1.17E+00 | < 5.90E-01 | < 5.65E+00 | < 6.51E+00 | < 3.96E+01 | < 1.23E+01 |
| 04/20/10 | 1.27E+03 | +/- | 1.16E+02 | [a] | [a] | < 7.80E-01 | < 4.81E+00 | < 5.26E+00 | < 2.36E+01 | < 5.92E+00 |

Dairy ceased operations in May 2010.

| Sta. Mean | 1.43E+03 | +/- | 1.35E+02 |
|---|---|---|---|

Station 12A

| Sampling Date | K-40 | | | Sr-89 | Sr-90 | I-131* | Cs-134* | Cs-137* | Ba-140* | La-140* |
|---|---|---|---|---|---|---|---|---|---|---|
| 05/19/10 | 1.30E+03 | +/- | 1.03E+02 | [a] | [a] | < 9.00E-01 | < 4.01E+00 | < 4.18E+00 | < 4.76E+01 | < 1.31E+01 |
| 06/15/10 | 1.16E+03 | +/- | 1.62E+02 | < 3.28E+00 | < 1.59E+00 | < 7.27E-01 | < 8.42E+00 | < 8.83E+00 | < 4.47E+01 | < 1.26E+01 |
| 07/21/10 | 1.26E+03 | +/- | 6.00E+01 | [a] | [a] | < 6.05E-01 | < 2.55E+00 | < 2.86E+00 | < 1.31E+01 | < 3.45E+00 |
| 08/18/10 | 1.47E+03 | +/- | 1.31E+02 | [a] | [a] | < 8.35E-01 | < 4.85E+00 | < 4.41E+00 | < 3.58E+01 | < 8.66E+00 |
| 09/21/10 | 1.22E+03 | +/- | 1.34E+02 | < 2.33E+00 | < 1.06E+00 | < 5.51E-01 | < 6.26E+00 | < 7.43E+00 | < 4.29E+01 | < 7.83E+00 |
| 10/19/10 | 1.25E+03 | +/- | 1.43E+02 | < 3.76E+00 | < 8.44E-01 | < 8.33E-01 | < 5.24E+00 | < 6.55E+00 | < 2.59E+01 | < 8.61E+00 |
| 11/19/10 | 1.44E+03 | +/- | 1.59E+02 | [a] | [a] | < 7.03E-01 | < 5.58E+00 | < 5.98E+00 | < 2.74E+01 | < 1.03E+01 |
| 12/17/09 | 1.30E+03 | +/- | 1.19E+02 | < 4.96E+00 | < 1.23E+00 | < 4.33E-01 | < 4.66E+00 | < 4.99E+00 | < 3.59E+01 | < 1.03E+01 |

| Sta. Mean | 1.30E+03 | +/- | 1.26E+02 |
|---|---|---|---|
| Total Mean | 1.34E+03 | +/- | 1.29E+02 |

* LLD identified in ODCM

[a] Sr-89/90 analyses performed on the last monthly sample of each quarter.

# Table 3-9
## Food and Vegetation
## Gamma Spectra
[pCi/kg]



| Sampling Location | Sampling Date | Be-7 | | | K-40 | | | I-131* | | Cs-134* | | Cs-137* | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 14A | 05/11/10 | | < | 2.11E+02 | 7.31E+03 | +/- | 5.70E+02 | < | 3.34E+01 | < | 1.83E+01 | < | 2.06E+01 |
| | 06/08/10 | 3.90E+02 | +/- | 1.56E+02 | 4.76E+03 | +/- | 3.75E+02 | < | 3.01E+01 | < | 1.47E+01 | < | 1.45E+01 |
| | 07/13/10 | 1.11E+03 | +/- | 2.61E+02 | 4.69E+03 | +/- | 5.17E+02 | < | 3.59E+01 | < | 2.65E+01 | < | 3.02E+01 |
| | 08/10/10 | | < | 7.99E+02 | 9.56E+03 | +/- | 1.54E+03 | < | 2.57E+01 | < | 5.81E+01 | < | 6.17E+01 |
| | 09/14/10 | 1.13E+03 | +/- | 5.14E+02 | 8.18E+03 | +/- | 9.60E+02 | < | 4.78E+01 | < | 4.06E+01 | < | 4.83E+01 |
| | 10/12/10 | 2.71E+03 | +/- | 1.01E+02 | 4.25E+03 | +/- | 1.60E+02 | < | 4.05E+01 | < | 6.31E+00 | < | 6.83E+00 |
| | Mean | 1.06E+02 | +/- | 4.70E+01 | 6.46E+03 | +/- | 5.89E+02 | +/- | | +/- | | +/- | |

| Sampling Location | Sampling Date | Be-7 | | | K-40 | | | I-131* | | Cs-134* | | Cs-137* | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 15 | 05/11/10 | | < | 2.58E+02 | 6.50E+03 | +/- | 6.38E+02 | < | 3.33E+01 | < | 2.49E+01 | < | 2.93E+01 |
| | 06/08/10 | 7.18E+02 | +/- | 1.28E+02 | 7.66E+03 | +/- | 2.91E+02 | < | 3.13E+01 | < | 1.20E+01 | < | 1.30E+01 |
| | 07/13/10 | 4.76E+02 | +/- | 2.17E+02 | 7.05E+03 | +/- | 6.35E+02 | < | 3.72E+01 | < | 2.63E+01 | < | 3.08E+01 |
| | 08/10/10 | 7.56E+02 | +/- | 5.52E+02 | 8.39E+03 | +/- | 1.00E+03 | < | 2.58E+01 | < | 4.94E+01 | < | 5.61E+01 |
| | 09/14/10 | | < | 4.38E+02 | 5.94E+03 | +/- | 7.63E+02 | < | 5.99E+01 | < | 3.98E+01 | < | 3.95E+01 |
| | 10/12/10 | 1.48E+03 | +/- | 7.08E+01 | 4.67E+03 | +/- | 1.35E+02 | < | 2.97E+01 | < | 5.34E+00 | < | 5.84E+00 |
| | Mean | 8.58E+02 | +/- | 2.42E+02 | 6.70E+03 | +/- | 4.95E+02 | +/- | | +/- | | +/- | |

| Sampling Location | Sampling Date | Be-7 | | | K-40 | | | I-131* | | Cs-134* | | Cs-137* | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 16** | 05/11/10 | 3.17E+02 | +/- | 1.85E+02 | 5.59E+03 | +/- | 5.53E+02 | < | 4.58E+01 | < | 2.06E+01 | < | 2.26E+01 |
| ** Control Station | 06/08/10 | 6.64E+02 | +/- | 1.05E+02 | 1.07E+04 | +/- | 3.56E+02 | < | 3.07E+01 | < | 1.24E+01 | < | 1.35E+01 |
| | 07/13/10 | 7.38E+02 | +/- | 2.80E+02 | 5.28E+03 | +/- | 5.24E+02 | < | 4.92E+01 | < | 2.87E+01 | < | 2.90E+01 |
| | 08/10/10 | 5.44E+02 | +/- | 4.56E+02 | 4.93E+03 | +/- | 7.83E+02 | < | 3.19E+01 | < | 4.35E+01 | < | 4.43E+01 |
| | 09/14/10 | 7.33E+02 | +/- | 2.85E+02 | 3.17E+03 | +/- | 4.99E+02 | < | 3.10E+01 | < | 2.33E+01 | < | 2.35E+01 |
| | 10/12/10 | 1.26E+03 | +/- | 5.81E+01 | 5.20E+03 | +/- | 1.37E+02 | < | 3.65E+01 | < | 3.33E+00 | < | 3.99E+00 |
| | Mean | 7.09E+02 | +/- | 1.96E+02 | 5.81E+03 | +/- | 4.07E+02 | +/- | | +/- | | +/- | |

* LLD identified in ODCM

# Table 3-9
## Food and Vegetation
## Gamma Spectra
[pCi/kg]



| Sampling Location | Sampling Date | Be-7 | | | K-40 | | | I-131* | | Cs-134* | | Cs-137* | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 23 | 05/11/10 | 7.31E+02 | +/- | 1.85E+02 | 7.25E+03 | +/- | 3.21E+02 | < | 2.93E+01 | < | 2.06E+01 | < | 1.99E+01 |
| | 06/08/10 | 1.65E+03 | +/- | 2.15E+02 | 5.75E+03 | +/- | 3.84E+02 | < | 2.82E+01 | < | 1.54E+01 | < | 1.74E+01 |
| | 07/13/10 | 1.24E+03 | +/- | 2.24E+02 | 3.64E+03 | +/- | 4.49E+02 | < | 5.66E+01 | < | 2.43E+01 | < | 3.24E+01 |
| | 08/10/10 | 2.81E+03 | +/- | 5.11E+02 | 2.92E+03 | +/- | 5.67E+02 | < | 2.61E+01 | < | 5.79E+01 | < | 5.93E+01 |
| | 09/14/10 | | < | 2.21E+02 | 2.52E+03 | +/- | 3.98E+02 | < | 4.20E+01 | < | 1.97E+01 | < | 2.45E+01 |
| | 10/12/10 | 1.69E+03 | +/- | 9.86E+01 | 3.75E+03 | +/- | 1.50E+02 | < | 3.67E+01 | < | 5.78E+00 | < | 6.29E+00 |
| | Mean | 1.62E+03 | +/- | 2.47E+02 | 4.31E+03 | +/- | 3.24E+02 | | | | | | |

| Sampling Location | Sampling Date | Be-7 | | | K-40 | | | I-131* | | Cs-134* | | Cs-137* | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 26 | 05/11/10 | 4.92E+02 | +/- | 2.01E+02 | 6.60E+03 | +/- | 6.29E+02 | < | 3.49E+01 | < | 2.25E+01 | < | 2.27E+01 |
| | 06/08/11 | 1.46E+03 | +/- | 1.44E+02 | 4.74E+03 | +/- | 2.67E+02 | < | 2.98E+01 | < | 1.32E+01 | < | 1.49E+01 |
| | 0713/10 | 7.55E+02 | +/- | 3.43E+02 | 5.68E+03 | +/- | 7.30E+02 | < | 3.92E+01 | < | 3.28E+01 | < | 4.08E+01 |
| | 08/10/10 | 1.41E+03 | +/- | 5.17E+02 | 4.24E+03 | +/- | 1.02E+03 | < | 3.68E+01 | < | 5.89E+01 | < | 7.46E+01 |
| | 09/14/10 | 3.82E+02 | +/- | 2.26E+02 | 2.08E+03 | +/- | 3.57E+02 | < | 4.01E+01 | < | 2.16E+01 | < | 2.39E+01 |
| | 10/12/10 | 1.69E+03 | +/- | 7.72E+01 | 2.58E+03 | +/- | 1.19E+02 | < | 3.56E+01 | < | 5.46E+00 | < | 5.80E+00 |
| | Mean | 1.03E+03 | +/- | 2.515E+02 | 4.32E+03 | +/- | 4.46E+02 | +/- | | +/- | | +/- | |
| Indicator locations | | 1.26E+03 | +/- | 2.55E+02 | 4.91E+03 | +/- | 3.97E+02 | +/- | | +/- | | +/- | |

* LLD identified in ODCM

# Table 3-10

Well Water

Gamma Spectra, Strontium, and Tritium

[pCi/L]



Station 01A

| Sampling Date | H-3 | Sr-89 | Sr-90 | Mn-54 | Fe-59 | Co-58 | Co-60 | Zn-65 |
|---|---|---|---|---|---|---|---|---|
| 03/31/10 | < 6.26E+02 | [a] | [a] | < 3.48E+00 | < 6.24E+00 | < 3.73E+00 | < 3.17E+00 | < 6.82E+00 |
| 06/29/10 | < 7.12E+02 | < 3.23E+00 | < 6.24E-01 | < 1.81E+00 | < 4.56E+00 | < 2.10E+00 | < 1.98E+00 | < 3.99E+00 |
| 09/28/10 | < 1.69E+02 | [a] | [a] | < 2.60E+00 | < 5.58E+00 | < 3.06E+00 | < 2.63E+00 | < 5.60E+00 |
| 12/28/10 | < 4.02E+02 | [a] | [a] | < 2.49E+00 | < 5.84E+00 | < 2.51E+00 | < 2.53E+00 | < 4.41E+00 |
| Mean | | | | | | | | |

| Sampling Date | Zr-95 | Nb-95 | I-131 | Cs-134 | Cs-137 | Ba-140 | La-140 |
|---|---|---|---|---|---|---|---|
| 03/31/10 | < 6.57E+00 | < 3.85E+00 | < 5.69E-01 | < 2.97E+00 | < 3.32E+00 | < 2.22E+01 | < 8.48E+00 |
| 06/29/10 | < 3.51E+00 | < 2.16E+00 | < 6.70E-01 | < 1.86E+00 | < 1.97E+00 | < 1.31E+00 | < 4.58E+00 |
| 09/28/10 | < 5.32E+00 | < 3.17E+00 | < 7.13E-01 | < 2.73E+00 | < 2.79E+00 | < 1.97E+01 | < 6.47E+00 |
| 12/28/10 | < 4.91E+00 | < 2.92E+00 | < 7.19E-01 | < 2.46E+00 | < 2.68E+00 | < 1.72E+01 | < 6.46E+00 |
| Mean | | | | | | | |

[a] Sr-89/90 analyses performed on the second quarter sample.

# Table 3-11

River Water

Gamma Spectra, Strontium, and Tritium

[pCi/L]



Station 11

| Sampling Date | H-3* | Sr-89 | Sr-90 | Mn-54* | Fe-59* | Co-58* | Co-60* | Zn-65* |
|---|---|---|---|---|---|---|---|---|
| 01/12/10 | [a] | [b] | [b] | < 3.33E+00 | < 9.03E+00 | < 4.14E+00 | < 3.76E+00 | < 7.56E+00 |
| 02/15/10 | [a] | [b] | [b] | < 4.49E+00 | < 8.98E+00 | < 3.60E+00 | < 4.39E+00 | < 7.98E+00 |
| 03/16/10 | 4.66E+03 +/- 9.21E+02 | [b] | [b] | < 4.33E+00 | < 8.49E+00 | < 3.58E+00 | < 3.90E+00 | < 7.34E+00 |
| 04/13/10 | [a] | [b] | [b] | < 1.70E+00 | < 4.41E+00 | < 2.03E+00 | < 1.74E+00 | < 3.54E+00 |
| 05/10/10 | [a] | [b] | [b] | < 2.84E+00 | < 6.81E+00 | < 3.16E+00 | < 2.57E+00 | < 6.14E+00 |
| 06/14/10 | 3.77E+03 +/- 7.44E+02 | < 3.59E+00 | < 6.25E-01 | < 3.78E+00 | < 6.83E+00 | < 3.52E+00 | < 3.07E+00 | < 8.57E+00 |
| 07/12/10 | [a] | [b] | [b] | < 4.66E+00 | < 1.18E+01 | < 5.01E+00 | < 5.55E+00 | < 9.80E+00 |
| 08/16/10 | [a] | [b] | [b] | < 4.05E+00 | < 8.85E+00 | < 4.78E+00 | < 4.30E+00 | < 8.67E+00 |
| 09/14/10 | 3.36E+03 +/- 5.82E+02 | [b] | [b] | < 4.20E+00 | < 9.05E+00 | < 3.06E+00 | < 4.80E+00 | < 9.14E+00 |
| 10/10/10 | [a] | [b] | [b] | < 1.82E+00 | < 3.93E+00 | < 1.90E+00 | < 1.80E+00 | < 3.69E+00 |
| 11/16/10 | [a] | [b] | [b] | < 4.71E+00 | < 8.77E+00 | < 4.14E+00 | < 4.58E+00 | < 7.94E+00 |
| 12/13/10 | 2.25E+03 +/- 7.34E+02 | [b] | [b] | < 3.69E+00 | < 9.04E+00 | < 4.55E+00 | < 3.71E+00 | < 8.96E+00 |
| MEAN | 3.51E+03 +/- 7.45E+02 | | | | | | | |

| Sampling Date | Zr-95* | Nb-95* | I-131* | Cs-134* | Cs-137* | Ba-140* | La-140* |
|---|---|---|---|---|---|---|---|
| 01/12/10 | < 6.43E+00 | < 4.21E+00 | < 5.96E-01 | < 3.51E+00 | < 4.25E+00 | < 2.69E+01 | < 9.74E+00 |
| 02/15/10 | < 7.62E+00 | < 5.00E+00 | < 7.47E-01 | < 4.18E+00 | < 4.86E+00 | < 2.26E+01 | < 6.97E+00 |
| 03/16/10 | < 7.11E+00 | < 4.70E+00 | < 5.77E-01 | < 3.77E+00 | < 3.73E+00 | < 2.14E+01 | < 7.20E+00 |
| 04/13/10 | < 3.36E+00 | < 2.07E+00 | < 5.36E-01 | < 1.66E+00 | < 1.75E+00 | < 1.81E+01 | < 5.40E+00 |
| 05/10/10 | < 5.38E+00 | < 3.27E+00 | < 6.57E-01 | < 2.72E+00 | < 3.36E+00 | < 2.07E+01 | < 6.38E+00 |
| 06/14/10 | < 6.22E+00 | < 4.42E+00 | < 8.34E-01 | < 3.56E+00 | < 3.86E+00 | < 2.73E+01 | < 9.27E+00 |
| 07/12/10 | < 6.99E+00 | < 6.43E+00 | < 6.40E-01 | < 5.34E+00 | < 5.72E+00 | < 2.23E+01 | < 7.92E+00 |
| 08/16/10 | < 7.38E+00 | < 4.43E+00 | < 9.34E-01 | < 3.43E+00 | < 4.38E+00 | < 2.28E+01 | < 6.60E+00 |
| 09/14/10 | < 6.56E+00 | < 5.00E+00 | < 1.00E+00 | < 3.07E+00 | < 5.08E+00 | < 2.50E+01 | < 1.42E+01 |
| 10/10/10 | < 3.43E+00 | < 2.16E+00 | < 8.74E-01 | < 1.74E+00 | < 1.98E+00 | < 1.22E+01 | < 3.64E+00 |
| 11/16/10 | < 7.28E+00 | < 4.72E+00 | < 5.81E-01 | < 4.16E+00 | < 4.25E+00 | < 2.06E+01 | < 5.86E+00 |
| 12/13/10 | < 7.83E+00 | < 4.42E+00 | < 5.56E-01 | < 4.99E+00 | < 5.28E+00 | < 2.52E+01 | < 1.01E+01 |
| MEAN | | | | | | | |

* LLD identified in ODCM

[a] Tritium analyses on quarterly composite.

[b] Sr-89/90 performed annually on 2nd quarter composite sample.

# Table 3-12
## Surface Water
## Gamma Spectra, Strontium, Tritium
## [pCi/L]



| Sampling Date | H-3* | | | Sr-89 | | Sr-90 | | Mn-54* | Fe-59* | Co-58* | Co-60* | Station 08 Zn-65* |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| 01/12/10 | | [a] | | | [b] | | [b] | < 2.83E+00 | < 6.60E+00 | < 2.70E+00 | < 2.70E+00 | < 5.85E+00 |
| 02/15/10 | | [a] | | | [b] | | [b] | < 4.48E+00 | < 8.52E+00 | < 4.11E+00 | < 4.29E+00 | < 7.81E+00 |
| 03/16/10 | 3.35E+03 | +/- | 7.91E+02 | | [b] | | [b] | < 3.55E+00 | < 6.45E+00 | < 3.07E+00 | < 3.81E+00 | < 4.95E+00 |
| 04/13/10 | | [a] | | | [b] | | [b] | < 1.77E+00 | < 4.54E+00 | < 1.91E+00 | < 1.78E+00 | < 3.39E+00 |
| 05/10/10 | | | | | [b] | | [b] | < 3.20E+00 | < 7.85E+00 | < 3.05E+00 | < 3.36E+00 | < 7.42E+00 |
| 06/14/10 | 2.34E+03 | +/- | 6.25E+02 | < | 4.33E+00 | < 6.72E-01 | | < 2.85E+00 | < 8.07E+00 | < 3.25E+00 | < 2.82E+00 | < 6.70E+00 |
| 07/12/10 | | [a] | | | [b] | | [b] | < 7.83E+00 | < 1.46E+01 | < 6.19E+00 | < 5.79E+00 | < 1.16E+01 |
| 08/16/10 | | [a] | | | [b] | | [b] | < 4.87E+00 | < 1.23E+01 | < 5.59E+00 | < 5.06E+00 | < 1.18E+01 |
| 09/14/10 | 4.06E+03 | +/- | 6.45E+02 | | [b] | | [b] | < 7.83E+00 | < 1.50E+01 | < 8.20E+00 | < 7.29E+00 | < 1.22E+01 |
| 10/10/10 | | [a] | | | [b] | | [b] | < 1.32E+00 | < 3.21E+00 | < 1.41E+00 | < 1.37E+00 | < 2.60E+00 |
| 11/16/10 | | [a] | | | [b] | | [b] | < 3.24E+00 | < 7.10E+00 | < 2.93E+00 | < 3.47E+00 | < 7.37E+00 |
| 12/13/10 | 2.65E+03 | +/- | 7.81E+02 | | [b] | | [b] | < 4.43E+00 | < 1.00E+01 | < 4.73E+00 | < 4.22E+00 | < 8.52E+00 |
| Mean | 3.10E+03 | +/- | 7.11E+02 | | | | | | | | | |

| Sampling Date | Zr-95* | | | Nb-95* | | | I-131* | Cs-134* | Cs-137* | Ba-140* | La-140* |
|---|---|---|---|---|---|---|---|---|---|---|---|
| 01/12/10 | < | 5.11E+00 | | < | 3.30E+00 | | < 3.96E-01 | < 2.63E+00 | < 2.96E+00 | < 2.05E+01 | < 6.02E+00 |
| 02/15/10 | < | 7.37E+00 | | < | 4.44E+00 | | < 5.68E-01 | < 4.30E+00 | < 4.59E+00 | < 2.24E+01 | < 8.06E+00 |
| 03/16/10 | < | 6.38E+00 | | < | 3.11E+00 | | < 9.31E-01 | < 3.02E+00 | < 3.82E+00 | < 1.96E+01 | < 6.14E+00 |
| 04/13/10 | < | 3.54E+00 | | < | 1.97E+00 | | < 6.85E-01 | < 1.60E+00 | < 1.93E+00 | < 1.64E+01 | < 6.09E+00 |
| 05/10/10 | < | 6.57E+00 | 6.28E+00 | +/- | 2.53E+00 | | < 6.74E-01 | < 2.76E+00 | < 3.19E+00 | < 2.11E+01 | < 8.15E+00 |
| 06/14/10 | < | 5.64E+00 | | < | 3.93E+00 | | < 9.03E-01 | < 3.30E+00 | < 3.17E+00 | < 2.36E+01 | < 7.26E+00 |
| 07/12/10 | < | 1.09E+01 | | < | 6.10E+00 | | < 5.05E-01 | < 6.73E+00 | < 5.59E+00 | < 2.48E+01 | < 9.47E+00 |
| 08/16/10 | < | 8.95E+00 | | < | 5.41E+00 | | < 9.20E-01 | < 4.98E+00 | < 5.43E+00 | < 2.88E+01 | < 1.00E+01 |
| 09/14/10 | < | 1.66E+01 | | < | 8.35E+00 | | < 8.15E-01 | < 5.69E+00 | < 8.76E+00 | < 5.37E+01 | < 1.22E+01 |
| 10/10/10 | < | 2.42E+00 | | < | 1.54E+00 | | < 4.67E-01 | < 1.24E+00 | < 1.42E+00 | < 8.88E+00 | < 2.93E+00 |
| 11/16/10 | < | 6.17E+00 | | < | 3.75E+00 | | < 6.66E-01 | < 3.64E+00 | < 3.67E+00 | < 1.95E+01 | < 5.58E+00 |
| 12/13/10 | < | 8.05E+00 | | < | 4.43E+00 | | < 5.34E-01 | < 3.63E+00 | < 5.03E+00 | < 2.33E+01 | < 5.54E+00 |
| Mean | | | 6.28E+00 | +/- | 2.53E+00 | | | | | | |

* LLD identified in ODCM

[a] Tritium analyses on quarterly composite.

[b] Sr-89/90 performed annually on 2nd quarter composite sample.

# Table 3-12

## Surface Water

## Gamma Spectra, Strontium, Tritium

[pCi/L]



Station 09A

| Sampling Date | H-3* | Sr-89 | Sr-90 | Mn-54* | Fe-59* | Co-58* | Co-60* | Zn-65* |
|---|---|---|---|---|---|---|---|---|
| 01/12/10 | [a] | [b] | [b] | < 3.15E+00 | < 7.56E+00 | < 3.78E+00 | < 4.05E+00 | < 7.00E+00 |
| 02/15/10 | [a] | [b] | [b] | < 3.99E+00 | < 7.66E+00 | < 4.58E+00 | < 3.21E+00 | < 9.22E+00 |
| 03/16/10 | < 8.50E+02 | [b] | [b] | < 4.12E+00 | < 9.62E+00 | < 5.07E+00 | < 4.88E+00 | < 6.61E+00 |
| 04/13/10 | [a] | [b] | [b] | < 1.66E+00 | < 4.16E+00 | < 1.84E+00 | < 1.57E+00 | < 3.24E+00 |
| 05/10/10 | [a] | [b] | [b] | < 3.21E+00 | < 7.63E+00 | < 3.33E+00 | < 3.50E+00 | < 7.05E+00 |
| 06/14/10 | < 8.63E+02 | < 3.35E+00 | < 5.39E-01 | < 3.88E+00 | < 9.76E+00 | < 4.36E+00 | < 3.30E+00 | < 9.09E+00 |
| 07/12/10 | [a] | [b] | [b] | < 5.43E+00 | < 1.06E+01 | < 4.57E+00 | < 3.68E+00 | < 9.12E+00 |
| 08/16/10 | [a] | [b] | [b] | < 4.70E+00 | < 8.83E+00 | < 4.63E+00 | < 4.89E+00 | < 9.47E+00 |
| 09/14/10 | < 5.80E+02 | [b] | [b] | < 3.96E+00 | < 1.11E+01 | < 4.86E+00 | < 4.77E+00 | < 6.70E+00 |
| 10/10/10 | [a] | [b] | [b] | < 1.96E+00 | < 4.27E+00 | < 2.16E+00 | < 1.94E+00 | < 4.28E+00 |
| 11/16/10 | [a] | [b] | [b] | < 4.42E+00 | < 9.02E+00 | < 3.94E+00 | < 4.13E+00 | < 9.76E+00 |
| 12/13/10 | < 9.88E+02 | [b] | [b] | < 3.53E+00 | < 8.76E+00 | < 4.04E+00 | < 4.43E+00 | < 9.44E+00 |
| MEAN | | | | | | | | |

| Sampling Date | Zr-95* | Nb-95* | I-131* | Cs-134* | Cs-137* | Ba-140* | La-140* |
|---|---|---|---|---|---|---|---|
| 01/12/10 | < 6.26E+00 | < 3.81E+00 | < 4.11E-01 | < 3.13E+00 | < 3.46E+00 | < 2.45E+01 | < 9.28E+00 |
| 02/15/10 | < 6.01E+00 | < 4.51E+00 | < 4.38E-01 | < 3.48E+00 | < 3.88E+00 | < 2.23E+01 | < 6.26E+00 |
| 03/16/10 | < 8.65E+00 | < 4.42E+00 | < 5.47E-01 | < 4.00E+00 | < 4.78E+00 | < 2.55E+01 | < 7.94E+00 |
| 04/13/10 | < 3.31E+00 | < 2.00E+00 | < 3.09E-01 | < 1.52E+00 | < 1.68E+00 | < 1.63E+01 | < 5.42E+00 |
| 05/10/10 | < 5.79E+00 | < 3.56E+00 | < 7.87E-01 | < 2.78E+00 | < 3.29E+00 | < 2.38E+01 | < 8.08E+00 |
| 06/14/10 | < 9.17E+00 | < 5.01E+00 | < 7.88E-01 | < 3.80E+00 | < 4.31E+00 | < 2.99E+01 | < 1.24E+01 |
| 07/12/10 | < 9.73E+00 | < 5.11E+00 | < 6.44E-01 | < 5.53E+00 | < 5.49E+00 | < 2.38E+01 | < 1.00E+01 |
| 08/16/10 | < 8.95E+00 | < 5.10E+00 | < 6.46E-01 | < 4.32E+00 | < 4.75E+00 | < 2.54E+01 | < 9.33E+00 |
| 09/14/10 | < 7.60E+00 | < 3.77E+00 | < 9.43E-01 | < 3.24E+00 | < 5.00E+00 | < 2.84E+01 | < 1.20E+01 |
| 10/10/10 | < 3.63E+00 | < 2.26E+00 | < 4.84E-01 | < 1.89E+00 | < 2.08E+00 | < 1.33E+01 | < 4.02E+00 |
| 11/16/10 | < 7.76E+00 | < 4.94E+00 | < 7.00E-01 | < 4.02E+00 | < 4.69E+00 | < 2.34E+01 | < 5.48E+00 |
| 12/13/10 | < 8.16E+00 | < 3.75E+00 | < 5.90E-01 | < 3.77E+00 | < 4.36E+00 | < 1.94E+01 | < 7.73E+00 |
| MEAN | | | | | | | |

* LLD identified in ODCM

[a] Tritium analyses on quarterly composite.

[b] Sr-89/90 performed annually on 2nd quarter composite sample.

# Table 3-13
## Sediment Silt
## Gamma Spectra, and Strontium
[pCi/Kg]



| Sample Date | Sr-89 | Sr-90 | K-40 | Cs-134* | Cs-137* |
|---|---|---|---|---|---|
| 04/19/2010 | | | | | |
| Station 08 | [a] | [a] | 3.05E+03 +/- 5.06E+02 | < 2.90E+01 | 1.00E+02 +/- 2.59E+01 |
| Station 09A** | [a] | [a] | 1.24E+04 +/- 9.34E+02 | < 3.78E+01 | 1.55E+02 +/- 4.55E+01 |
| Station 11 | [a] | [a] | 1.53E+04 +/- 8.74E+02 | < 3.39E+01 | < 3.52E+01 |

| 04/19/2010 | Ra-226 | Th-228 | Th-232 |
|---|---|---|---|
| Station 08 | 1.02E+03 +/- 5.89E+02 | 3.56E+02 +/- 4.26E+01 | 3.18E+02 +/- 6.42E+01 |
| Station 09A** | 2.76E+03 +/- 9.48E+02 | 9.32E+02 +/- 6.22E+01 | 8.40E+02 +/- 1.27E+02 |
| Station 11 | 2.52E+03 +/- 7.46E+02 | 1.19E+03 +/- 6.50E+01 | 1.15E+03 +/- 1.09E+02 |

| Sample Date | Sr-89 | Sr-90 | K-40 | Cs-134* | Cs-137* |
|---|---|---|---|---|---|
| 10/18/2010 | | | | | |
| Station 08 | < 9.28E+01 | < 3.68E+01 | 1.53E+04 +/- 1.39E+03 | < 5.32E+01 | < 6.41E+01 |
| Station 09A** | < 1.12E+02 | < 4.26E+01 | 1.18E+04 +/- 1.24E+03 | 1.76E+02 +/- 6.58E+01 | < 8.22E+01 |
| Station 11 | < 9.30E+01 | < 3.07E+01 | 1.79E+04 +/- 1.35E+03 | < 5.08E+01 | < 5.87E+01 |

| 10/18/2010 | Ra-226 | Th-228 | Th-232 |
|---|---|---|---|
| Station 08 | 2.95E+03 +/- 1.01E+03 | 1.52E+03 +/- 1.45E+02 | 1.54E+03 +/- 1.61E+02 |
| Station 09A** | < 1.54E+03 | 6.72E+02 +/- 8.66E+01 | 5.86E+02 +/- 1.71E+02 |
| Station 11 | 2.04E+03 +/- 9.08E+02 | 1.27E+03 +/- 1.03E+02 | 1.23E+03 +/- 1.59E+02 |

MEAN

| | Sr-89 | Sr-90 | K-40 | Cs-134* | Cs-137* |
|---|---|---|---|---|---|
| Indicator | +/- | +/- | 1.29E+04 +/- 1.03E+03 | +/- | 1.00E+02 +/- 4.60E+01 |
| Control | +/- | +/- | 1.21E+04 +/- 1.09E+03 | 1.76E+02 +/- 5.18E+01 | 1.55E+02 +/- 6.39E+01 |

| | Ra-226 | Th-228 | Th-232 |
|---|---|---|---|
| Indicator | 2.13E+03 +/- 8.13E+02 | 1.08E+03 +/- 8.89E+01 | 1.06E+03 +/- 1.23E+02 |
| Control | 2.76E+03 +/- 1.24E+03 | 8.02E+02 +/- 7.44E+01 | 7.13E+02 +/- 1.49E+02 |

* LLD identified in ODCM

** Control Station

[a] Sr-89/90 analyses performed annually.

# Table 3-14
## Shoreline Soil
## Gamma Spectra, and Strontium
[pCi/Kg]



| Sample Date | Sr-89 | Sr-90 | K-40 | Cs-134 | Cs-137 |
|---|---|---|---|---|---|
| 04/19/2010 | | | | | |
| Station 08 | [a] | [a] | 9.35E+03 +/- 8.17E+02 | < 3.44E+01 | < 4.26E+01 |

| Ra-226 | Th-228 | Th-232 |
|---|---|---|
| 1.67E+03 +/- 8.18E+02 | 1.27E+03 +/- 7.66E+01 | 1.11E+03 +/- 1.14E+02 |

| Sample Date | Sr-89 | Sr-90 | K-40 | Cs-134 | Cs-137 |
|---|---|---|---|---|---|
| 10/18/2010 | | | | | |
| Station 08 | < 9.31E+01 | < 3.28E+01 | 2.77E+03 +/- 9.23E+02 | < 5.94E+01 | < 6.79E+01 |

| Ra-226 | Th-228 | Th-232 |
|---|---|---|
| 1.35E+03 +/- 1.11E+03 | 8.62E+02 +/- 1.02E+02 | 8.94E+02 +/- 1.94E+02 |

MEAN

| Sr-89 | Sr-90 | K-40 | Cs-134 | Cs-137 |
|---|---|---|---|---|
| +/- | +/- | 6.06E+03 +/- 8.70E+02 | +/- | +/- |

| Ra-226 | Th-228 | Th-232 |
|---|---|---|
| 1.51E+03 +/- 9.64E+02 | 1.07E+03 +/- 8.93E+01 | 1.00E+03 +/- 1.54E+02 |

* LLD identified in ODCM
[a] Sr-89/90 analyses performed annually.

# Table 3-15
## Fish
## Gamma Spectra
[pCi/Kg]



Fish [a]

| Sampling Date | K-40 | | | Mn-54* | Fe-59* | Co-58* | Co-60* | Zn-65* | Cs-134* | Station 08 Cs-137* |
|---|---|---|---|---|---|---|---|---|---|---|
| 04/21/10 | 2.45E+03 | +/- | 9.29E+02 | < 5.52E+01 | < 1.72E+02 | < 7.39E+01 | < 6.51E+01 | < 1.21E+02 | < 5.14E+01 | < 6.37E+01 |
| 10/21/10 | 2.13E+03 | +/- | 9.16E+02 | < 5.53E+01 | < 1.21E+02 | < 7.30E+01 | < 5.90E+01 | < 1.48E+02 | < 6.63E+01 | < 6.50E+01 |

| Sampling Date | K-40 | | | Mn-54* | Fe-59* | Co-58* | Co-60* | Zn-65* | Cs-134* | Station 25** Cs-137* |
|---|---|---|---|---|---|---|---|---|---|---|
| 04/20/10 | 1.61E+03 | +/- | 6.43E+02 | < 4.51E+01 | < 1.31E+02 | < 4.33E+01 | < 3.57E+01 | < 9.67E+01 | < 3.60E+01 | < 4.99E+01 |
| 10/19/10 | 3.05E+03 | +/- | 1.05E+03 | < 7.82E+01 | < 1.58E+02 | < 7.83E+01 | < 8.87E+01 | < 1.47E+02 | < 6.33E+01 | < 8.27E+01 |

catfish [b]

| Sampling Date | K-40 | | | Mn-54* | Fe-59* | Co-58* | Co-60* | Zn-65* | Cs-134* | Station 08 Cs-137* |
|---|---|---|---|---|---|---|---|---|---|---|
| 04/21/10 | 2.23E+03 | +/- | 8.82E+02 | < 5.81E+01 | < 1.43E+02 | < 6.65E+01 | < 5.03E+01 | < 1.29E+02 | < 5.14E+01 | < 6.24E+01 |
| 10/21/10 | 2.08E+03 | +/- | 6.21E+02 | < 5.32E+01 | < 1.13E+02 | < 5.44E+01 | < 4.95E+01 | < 1.11E+02 | < 5.42E+01 | < 5.60E+01 |

| Sampling Date | K-40 | | | Mn-54* | Fe-59* | Co-58* | Co-60* | Zn-65* | Cs-134* | Station 25** Cs-137* |
|---|---|---|---|---|---|---|---|---|---|---|
| 04/20/10 | 2.20E+03 | +/- | 5.76E+02 | < 1.72E+01 | < 4.12E+01 | < 1.92E+01 | < 1.81E+01 | < 3.27E+01 | < 1.36E+01 | < 1.77E+01 |
| 10/19/10 | 2.18E+03 | +/- | 1.04E+03 | < 6.87E+01 | < 1.76E+02 | < 7.65E+01 | < 6.95E+01 | < 1.28E+02 | < 5.93E+01 | < 6.45E+01 |

| | | | |
|---|---|---|---|
| Mean | 2.24E+03 | +/- | 8.32E+02 |
| Indicator | 2.22E+03 | +/- | 8.37E+02 |
| Control | 2.26E+03 | +/- | 8.27E+02 |

* LLD identified in ODCM

** Control Station

[a] Non-bottom dwelling species of gamefish.

[b] Bottom dwelling species of fish.

# 4. DISCUSSION OF RESULTS

Data from the radiological analyses of environmental media collected during 2010 and tabulated in Section 3, are discussed below. Except for TLDs, TBE analyzed all samples throughout the year. The procedures and specifications followed for these analyses are as required in the TBE quality assurance manuals and laboratory procedures. In addition to internal quality control measurements performed by each laboratory, they also participate in an Interlaboratory Comparison Program. Participation in this program ensures that independent checks on the precision and accuracy of the measurements of radioactive material in environmental samples are performed. The results of the Interlaboratory Comparison Programs are provided in Appendix B.

The predominant radioactivity detected throughout 2010 was that from external sources, such as fallout from nuclear weapons tests and naturally occurring radionuclides. Naturally occurring nuclides such as Be-7, K-40, Th-228 and Th-232 were detected in numerous samples. Th-228 & Th-232 results were variable and are generally at levels higher than plant related radionuclides.

The following is a discussion and summary of the results of the environmental measurements taken during the 2010 reporting period.

## *4.1 Gamma Exposure Rate*

A thermoluminescent dosimeter (TLD) is an inorganic crystal used to detect ambient radiation. TLDs are placed in two concentric rings around the station. The inner ring is located at the site boundary, and the outer ring is located at approximately five miles from the station. TLDs are also placed in special interest areas, such as population areas and nearby residences. Additional TLDs serve as controls. Ambient radiation comes from naturally occurring radioisotopes in the air and soil, radiation from cosmic origin, fallout from nuclear weapons testing, station effluents and direct radiation from the station.

The results of the analyses are presented in Table 3-2. Figure 4-1 shows the historical trend of TLD exposure rate measurements. Control and indicator averages indicate a steady relationship. Two dosimeters made of CaF and LiF sensitive elements are deployed at each sampling location. These TLDs replaced the previously used CaSO4:Dy in Teflon TLDs in January 2001. The dose with the replacement TLDs is lower than that of the previously used TLDs. This will continue to be monitored.

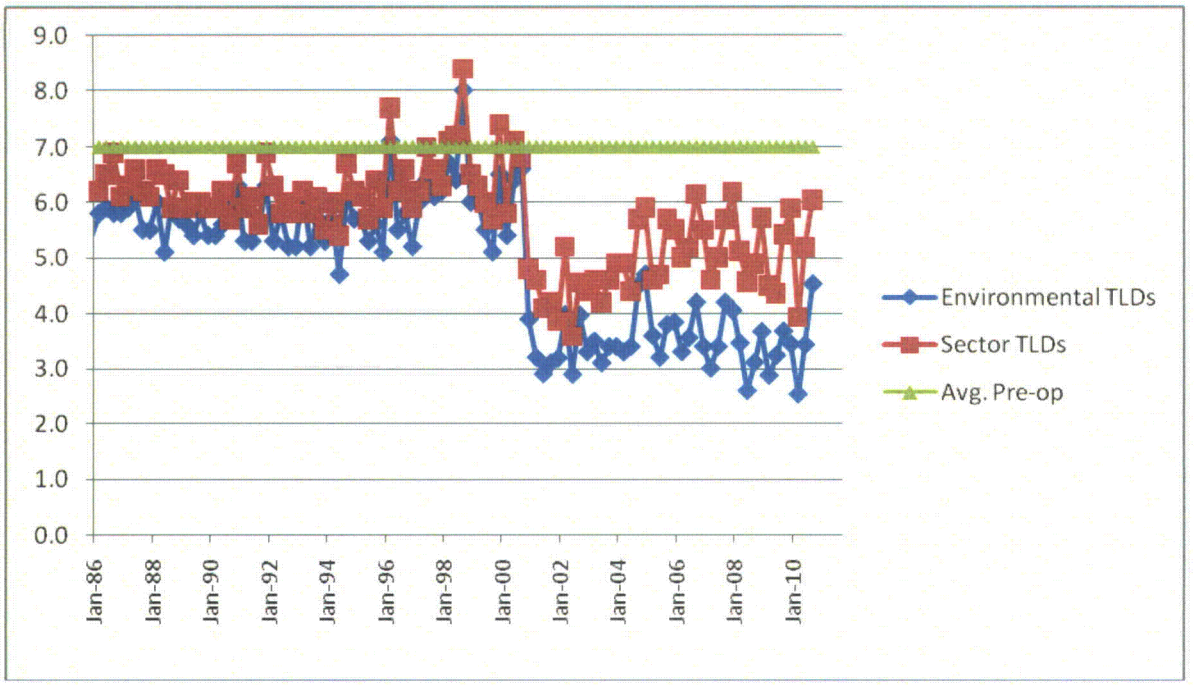


***Figure 4-1 TLD (mrem/Standard Month)***

Sector TLDs are deployed quarterly at thirty-two locations in the environs of the North Anna site. Two badges are placed at each location. The average level of the 32 locations (two badges at each location) was 5.3 mR/standard month with a range of 0.9 to 39.2 mR/standard month. The highest quarterly average reading for any single location was obtained at location SSW-19/51. This value was 27.9 mR/standard month. This location is on site directly across the access road from the Independent Spent Fuel Storage Facility. The higher values can thus be attributed to the spent fuel stored in the ISFSI. Quarterly and annual TLDs are also located at each of the twelve environmental air sampling stations. For the eleven indicator locations within 10 miles of the station the average quarterly reading was 3.5 mR/standard month with a range of 1.5 to 6.4 mR/standard month. The average annual reading for these locations was 3.4 mR/standard month with a range of from 2.2 to 5.1 mR/standard month. The control location showed a quarterly average of 3.3 mR/standard month with a range of 2.0 to 4.9 mR/standard month. Its annual reading was 2.6 mR/standard month. 10 emergency sector TLDs, which are all located onsite had a quarterly average of 5.3 mR/standard month with EPSP-9/10 having the highest quarterly average of 7.5 mR/standard month. Eight other TLDs, designated C-1 thru C-8, which were pre-operational controls, were collected quarterly from four locations. Stations C-3/4 and C-7/8 are designated controls. These had a quarterly average of 3.4, while Station C-1/2 and C-5/6 had a quarterly average of 2.6 mR/standard month with a range of 1.7 to 3.7 mR/standard month. During the pre-operational period (starting in 1977) the doses were measured between 4.3 and 8.8 mR/standard

month.

## *4.2 Airborne Gross Beta*

Results of the weekly gross beta analyses are presented in Table 3-3. A review of the historical plot in Figure 4-2, indicates gross beta activity levels have remained relatively unchanged. The drop indicated in 2010 may be a function a return to the vendor used from 1988 until 2001. This will be monitored in the future to see if this in fact the case. Inner and outer ring monitoring locations continue to show no significant variation in measured activities (see Figure 4-3). This indicates that any station contribution is not measurable.

Gross beta activity found during the pre-operational and early operating period of North Anna Power Station was higher because of nuclear weapons testing. During that time, nearly 740 nuclear weapons were tested worldwide. In 1985 weapons testing ceased, and with the exception of the Chernobyl accident in 1986, airborne gross beta results have remained steady. During the preoperational period of July 1, 1974 through March 31, 1978 gross beta activities ranged from a low of 0.005 $pCi/m^3$ to a high of 0.75 $pCi/m^3$.

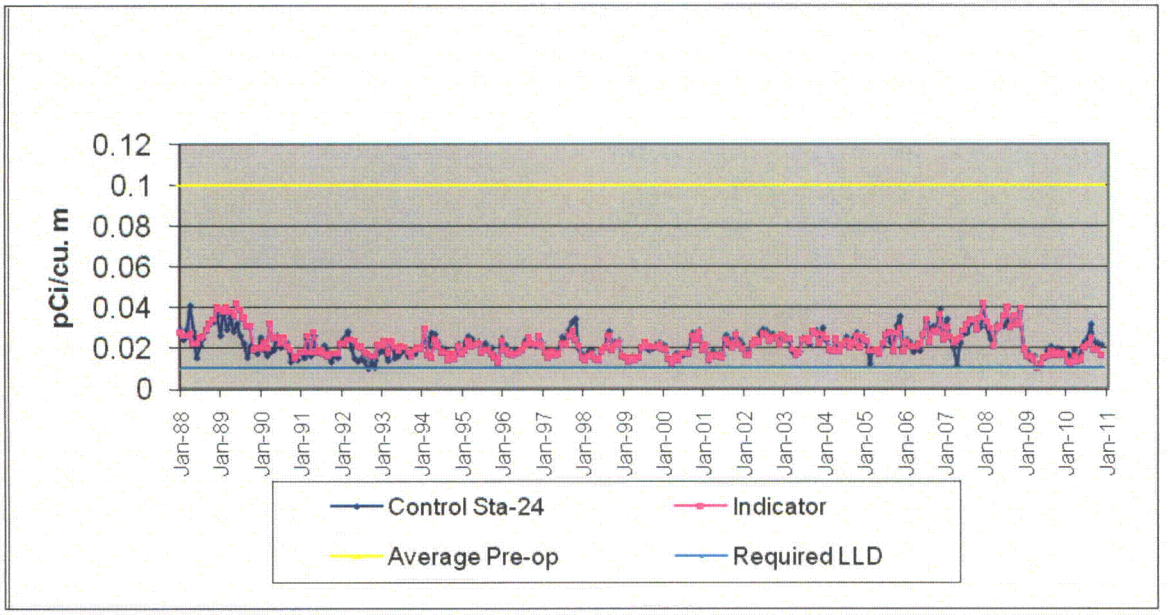


***Figure 4-2 Historical Gross Beta in Air Particulates***

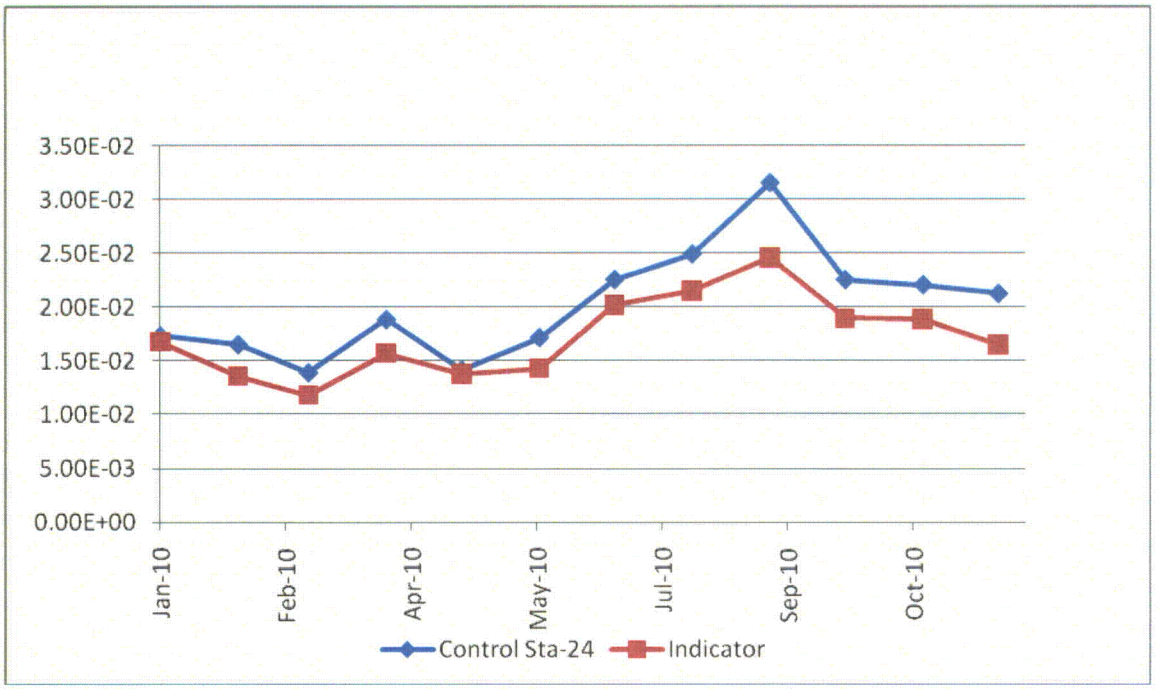


*Figure 4-3 2010 Gross Beta in Air Particulates (pCi/m$^3$)*

## *4.3 Airborne Radioiodine*

Charcoal cartridges are used to collect airborne radioiodine. Once a week the samples are collected and analyzed. The results of the analyses are presented in Table 3-4. These results are similar to pre-operational data and the results of samples taken prior to and after the 1986 accident in the Soviet Union at Chernobyl.

## *4.4 Air Particulate Gamma*

The air particulate filters that are utilized for the weekly gross beta analyses are composited by location and analyzed quarterly by gamma spectrometry. The results are listed in Table 3-5. The results indicate the presence of naturally occurring Be-7, which is produced by cosmic processes. Examination of pre-operational data indicates comparable measurements of Be-7, as would be expected. The results of these analyses indicate the lack of station effects on the environment.

## *4.5 Air Particulate Strontium*

Strontium-89 and 90 analyses are performed on the second quarter composites of air particulate filters from all monitoring stations. There has been no detection of

these fission products at any of the indicator or control stations in recent years.

### *4.6 Soil*

Soil samples, which are collected every three years from twelve stations, were collected in 2007 and thus were collected in 2010. Cs-137 was identified in several samples. For the indicator stations the average was 283 pCi/Kg while for the control station the average was 223 pCi/Kg. During the preoperational phase Cs-137 was routinely detected and was attributed to fallout. Levels during this phase varied by location and date and ranged from 88 to 1390 pCi/Kg. The average was 645 pCi/kg. The current levels are also varied significantly by location and date. The decrease in the average and the fact that the averages for the control location and the indicator locations are similar is indicative of fallout. Cs-134 was detected in three samples, but these are considered false positives since the peak was not identified during the analysis, but the force activity calculation resulted in an activity concentration that exceeded the $2\sigma$ value and the MDC.

### *4.7 Precipitation*

A sample of rain water was collected monthly at on-site station 01A and analyzed for gross beta activity. The results are presented in Table 3-7. 12 precipitation samples were obtained in 2010. Semi-annual composites are prepared and analyzed for gamma emitting isotopes in accordance with program requirements. No positive indications of plant related gamma emitting radioisotopes were observed in 2010. Naturally occurring gamma emitting radioisotopes were detected. During the pre-operational period gross beta activity in rain water was expressed in nCi per square meter of the collector surface, thus a direct comparison cannot be made to the 2010 period. During the pre-operational period, tritium was measured in over half of the few quarterly composites made. This tritium activity ranged from 100 to 330 pCi/liter.

### *4.8 Cow Milk*

Analysis of milk samples is generally the most sensitive indicator of fission product existence in the terrestrial environment. This pathway also shows measurable amounts of nuclear weapons testing fallout. Therefore, this media needs to be evaluated very carefully when trying to determine if there is any plant effect.

Analysis results for cow milk are contained in Table 3-8. All results show no

detectable I-131 above the LLD of 1 pCi/l. Results of gamma ray spectroscopy did not detect the presence of any plant related isotopes. In years past, Cs-137 has been detected sporadically. The occurrences were attributed to residual global fallout from past atmospheric weapons testing. Naturally occurring K-40 was detected in all samples.

Once each quarter a sample from each of the two collection stations is analyzed for strontium-89 and strontium-90. Neither Sr-89 nor Sr-90 was detected. Sr-90 has been observed in the past. Pre-operational levels of 2.2 to 5.4 pCi/liter were measured for Sr-90. There has been a long-term activity trend for Sr-90 showing a continuous decline. It should be noted that strontium-90 is not a part of station effluents. Its detection is the product of nuclear weapons testing fallout. This conclusion can be made based upon the fact that Sr-89 and Sr-90 have not been detected in gaseous effluents released from the station in many years, and the trend of consistent declining levels since the pre-operational period.

### *4.9 Food Products and Vegetation*

Food/vegetation samples were collected from five locations and analyzed by gamma spectrometry. The results of the analyses are presented in Table 3-9. Low levels of Cs-137, attributable to fallout, have been seen periodically in vegetation samples. As expected, naturally occurring potassium-40 and, cosmogenic beryllium-7 were detected in most samples, and thorium-228 and other natural products, including Bi-214, were detected in some samples.

### *4.10 Well Water*

Water was sampled quarterly from the onsite well at the metrology laboratory. These samples were analyzed for gamma radiation and for tritium. The second quarter sample was analyzed for strontium-89 and strontium-90. The results of these analyses are presented in Table 3-10. No plant related isotopes were detected. No gamma emitting isotopes were detected during the pre-operational period.

### *4.11 River Water*

A sample of water from the North Anna River was collected monthly. The analyses are presented in Table 3-11. All monthly samples are analyzed by gamma spectroscopy. The monthly samples were composited quarterly and analyzed for tritium. Additionally, the second quarter samples are analyzed for strontium-89 and strontium-90 in accordance with program requirements. There has been no detection of these fission products at any of the indicator or control stations in

recent years.

No gamma emitting radioisotopes were detected in any of the samples. There was no measured activity of strontium-89 or strontium-90. Tritium was measured in all four samples with an average annual concentration of 3510 pCi/liter and a range of 2250 to 4660 pCi/liter. These levels are comparable to those observed in previous years, see Figure 4-4. No river water samples were collected during the pre-operational period.

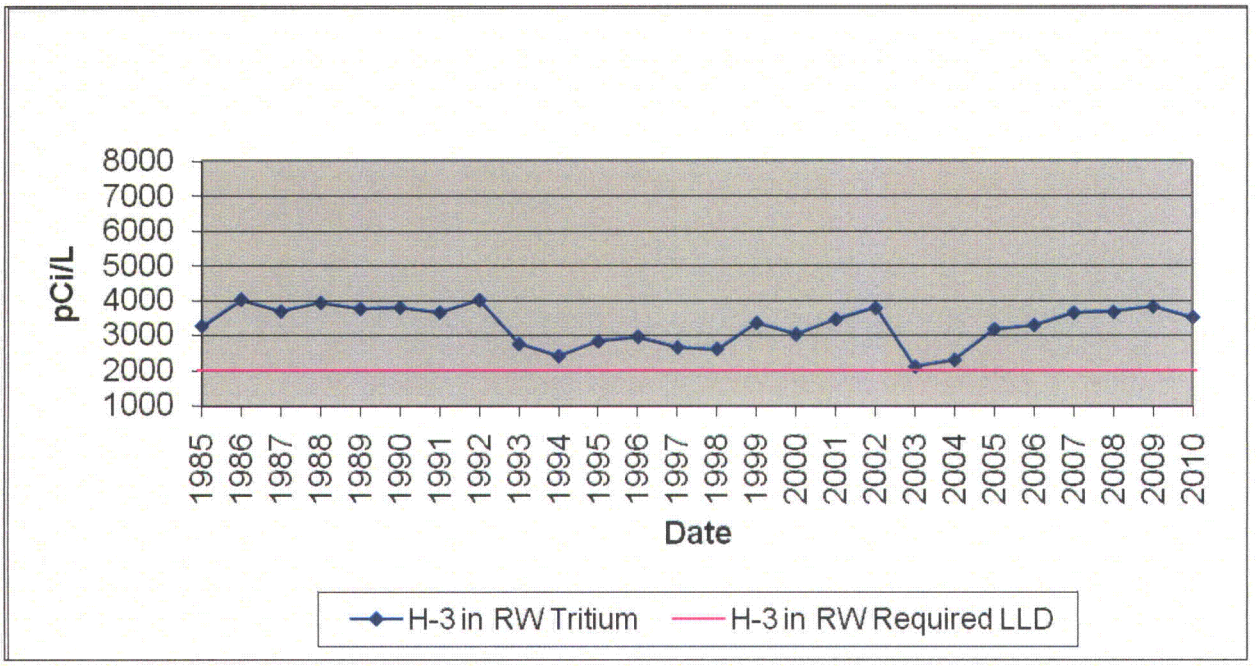


*Figure 4-4Tritium in River water*

## *4.12 Surface Water*

Samples of surface water were collected monthly from two stations, an indicator station located at the discharge lagoon and a control station located 12.9 miles WNW. The samples were analyzed by gamma ray spectrometry and for iodine-131 by radiochemical separation. A quarterly composite from each station was prepared and analyzed for tritium. Additionally, the second quarter samples are analyzed for strontium-89 and strontium-90. There has been no positive indication of these fission products at any of the indicator or control stations in recent years. The results are presented in Table 3-12.

Nb-95 was reported in one surface water sample at the indicator location.

However, the peak was not identified, but forced activity concentration calculation exceeded MDC and the 2 sigma error. No other non-naturally occurring gamma emitting radioisotopes, including iodine were detected in any of the other samples. No tritium was detected at the control location. The average level of tritium activity at the indicator station was 3100 pCi/liter with a range of 2340 to 4060 pCi/liter. Levels of tritium have increased since 1978 when the average level was below 300 pCi/liter. Levels measured at the indicator location (Station 8) are comparable to those measured since 1986, see Figure 4-5. During the pre-operational period tritium was measured in several samples with concentrations between 90 and 250 pCi/liter.

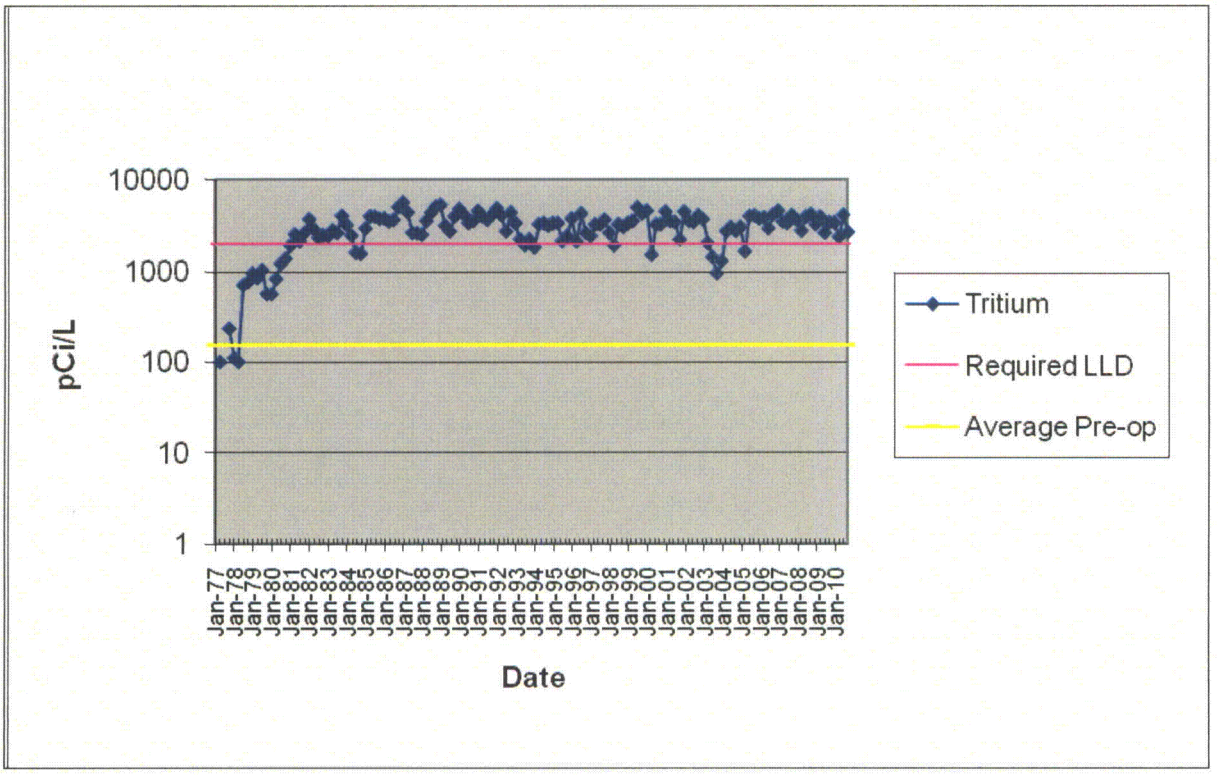


*Figure 4.5Tritium in Surface Water*

## *4.13 Bottom Sediment*

Bottom sediment or silt is sampled to evaluate any buildup of radionuclides in the environment due to the operation of the station. Buildup of radionuclides in bottom sediment could indirectly lead to increasing radioactivity levels in fish.

Sediment samples were collected during March and October from each of three locations and were analyzed by gamma spectrometry. The October samples were analyzed for strontium-89 and strontium-90. The results are presented in Table 3-13. Figure 4-6 shows the historical trend of Cs-137 in sediments.

In 2010, one (1) sediment sample from an indicator location showed Cs-137 at 100 pCi/kg. Cs-137 was also detected at 155 pCi/Kg in one (1) sample at the control location in 2010. Cs-134 was detected in one sample location, the control location, at 176 pCi/kg. However, this is considered a false positive as its peak was not detected during the analysis, but its forced activity concentration exceeded MDC and the 2 sigma error. The detection of Cs-137 in bottom sediment is historically common with positive indications usually apparent in both indicator and control samples. The detection of Cs-137 is the result of accumulation and runoff into the lake of residual weapons testing fallout; its global presence has been well documented. During the pre-operational period sediment samples were also analyzed by gamma ray spectroscopy.

Neither Strontium-89 nor Strontium-90 was detected any samples of aquatic sediment/silt in 2010. Strontium-90 has been detected occasionally in the past at both the indicator and control locations and is attributable to fallout from past bomb tests. A number of naturally occurring radioisotopes were detected in these samples at background levels.

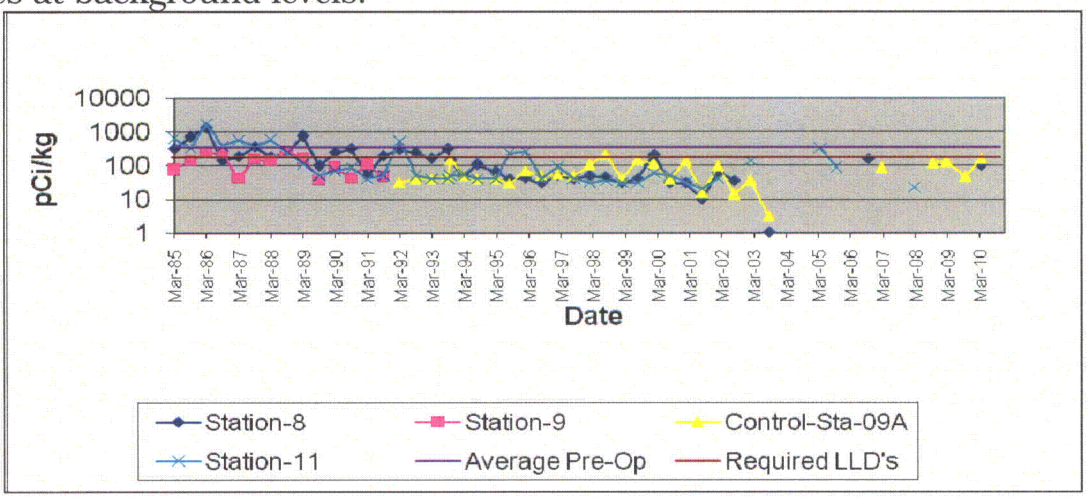


*Figure 4-6 Cs-137 in Sediment/Silt*

## *4.14 Shoreline Soil*

Shoreline soil/sediment, unlike bottom sediment, may provide a direct dose to humans. Buildup of radioisotopes along the shoreline may provide a source of direct exposure for those using the area for commercial and recreational uses. Samples of shoreline soil were collected in April and October from indicator station 08. The samples were analyzed by gamma ray spectrometry. The October sample was analyzed for strontium-89 and strontium-90. The results are presented in Table 3-14.

Naturally occurring radioisotopes were detected at concentrations equivalent to normal background activities. No plant related isotopes were detected in the two samples analyzed. Strontium-90 is often detected in this media, however as discussed previously, the presence of Sr-90 and Cs-137 is attributed to accumulation of residual global fallout from past atmospheric weapons testing.

### *4.15 Fish*

Four sample sets of fish, two from Lake Anna and two from the control station, Lake Orange, were collected during 2010 and analyzed by gamma spectroscopy. Each sample set consisted of a sample of game species and a sample of bottom-dwelling species, which were analyzed separately. The results are presented in Table 3-15. Naturally occurring K-40 was detected in all samples. No plant related isotopes were detected. Cs-137 was measured in pre-operational environmental fish samples.

# 5. PROGRAM EXCEPTIONS

REMP Exceptions for Scheduled Sampling and Analysis During 2010 – North Anna

| Location | Description | Date of Sampling | Reason(s) for Loss/Exception |
|---|---|---|---|
| 14A,15,16,23, 26 | Vegetation | 01/12/10 | Seasonal unavailability |
| 13 | Milk | 01/19/10 | Sold cows. No longer operating as dairy |
| 14A,15,16,23, 26 | Vegetation | 02/09/10 | Seasonal unavailability |
| 13 | Milk | 02/16/10 | Sold cows. No longer operating as dairy |
| 14A,15,16,23, 26 | Vegetation | 03/09/10 | Seasonal unavailability |
| 13 | Milk | 03/16/10 | Sold cows. No longer operating as dairy |
| 05 | AP/Charcoal | 03/31/10 | Lost power to sampler due to breaker failure. No sample collected |
| 14A,15,16,23, 26 | Vegetation | 04/13/10 | Seasonal unavailability |
| 13 | Milk | 04/20/10 | Sold cows. No longer operating as dairy |
| 14A,15,16,23, 26 | Vegetation | 11/09/10 | Seasonal unavailability |
| 14A,15,16,23, 26 | Vegetation | 12/14/10 | Seasonal unavailability |

# REFERENCES

## *References*


1. Dominion, North Anna Power Station Technical Specifications, Units 1 and 2.

2. Dominion, North Anna Power Station Independent Spent Fuel Storage Installation Technical Specifications.

3. Dominion, Station Administrative Procedure, VPAP-2103N, "Offsite Dose Calculation Manual".

4. Virginia Electric and Power Company, North Anna Technical Procedure, HP-3051.010, "Radiological Environmental Monitoring Program".

5. Title 10 Code of Federal Regulation, Part 50 (10CFR50), "Domestic Licensing of Production and Utilization Facilities".

6. United States Nuclear Regulatory Commission Regulatory Guide 1.109, Rev. 1, "Calculation of Annual Doses to Man from Routine Releases of Reactor Effluents for the Purpose of Evaluating Compliance with 10CFR50, Appendix I", October, 1977.

7. United States Nuclear Regulatory Commission, Regulatory Guide 4.8 "Environmental Technical Specifications for Nuclear Power Plants", December 1975.

8. USNRC Branch Technical Position, "Acceptable Radiological Environmental Monitoring Program", Rev. 1, November 1979.

9. NUREG 0472, "Radiological Effluent Technical Specifications for PWRs", Rev. 3, March 1982.

10. "Technical Specifications for North Anna Independent Spent Fuel Storage Installation (ISFSI)".

11. HASL-300, Environmental Measurements Laboratory, "EML Procedures Manual," 27th Edition, Volume 1, February 1992.

12. NUREG/CR-4007, "Lower Limit of Detection: Definition and Elaboration of a Proposed Position for Radiological Effluent and Environmental Measurements," September 1984.

# APPENDICES

# APPENDIX A: LAND USE CENSUS

**Year 2010**

# LAND USE CENSUS

**North Anna Power Station**
**North Anna County, Virginia**

*January 1 to December 31, 2010*

| Direction | Distance *(miles)* | | | | | |
|---|---|---|---|---|---|---|
| | Nearest Site Boundary | Nearest Resident | Nearest Garden (> 50m$^2$) | Nearest Meat Animal | Nearest Milch Cow | Nearest Milch Goat |
| **N** | 0.9 | 1.3 | 1.9 | 2.9 | NONE | NONE |
| **NNE** | 0.9 | 0.9 | 1.7 | 3.1 | NONE | NONE |
| **NE** | 0.8 | 0.9 | 1.6 | 1.6 | NONE | NONE |
| **ENE** | 0.8 | 2.2 | 2.4 | 2.7 | NONE | NONE |
| **E** | 0.8 | 1.3 | 2.0 | 3.5 | NONE | NONE |
| **ESE** | 0.9 | 1.7 | 1.7 | 4.9 | NONE | NONE |
| **SE** | 0.9 | 1.4 | 1.5 | 1.4 | NONE | NONE |
| **SSE** | 0.9 | 1.0 | 1.0 | 1.6 | NONE | NONE |
| **S** | 0.9 | 1.0 | 1.0 | 2.0 | NONE | NONE |
| **SSW** | 1 | 1.3 | 3.1 | 2.0 | NONE | NONE |
| **SW** | 1.1 | 1.7 | 3.0 | NONE | NONE | NONE |
| **WSW** | 1.1 | 1.6 | 2.4 | 1.6 | NONE | NONE |
| **W** | 1.1 | 1.5 | 1.5 | 4.4 | NONE | NONE |
| **WNW** | 1 | 1.1 | 2.6 | 5.0 | NONE | NONE |
| **NW** | 1 | 1.0 | 2.0 | NONE | NONE | NONE |
| **NNW** | 0.9 | 1.0 | 2.2 | NONE | NONE | NONE |

| 2009 to 2010 Land Use Census Changes | | | |
|---|---|---|---|
| **Nearest** | **Direction** | **2009 Distance** | **2010 Distance** |
| **Site Boundary** | NONE | | |
| **Resident** | N | 1.5 | 1.3 |
| Garden | | | |
| | NNE | 3.1 | 1.7 |
| | SE | 1.0 | 1.5 |
| | SSW | 3.7 | 3.1 |
| | WSW | NONE | 2.4 |
| | W | 1.8 | 1.5 |
| | NW | NONE | 2.0 |
| **Meat Animal** | N | NONE | 2.9 |
| | NNE | 1.5 | 3.1 |
| | NE | 1.5 | 1.6 |
| | ENE | 2.5 | 2.7 |
| | ESE | NONE | 4.9 |
| | SE | 1.5 | 1.4 |
| | SSE | 2.8 | 1.6 |
| | S | 2.8 | 2.0 |
| | SSW | 1.9 | 2.0 |
| | W | NONE | 4.4 |
| | WNW | 3.9 | 5.0 |
| **Milch Cow** | NONE | | |
| **Milch Goat** | NONE | | |

# APPENDIX B: SUMMARY OF INTERLABORATORY COMPARISONS

## YEAR 2010

## *INTRODUCTION*

This appendix covers the Intercomparison Program of the Teledyne Brown Engineering – Environmental Services as required by technical specifications for the Radiological Environmental Monitoring Program (REMP). TBE uses QA/QC samples provided by Eckert & Zeigler Analytics, Inc, DOE's Mixed Analyte Performance Evaluation Program (MAPEP) and Environmental Resource Associates, (ERA) to monitor the quality of analytical processing associated with the REMP. The suite of samples is designed to be comparable with the pre-1996 US EPA Interlaboratory Cross-Check Program in terms of sample number, matrices, and nuclides. This includes:

E & Z Analytics:

- Milk for gamma emitters, Iodine-131, Fe-55, Sr-89 and Sr-90 analyses once per quarter.
- Air particulate for gamma emitters once per quarter
- Charcoal for I-131 once per quarter

DOE

- Water and soil for gamma, Iodine-131, U-233/234, U-238, transuranics, tritium, Fe-55, Ni-63, Sr-90 and Tc-99 analyses during the 1st quarter.
- Water for gross alpha and beta during the 1st and 3rd quarters
- Air particulates and vegetation for gamma, Iodine-131, U-233/234, U-238, transuranics, Sr-90 analyses during the 1st and 3rd quarters
- Air filter for gross alpha and beta analyses during the 1st and 3rd quarters.

ERA

- Water for tritium, gamma, Iodine-131, Sr-89, Sr-90, gross alpha and beta during the 2nd and 4th quarters.
- Water for natural uranium during the 2nd quarter

## *RESULTS*

Interlaboratory comparison program results are evaluated using TBE#'s criterion. Any sample analysis result that does not pass the criteria is investigated by TBE. The following Nonconformance Reports were generated and corrective actions taken as a result of this program.

NCR 10-09- Failure of Zn-65 in water was not a failure, but due to a typographical error in reporting the data. Corrective action is data will be reviewed more carefully.

Sr-89 result was evaluated as a failure based on the acceptance range of 55.8-76.7. The TBE to ERA ratio was 1.14 based on the known value of 68.5. Since the result is within 20% of the known, this is not considered a

failure by TBE. No corrective action necessary.

NCR 11-01 Failed MAPEP Series 23 water Pu-238 and Pu-239/240. At the time of this report this item is still under investigation. The results of the investigation and corrective action will be included in next year's report.

A summary of TBE's results is provided in the tables on the following pages for the required sample matrix types and isotopic distribution. Delineated in the table for each of the media/analysis combinations, are: the specific radionuclide; its result; analytical date; the known values supplied by the providers; pass or fail criteria.

## ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM
## TELEDYNE BROWN ENGINEERING ENVIRONMENTAL SERVICES



| Month/Year | Identification Number | Matrix | Nuclide | Units | Reported Value (a) | Known Value (b) | Ratio (c) TBE/Analytics | Evaluation (d) |
|---|---|---|---|---|---|---|---|---|
| March 2010 | E6978-396 | Milk | Sr-89 | pCi/L | 89.3 | 92.8 | 0.96 | A |
| | | | Sr-90 | pCi/L | 13.8 | 12.7 | 1.09 | A |
| | E6979-396 | Milk | I-131 | pCi/L | 65.2 | 74.0 | 0.88 | A |
| | | | Ce-141 | pCi/L | 241 | 261 | 0.92 | A |
| | | | Cr-51 | pCi/L | 388 | 361 | 1.07 | A |
| | | | Cs-134 | pCi/L | 157.0 | 178 | 0.88 | A |
| | | | Cs-137 | pCi/L | 150 | 158 | 0.95 | A |
| | | | Co-58 | pCi/L | 143 | 143 | 1.00 | A |
| | | | Mn-54 | pCi/L | 202 | 207 | 0.98 | A |
| | | | Fe-59 | pCi/L | 146 | 137 | 1.07 | A |
| | | | Zn-65 | pCi/L | 247 | 254 | 0.97 | A |
| | | | Co-60 | pCi/L | 177 | 183 | 0.97 | A |
| | E6981-396 | AP | Ce-141 | pCi | 211 | 185 | 1.14 | A |
| | | | Cr-51 | pCi | 304 | 255 | 1.19 | A |
| | | | Cs-134 | pCi | 142 | 125 | 1.14 | A |
| | | | Cs-137 | pCi | 131 | 111 | 1.18 | A |
| | | | Co-58 | pCi | 119 | 101 | 1.18 | A |
| | | | Mn-54 | pCi | 162 | 146 | 1.11 | A |
| | | | Fe-59 | pCi | 110 | 97 | 1.14 | A |
| | | | Zn-65 | pCi | 217 | 179 | 1.21 | W |
| | | | Co-60 | pCi | 145 | 129 | 1.12 | A |
| | E6980-396 | Charcoal | I-131 | pCi | 80.2 | 85.6 | 0.94 | A |
| | E6982-396 | Water | Fe-55 | pCi/L | 2490 | 1970 | 1.26 | W |
| June 2010 | E7132-396 | Milk | Sr-89 | pCi/L | 82.0 | 93.4 | 0.88 | A |
| | | | Sr-90 | pCi/L | 15.8 | 16.7 | 0.95 | A |
| | E7133-396 | Milk | I-131 | pCi/L | 83.5 | 96.9 | 0.86 | A |
| | | | Ce-141 | pCi/L | 107 | 110 | 0.97 | A |
| | | | Cr-51 | pCi/L | 325 | 339 | 0.96 | A |
| | | | Cs-134 | pCi/L | 114.0 | 126 | 0.90 | A |
| | | | Cs-137 | pCi/L | 144 | 150 | 0.96 | A |
| | | | Co-58 | pCi/L | 92.3 | 101 | 0.91 | A |
| | | | Mn-54 | pCi/L | 165 | 169 | 0.98 | A |
| | | | Fe-59 | pCi/L | 121 | 119 | 1.02 | A |
| | | | Zn-65 | pCi/L | 197 | 206 | 0.96 | A |
| | | | Co-60 | pCi/L | 190 | 197 | 0.96 | A |

## ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM
## TELEDYNE BROWN ENGINEERING ENVIRONMENTAL SERVICES



| Month/Year | Identification Number | Matrix | Nuclide | Units | Reported Value (a) | Known Value (b) | Ratio (c) TBE/Analytics | Evaluation (d) |
|---|---|---|---|---|---|---|---|---|
| | E7135-396 | AP | Ce-141 | pCi | 88.4 | 91.6 | 0.97 | A |
| | | | Cr-51 | pCi | 292 | 282 | 1.04 | A |
| | | | Cs-134 | pCi | 101 | 105 | 0.96 | A |
| | | | Cs-137 | pCi | 132 | 125 | 1.06 | A |
| | | | Co-58 | pCi | 87.3 | 84.0 | 1.04 | A |
| | | | Mn-54 | pCi | 150 | 140 | 1.07 | A |
| | | | Fe-59 | pCi | 105 | 98.6 | 1.06 | A |
| | | | Zn-65 | pCi | 168 | 171 | 0.98 | A |
| | | | Co-60 | pCi | 170 | 163 | 1.04 | A |
| | E7134-396 | Charcoal | I-131 | pCi | 76.4 | 79.9 | 0.96 | A |
| June 2010 | E7136-396 | Water | Fe-55 | pCi/L | 1710 | 1880 | 0.91 | A |
| September 2010 | E7229-396 | Milk | Sr-89 | pCi/L | 85.0 | 92.8 | 0.92 | A |
| | | | Sr-90 | pCi/L | 12.6 | 14.7 | 0.86 | A |
| | E7230-396 | Milk | I-131 | pCi/L | 80.2 | 94.1 | 0.85 | A |
| | | | Ce-141 | pCi/L | 130 | 130 | 1.00 | A |
| | | | Cr-51 | pCi/L | 235 | 234 | 1.00 | A |
| | | | Cs-134 | pCi/L | 83.2 | 93.0 | 0.89 | A |
| | | | Cs-137 | pCi/L | 95.1 | 94.5 | 1.01 | A |
| | | | Co-58 | pCi/L | 77.3 | 73.7 | 1.05 | A |
| | | | Mn-54 | pCi/L | 121 | 119 | 1.02 | A |
| | | | Fe-59 | pCi/L | 96.4 | 91.1 | 1.06 | A |
| | | | Zn-65 | pCi/L | 216 | 204 | 1.06 | A |
| | | | Co-60 | pCi/L | 172 | 171 | 1.01 | A |
| | E7232-396 | AP | Ce-141 | pCi | 122 | 119 | 1.03 | A |
| | | | Cr-51 | pCi | 228 | 214 | 1.07 | A |
| | | | Cs-134 | pCi | 79.9 | 85.3 | 0.94 | A |
| | | | Cs-137 | pCi | 93.8 | 86.7 | 1.08 | A |
| | | | Co-58 | pCi | 71.5 | 67.6 | 1.06 | A |
| | | | Mn-54 | pCi | 113 | 110 | 1.03 | A |
| | | | Fe-59 | pCi | 73.8 | 83.6 | 0.88 | A |
| | | | Zn-65 | pCi | 186 | 187 | 0.99 | A |
| | | | Co-60 | pCi | 163 | 157 | 1.04 | A |
| | E7231-396 | Charcoal | I-131 | pCi/L | 62.3 | 59.9 | 1.04 | A |
| | E7233-396 | Water | Fe-55 | pCi | 1620 | 1790 | 0.91 | A |

## ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM
## TELEDYNE BROWN ENGINEERING ENVIRONMENTAL SERVICES



| Month/Year | Identification Number | Matrix | Nuclide | Units | Reported Value (a) | Known Value (b) | Ratio (c) TBE/Analytics | Evaluation (d) |
|---|---|---|---|---|---|---|---|---|
| December 2010 | E7375-396 | Milk | Sr-89 | pCi/L | 92.7 | 98.0 | 0.95 | A |
| | | | Sr-90 | pCi/L | 13.5 | 13.5 | 1.00 | A |
| | E7376-396 | Milk | I-131 | pCi/L | 87.9 | 96.9 | 0.91 | A |
| | | | Ce-141 | pCi/L | not provided by Analytics for this study | | | |
| | | | Cr-51 | pCi/L | 389 | 456 | 0.85 | A |
| | | | Cs-134 | pCi/L | 137 | 157 | 0.87 | A |
| | | | Cs-137 | pCi/L | 172 | 186 | 0.92 | A |
| | | | Co-58 | pCi/L | 84.3 | 90.2 | 0.93 | A |
| | | | Mn-54 | pCi/L | 120 | 120 | 1.00 | A |
| | | | Fe-59 | pCi/L | 134 | 131 | 1.02 | A |
| | | | Zn-65 | pCi/L | 162 | 174 | 0.93 | A |
| | | | Co-60 | pCi/L | 284 | 301 | 0.94 | A |
| | E7378-396 | AP | Ce-141 | pCi | not provided by Analytics for this study | | | |
| | | | Cr-51 | pCi | 387 | 365 | 1.06 | A |
| | | | Cs-134 | pCi | 135 | 126.0 | 1.07 | A |
| | | | Cs-137 | pCi | 157 | 149.0 | 1.05 | A |
| | | | Co-58 | pCi | 73.6 | 72.3 | 1.02 | A |
| | | | Mn-54 | pCi | 88.7 | 96.0 | 0.92 | A |
| | | | Fe-59 | pCi | 127 | 105.0 | 1.21 | W |
| | | | Zn-65 | pCi | 151 | 139 | 1.09 | A |
| | | | Co-60 | pCi | 249 | 241 | 1.03 | A |
| December 2010 | E7377-396 | Charcoal | I-131 | pCi | 79.6 | 84.2 | 0.95 | A |
| | E7379-396 | Water | Fe-55 | pCi | 1720 | 1880 | 0.91 | A |

*(a) Teledyne Brown Engineering reported result.*

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

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

*(d) Analytics evaluation based on TBE internal QC limits: A= Acceptable. Reported result falls within ratio limits of 0.80-1.20. W-Acceptable with warning. Reported result falls within 0.70-0.80 or 1.20-1.30. N = Not Acceptable. Reported*

*result falls outside the ratio limits of < 0.70 and > 1.30.*

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



| Month/Year | Identification Number | Media | Nuclide | Units | Reported Value (a) | Known Value (b) | Acceptance Range | Evaluation (c) |
|---|---|---|---|---|---|---|---|---|
| March 2010 | 10-MaW22 | Water | Am-241 | Bq/L | 1.25 | 1.30 | 0.091 - 1.69 | A |
| | | | Cs-134 | Bq/L | -0.0942 | | (1) | A |
| | | | Cs-137 | Bq/L | 58.5 | 60.6 | 42.4 - 78.8 | A |
| | | | Co-57 | Bq/L | 27.2 | 28.3 | 19.8 - 36.8 | A |
| | | | Co-60 | Bq/L | 0.0226 | | (1) | A |
| | | | H-3 | Bq/L | 104 | 90.8 | 63.6 - 118.0 | A |
| | | | Mn-54 | Bq/L | 26.6 | 26.9 | 18.8 - 35.0 | A |
| | | | Ni-63 | Bq/L | 61.3 | 59.9 | 41.9 - 77.9 | A |
| | | | Pu-238 | Bq/L | 1.94 | 1.93 | 1.35 - 2.51 | A |
| | | | Pu-239/240 | Bq/L | 0.0660 | 0.009 | (2) | A |
| | | | Sr-90 | Bq/L | 0.1029 | | (1) | A |
| | | | Tc-99 | Bq/L | -0.3907 | | (1) | A |
| | | | U-234/233 | Bq/L | 1.21 | 1.22 | 0.85 - 1.59 | A |
| | | | U-238 | Bq/L | 1.27 | 1.25 | 0.88 - 1.63 | A |
| | | | Zn-65 | Bq/L | 42.0 | 40.7 | 28.5 - 52.9 | A |
| | 10-GrW22 | Water | Gr-A | Bq/L | 0.5173 | 0.676 | 1.352 | A |
| | | | Gr-B | Bq/L | 3.98 | 3.09 | 1.55 - 4.64 | A |
| | 10-MaS22 | Soil | Am-241 | Bq/kg | 4.90 | | (1) | A |
| | | | Cs-134 | Bq/kg | 665 | 733 | 513 - 953 | A |
| | | | Cs-137 | Bq/kg | 800 | 779 | 545 - 1013 | A |
| | | | Co-57 | Bq/kg | 508 | 522 | 365 - 679 | A |
| | | | Co-60 | Bq/kg | 648 | 622 | 435 - 809 | A |
| | | | Mn-54 | Bq/kg | 893 | 849 | 594 - 1104 | A |
| | | | Ni-63 | Bq/kg | 514 | 477 | 334 - 620 | A |
| | | | Pu-238 | Bq/kg | 28.4 | 24.1 | 16.9 - 31.3 | A |
| | | | Pu-239/240 | Bq/kg | 0.2806 | | (1) | A |
| | | | K-40 | Bq/kg | 597 | 559 | 391 - 727 | A |
| | | | Sr-90 | Bq/kg | 221 | 288 | 202 - 374 | W |
| | | | Tc-99 | Bq/kg | -3.45 | | (1) | A |
| | | | U-234/233 | Bq/kg | 68.0 | 60 | 42 - 78 | A |
| | | | U-238 | Bq/kg | 69.2 | 64 | 45 - 83 | A |
| | | | Zn-65 | Bq/kg | -4.97 | | (1) | A |
| | 10-RdF22 | AP | Cs-134 | Bq/sample | 1.81 | 2.13 | 1.49 - 2.77 | A |
| | | | Cs-137 | Bq/sample | 1.70 | 1.53 | 1.07 - 1.99 | A |
| | | | Co-57 | Bq/sample | 0.0056 | | (1) | A |
| | | | Co-60 | Bq/sample | 2.65 | 2.473 | 1.731 - 3.215 | A |
| | | | Mn-54 | Bq/sample | 3.70 | 3.02 | 2.11 - 3.93 | W |

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



| Month/Year | Identification Number | Media | Nuclide | Units | Reported Value (a) | Known Value (b) | Acceptance Range | Evaluation (c) |
|---|---|---|---|---|---|---|---|---|
| | 10-RdF22 | AP | Pu-238 | Bq/sample | 0.0081 | 0.0010 | (2) | A |
| | | | Pu-239/240 | Bq/sample | 0.0757 | 0.0832 | 0.0582 - 0.1082 | A |
| | | | Sr-90 | Bq/sample | 0.0523 | | (1) | A |
| | | | U-234/233 | Bq/sample | 0.0732 | 0.068 | 0.048 - 0.088 | A |
| | | | U-238 | Bq/sample | 0.0791 | 0.071 | 0.050 - 0.092 | A |
| | | | Zn-65 | Bq/sample | -0.0627 | | (1) | A |
| | 10-GrF22 | AP | Gr-A | Bq/sample | 0.1533 | 0.0427 | 0.854 | A |
| | | | Gr-B | Bq/sample | 1.240 | 1.29 | 0.65 - 1.94 | A |
| March 2010 | 10-RdV22 | Vegetation | Cs-134 | Bq/sample | 4.48 | 4.39 | 3.07 - 5.71 | A |
| | | | Cs-137 | Bq/sample | 3.43 | 3.06 | 2.14 - 3.98 | A |
| | | | Co-57 | Bq/sample | -0.0117 | | (1) | A |
| | | | Co-60 | Bq/sample | 3.55 | 3.27 | 2.29 - 4.25 | A |
| | | | Mn-54 | Bq/sample | 0.007 | | (1) | A |
| | | | Sr-90 | Bq/sample | -0.0002 | | (1) | A |
| | | | Zn-65 | Bq/sample | 8.12 | 7.10 | 4.97 - 9.23 | A |
| September 2010 | 10-MaW23 | Water | Am-241 | Bq/L | 0.009 | | (1) | A |
| | | | Cs-134 | Bq/L | 27.1 | 31.4 | 22.0 - 40.8 | A |
| | | | Cs-137 | Bq/L | 41.8 | 44.2 | 30.9 - 57.5 | A |
| | | | Co-57 | Bq/L | 33.2 | 36.0 | 25.2 - 46.8 | A |
| | | | Co-60 | Bq/L | 26.5 | 28.3 | 19.8 - 36.8 | A |
| | | | H-3 | Bq/L | 500 | 453.4 | 317.4 - 589.4 | A |
| | | | Mn-54 | Bq/L | 0.024 | | (1) | A |
| | | | Ni-63 | Bq/L | 51.6 | 56.1 | 39.3 - 72.9 | A |
| | | | Pu-238 | Bq/L | 1.25 | 1.81 | 1.27 - 2.35 | N (3) |
| | | | Pu-239/240 | Bq/L | 0.925 | 1.350 | 0.95 - 1.76 | N (3) |
| | | | Sr-90 | Bq/L | 8.10 | 8.3 | 5.8 - 10.8 | A |
| | | | Tc-99 | Bq/L | 36.4 | 33.6 | 23.5 - 43.7 | A |
| | | | U-234/233 | Bq/L | 2.02 | 2.01 | 1.41 - 2.61 | A |
| | | | U-238 | Bq/L | 2.01 | 2.07 | 1.45 - 2.69 | A |
| | | | Zn-65 | Bq/L | 30.8 | 31.0 | 21.7 - 40.3 | A |
| | 10-GrW23 | Water | Gr-A | Bq/L | 2.36 | 1.92 | 0.58 - 3.26 | A |
| | | | Gr-B | Bq/L | 6.37 | 4.39 | 2.20 - 6.59 | A |
| | 10-MaS23 | Soil | Am-241 | Bq/kg | NR | | | |
| | | | Cs-134 | Bq/kg | 837 | 940 | 658 - 1222 | A |
| | | | Cs-137 | Bq/kg | 680 | 670 | 469 - 871 | A |

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



| Month/Year | Identification Number | Media | Nuclide | Units | Reported Value (a) | Known Value (b) | Acceptance Range | Evaluation (c) |
|---|---|---|---|---|---|---|---|---|
| | 10-MaS23 | Soil | Co-57 | Bq/kg | 2.78 | | (1) | A |
| | | | Co-60 | Bq/kg | 350 | 343 | 240 - 446 | A |
| | | | Mn-54 | Bq/kg | 853 | 820 | 574 - 1066 | A |
| | | | Ni-63 | Bq/kg | 938 | 1058 | 741 - 1375 | A |
| | | | Pu-238 | Bq/kg | NR | | | |
| | | | Pu-239/240 | Bq/kg | NR | | | |
| | | | K-40 | Bq/kg | 721 | 699 | 489 - 909 | A |
| | | | Sr-90 | Bq/kg | 2.24 | | (1) | A |
| | | | Tc-99 | Bq/kg | 297 | 325 | 228 - 423 | A |
| | | | U-234/233 | Bq/kg | NR | | | |
| | | | U-238 | Bq/kg | NR | | | |
| | | | Zn-65 | Bq/kg | 287 | 265 | 186 - 345 | A |
| | 10-RdF23 | AP | Am-241 | Bq/sample | 0.125 | 0.115 | 0.081 - 0.150 | A |
| | | | Cs-134 | Bq/sample | 2.31 | 2.98 | 2.09 - 3.87 | W |
| | | | Cs-137 | Bq/sample | -0.025 | | (1) | A |
| | | | Co-57 | Bq/sample | 0.0056 | 3.64 | 4.08 | A |
| | | | Co-60 | Bq/sample | 2.81 | 2.92 | 2.04 - 3.80 | A |
| | | | Mn-54 | Bq/sample | 3.19 | 3.18 | 2.23- 4.13 | A |
| | | | Pu-238 | Bq/sample | 0.048 | 0.0489 | 0.0342 - 0.0636 | A |
| | | | Pu-239/240 | Bq/sample | 0.080 | 0.082 | 0.057 - 0.107 | A |
| September 2010 | 10-RdF23 | AP | Sr-90 | Bq/sample | 1.01 | 1.01 | 0.71 - 1.31 | A |
| | | | U-234/233 | Bq/sample | 0.123 | 0.122 | 0.085 - 0.159 | A |
| | | | U-238 | Bq/sample | 0.111 | 0.127 | 0.089 - 0.165 | A |
| | | | Zn-65 | Bq/sample | 0.0310 | | (1) | A |
| | 10-GrF23 | AP | Gr-A | Bq/sample | 0.004 | | (1) | A |
| | | | Gr-B | Bq/sample | 0.473 | 0.50 | 0.25 - 0.75 | A |
| | 10-RdV23 | Vegetation | Cs-134 | Bq/sample | 4.90 | 4.79 | 3.35 - 6.23 | A |
| | | | Cs-137 | Bq/sample | 6.78 | 5.88 | 4.12 - 7.64 | A |
| | | | Co-57 | Bq/sample | 10.2 | 8.27 | 5.79 - 10.75 | W |
| | | | Co-60 | Bq/sample | 0.00 | | (1) | A |
| | | | Mn-54 | Bq/sample | 7.36 | 6.287 | 4.401 - 8.173 | A |
| | | | Sr-90 | Bq/sample | 2.53 | 2.63 | 1.84 - 3.42 | A |
| | | | Zn-65 | Bq/sample | 6.40 | 5.3900 | 3.77 - 7.01 | A |

See footnotes on next page.

*(1) False positive test.*

*(2) Sensitivity evaluation*

*(3) NCR 11-01 initiated to investigate failure.*

*(a) Teledyne Brown Engineering reported result.*

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

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

## ERA ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM
## TELEDYNE BROWN ENGINEERING ENVIRONMENTAL SERVICES

**(PAGE 1 OF 1)**

| Month/Year | Identification Number | Media | Nuclide | Units | Reported Value (a) | Known Value (b) | Control Limits | Evaluation (c) |
|---|---|---|---|---|---|---|---|---|
| May 2010 | RAD-81 | Water | Sr-89 | pCi/L | 64.4 | 60.4 | 48.6 - 68.2 | A |
| | | | Sr-90 | pCi/L | 37.8 | 41.3 | 30.4 - 47.4 | A |
| | | | Ba-133 | pCi/L | 66.4 | 65.9 | 54.9 - 72.5 | A |
| | | | Cs-134 | pCi/L | 66.43 | 71.6 | 58.4 - 78.8 | A |
| | | | Cs-137 | pCi/L | 137.33 | 146 | 131 - 163 | A |
| | | | Co-60 | pCi/L | 83.33 | 84.5 | 76.0 - 95.3 | A |
| | | | Zn-65 | pCi/L | 177 | 186 | 167 - 219 | A |
| | | | Gr-A | pCi/L | 26.37 | 32.9 | 16.9 - 42.6 | A |
| | | | Gr-B | pCi/L | 28.77 | 37.5 | 24.7 - 45.0 | A |
| | | | I-131 | pCi/L | 26.27 | 26.4 | 21.9 - 31.1 | A |
| | | | U-Nat | pCi/L | 57.19 | 62.3 | 50.7 - 69.1 | A |
| | | | H-3 | pCi/L | 12967 | 12400 | 10800 - 13600 | A |
| | MRAD-12 | Filter | Gr-A | pCi/filter | 88.1 | 79.6 | 41.3 - 130 | A |
| November 2010 | RAD-83 | Water | Sr-89 | pCi/L | 77.8 | 68.5 | 55.8 - 76.7 | N (1) |
| | | | Sr-90 | pCi/L | 39.3 | 43.0 | 31.7 - 49.3 | A |
| | | | Ba-133 | pCi/L | 70.3 | 68.9 | 57.5 - 75.8 | A |
| | | | Cs-134 | pCi/L | 39.9 | 43.2 | 34.5 - 47.5 | A |
| | | | Cs-137 | pCi/L | 117 | 123 | 111 - 138 | A |
| | | | Co-60 | pCi/L | 53.5 | 53.4 | 48.1 - 61.3 | A |
| | | | Zn-65 | pCi/L | 11.0 | 102 | 91.8 - 122 | N (1) |
| | | | Gr-A | pCi/L | 35.1 | 42.3 | 21.9 - 53.7 | A |
| | | | Gr-B | pCi/L | 35.5 | 36.6 | 24.0 - 44.2 | A |
| | | | I-131 | pCi/L | 27.9 | 27.5 | 22.9 - 32.3 | A |
| | | | U-Nat | pCi/L | 36.8 | 36.8 | 29.8 - 41.0 | A |
| | | | H-3 | pCi/L | 13233 | 12900 | 11200 - 14200 | A |
| | MRAD-13 | Filter | Gr-A | pCi/filter | 40.1 | 52.3 | 27.1 - 78.7 | A |

See footnotes on next page.

*(1) Sr-89 TBE to known ratio of 1.14 fell within acceptable range of ± 20%. No action required. NCR 10-09*

*(1) Zn-65 result of 111 was incorrectly reported as 11.0. No action required. NCR 10-09*

*(a) Teledyne Brown Engineering reported result.*

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

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