VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

April 29, 2011

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

Serial No. 11-218
SS&L/JSA R0
Docket Nos. 50-280
50-281
72-2
72-55
License Nos. DPR-32
DPR-37
SNM-2501

Gentlemen:

VIRGINIA ELECTRIC AND POWER COMPANY
SURRY POWER STATION UNITS 1 AND 2
INDEPENDENT SPENT FUEL STORAGE INSTALLATION
ANNUAL RADIOLOGICAL ENVIRONMENTAL OPERATING REPORT

Surry Units 1 and 2 Technical Specification 6.6.B.2 requires the submittal of an Annual Radiological Environmental Operating Report (AREOR) for Surry Power Station. Surry Independent Spent Fuel Storage Installation (ISFSI) Technical Specification Appendix C, Item 1.3.1 requires that the Surry ISFSI be included in the environmental monitoring for Surry Power Station. Accordingly, enclosed is the Surry Power Station AREOR for the period of January 1, 2010 through December 31, 2010, which includes environmental monitoring for the Surry ISFSI.

If you have any further questions, please contact Paul Harris at 757-365-2692.

Sincerely,

B. L. Stanley
Director Safety & Licensing
Surry Power Station

Attachment

Commitments made in this letter: None

IE25
NRR
NMSS

cc: U. S. Nuclear Regulatory Commission
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Washington, D. C. 20555-0001

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109 Governor Street, Room 730
Richmond, Virginia 23219

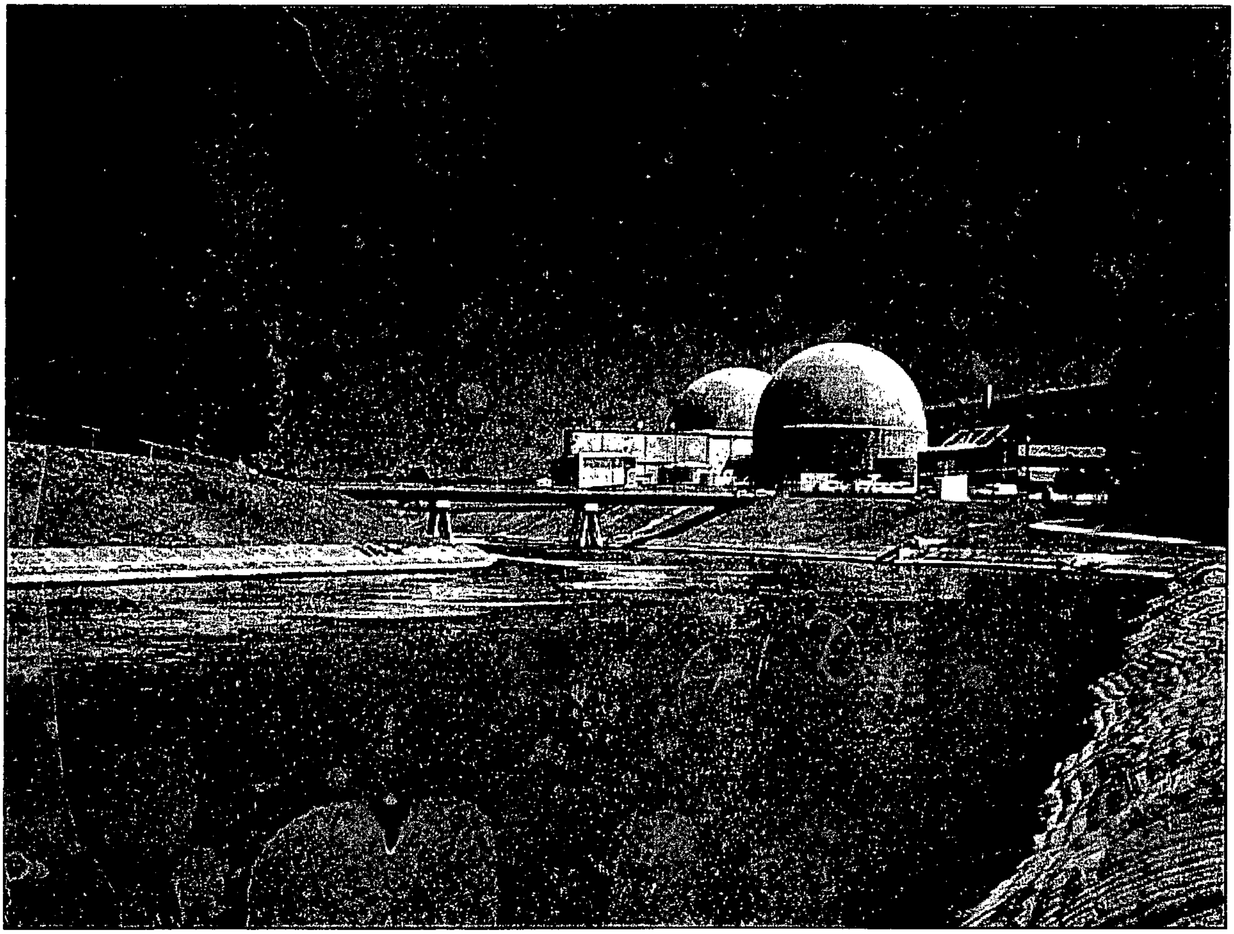
Serial No. 11-218
Docket Nos.: 50-280
50-281
72-2
72-55

ATTACHMENT 1

2010 Annual Radiological Environmental Operating Report

SURRY POWER STATION UNITS 1 AND 2
VIRGINIA ELECTRIC AND POWER COMPANY

Surry Power Station



2010 Annual Radiological Environmental Operating Report

Dominion®

Annual Radiological Environmental Operating Report

Surry Power Station

January 1, 2010 to December 31, 2010

Prepared by: ______________________
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Dominion

Surry Power Station

Radiological Environmental Monitoring Program

January 1, 2010 to December 31, 2010

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PREFACE

This report is submitted as required by Technical Specification 6.6.B.2, Annual Radiological Environmental Operating Report, for Surry, Units 1 and 2, Virginia Electric and Power Company Docket Nos. 50-280 and 50-281.

1. EXECUTIVE SUMMARY

This document is a detailed report of the 2010 Surry Power Station Radiological Environmental Monitoring Program (REMP). Radioactivity levels from January 1 through December 31, 2010, in air, water, silt, shoreline sediment, milk, aquatic biota, food products 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 are monitored within a 20-mile radius of the station. Surry 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. The first type, control samples, is collected from areas that are beyond the measurable influence of Surry 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 Surry 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 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.

Teledyne Brown Engineering, Inc. provides radioanalyses for this program and Global Dosimetry Solutions, Inc. provides thermoluminescent dosimetry (TLD) 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 United States Nuclear Regulatory Commission (USNRC) 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 USNRC also mandates a reporting level for 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, aquatic, terrestrial and direct radiation exposure. The airborne exposure pathway includes radioactive airborne iodine and particulates. The 2010 airborne results were similar to previous years. No station related radioactivity was detected and natural radioactivity levels remained at levels consistent with past years' results. Aquatic exposure pathway samples include well and river water, silt and shoreline sediments, crabs, fish, clams and oysters. Naturally occurring potassium-40 was detected at average environmental levels. No man-made radionuclides were detected in well water. This trend is consistent throughout the operational environmental monitoring program. Tritium was detected in one of eight river water samples at 5.9% of the USNRC reporting level, that sample being from the discharge canal. No other man-made radionuclides were detected in river water. Silt samples indicated the presence of cesium-137 and naturally occurring radionuclides. The cesium-137 activity was present in the control and indicator locations and is attributable to global fallout from past nuclear weapons testing and nuclear accidents such as Chernobyl. Shoreline sediment, which may provide a direct exposure pathway, contained no station related radionuclides. Naturally occurring potassium-40 and thorium-228 were detected at average environmental levels. The terrestrial exposure pathway includes milk and food 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. Strontium-90 was again detected in milk and this activity is attributable to past atmospheric nuclear weapons testing. No man-made radionuclides were detected in food product samples. Consistent with historical data, naturally occurring potassium-40 was detected in milk and food products. The direct exposure pathway measures environmental radiation doses using TLDs. TLD results have remained relatively constant over the years.

During 2010, as in previous years, the operation of Surry Power Station has 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 0.182 millirem. For reference, this dose may be compared to the 620 millirem average annual exposure to every person in the United States from natural and man-made sources. Natural sources in the environment provide approximately 50% of radiation exposure to man, while nuclear power contributes less than 0.1%. These results demonstrate compliance with federal and state regulations and also demonstrate the adequacy of radioactive effluent controls at Surry Power Station.

2. PROGRAM DESCRIPTION

2.1 Introduction

This report documents the 2010 Surry Power Station operational Radiological Environmental Monitoring Program (REMP). The Dominion Surry Power Station is located on the Gravel Neck peninsula adjacent to the James River, approximately 25 miles upstream of the Chesapeake Bay. 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 is designed with a nominal gross electrical output of 910 megawatts electric (MWe). Unit 1 achieved commercial operation on December 22, 1972, and Unit 2 on May 1, 1973.

The United States Nuclear Regulatory Commission regulations (10CFR50.34a) 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. To ensure these criteria are met, the operating license for Surry Power Station includes Technical Specifications that address the release of radioactive effluents. In-plant monitoring is used to ensure that these 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 station environs is also included in Surry Power Station Technical Specifications.

Dominion personnel are responsible for collecting the various indicator and control environmental samples. Global Dosimetry Solutions Incorporated is responsible for processing the TLDs. Teledyne Brown Engineering 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 values, which vary with time due to external events, such as cosmic ray bombardment, nuclear weapons test fallout and seasonal variations of naturally occurring radionuclides. 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.

Occasionally, samples of environmental media may show the presence of man-made radionuclides. 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, "Environmental Technical Specifications for Nuclear Power Plants", (December, 1975) and VPAP-2103S, Offsite Dose Calculation Manual (Surry).

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 REMP 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 Surry Power Station. All samples listed in Table 2-1 are taken at indicator locations except those labeled "control." Dominion personnel collect all samples listed in Table 2-1.

Table 2-2 summarizes the analysis program conducted by Teledyne Brown Engineering and Global Dosimetry Solutions for Surry Power Station. All samples, with the exception of the TLDs, are shipped to Teledyne Brown Engineering, located in Knoxville, TN, for analysis. The TLDs are shipped to Global Dosimetry Solutions, located in Costa Mesa, CA, for processing.

The Surry Radiological Monitoring Locations maps (Figures 1 – 5) denote sample locations for Surry Power Station. The locations are color coded to designate sample types.

Table 2-1

SURRY - 2010
RADIOLOGICAL SAMPLING STATIONS
DISTANCE AND DIRECTION FROM UNIT NO. 1

Sample Media	Location	Station	Distance Miles	Direction	Degrees	Collection Frequency	Remarks
Environmental TLDs	Control	(00)	-	-	-	Quarterly	Onsite (Stored in a lead shield outside the protected area)
	West North West	(02)	0.2	WNW	293°	Quarterly	Site Boundary
	Surry Station Discharge	(03)	0.4	NW	321°	Quarterly	Site Boundary
	North North West	(04)	0.2	NNW	329°	Quarterly	Site Boundary
	North	(05)	0.3	N	4°	Quarterly	Site Boundary
	North North East	(06)	0.3	NNE	28°	Quarterly	Site Boundary
	North East	(07)	0.3	NE	44°	Quarterly	Site Boundary
	East North East	(08)	0.4	ENE	67°	Quarterly	Site Boundary
	East	(09)	0.3	E	89°	Quarterly	Site Boundary
	West	(10)	0.1	W	271°	Quarterly	Site Boundary
	West South West	(11)	0.4	WSW	252°	Quarterly	Site Boundary
	South West	(12)	0.3	SW	228°	Quarterly	Site Boundary
	South South West	(13)	0.3	SSW	201°	Quarterly	Site Boundary
	South	(14)	0.4	S	182°	Quarterly	Site Boundary
	South South East	(15)	0.6	SSE	157°	Quarterly	Site Boundary
	South East	(16)	0.9	SE	135°	Quarterly	Site Boundary
	Station Intake	(18)	1.6	ESE	115°	Quarterly	Site Boundary
	Hog Island Reserve	(19)	2.0	NNE	26°	Quarterly	Near Resident
	Bacon's Castle	(20)	4.5	SSW	202°	Quarterly	Apx. 5 mile
	Route 633	(21)	4.9	SW	227°	Quarterly	Apx. 5 mile
	Alliance	(22)	5.1	WSW	247°	Quarterly	Apx. 5 mile
	Surry	(23)	7.7	WSW	256°	Quarterly	Population Center
	Route 636 and 637	(24)	4.0	W	270°	Quarterly	Apx. 5 mile
	Scotland Wharf	(25)	5.0	WNW	284°	Quarterly	Apx. 5 mile
	Jamestown	(26)	6.3	NW	308°	Quarterly	Apx. 5 mile
	Colonial Parkway	(27)	3.8	NNW	333°	Quarterly	Apx. 5 mile
	Route 617 and 618	(28)	4.9	NNW	340°	Quarterly	Apx. 5 mile
	Kingsmill	(29)	4.6	N	2°	Quarterly	Apx. 5 mile
	Williamsburg	(30)	7.8	N	0°	Quarterly	Population Center
	Kingsmill North	(31)	5.5	NNE	12°	Quarterly	Apx. 5 mile
	Budweiser	(32)	5.8	NNE	27°	Quarterly	Population Center
	Water Plant	(33)	5.0	NE	46°	Quarterly	Apx. 5 mile

Table 2-1
SURRY - 2010
RADIOLOGICAL SAMPLING STATIONS
DISTANCE AND DIRECTION FROM UNIT NO. 1

Sample Media	Location	Station	Distance Miles	Direction	Degrees	Collection Frequency	Remarks
Environmental TLDs	BASF	(34)	5.1	ENE	70°	Quarterly	Apx. 5 mile
	Lee Hall	(35)	7.1	ENE	75°	Quarterly	Population Center
	Goose Island	(36)	5.1	E	90°	Quarterly	Apx. 5 mile
	Fort Eustis	(37)	4.9	ESE	104°	Quarterly	Apx. 5 mile
	Newport News	(38)	19.3	SE	130°	Quarterly	Population Center
	James River Bridge	(39)	17.1	SE	142°	Quarterly	Control Location
	Benn's Church	(40)	17.0	SSE	159°	Quarterly	Control Location
	Smithfield	(41)	13.4	SSE	167°	Quarterly	Control Location
	Rushmere	(42)	5.3	SSE	156°	Quarterly	Apx. 5 mile
	Route 628	(43)	5.1	S	177°	Quarterly	Apx. 5 mile
Air Charcoal and Particulate	Surry Station	(SS)	0.3	NNE	18°	Weekly	Site boundary location with highest D/Q
	Hog Island Reserve	(HIR)	2.0	NNE	26°	Weekly	
	Bacon's Castle	(BC)	4.5	SSW	202°	Weekly	
	Alliance	(ALL)	5.1	WSW	247°	Weekly	
	Colonial Parkway	(CP)	3.8	NNW	333°	Weekly	
	BASF	(BASF)	5.1	ENE	70°	Weekly	
	Fort Eustis	(FE)	4.9	ESE	104°	Weekly	
	Newport News	(NN)	19.3	SE	130°	Weekly	Control Location
River Water	Surry Station Discharge	(SD)	0.4	NW	323°	Monthly	
	Scotland Wharf	(SW)	4.9	WNW	284°	Monthly	Control Location
Well Water	Surry Station	(SS)	0.1	SW	227°	Quarterly	Onsite
	Hog Island Reserve	(HIR)	2.0	NNE	28°	Quarterly	
	Construction Site	(CS)	0.3	E	87°	Quarterly	
Shoreline Sediment	Hog Island Reserve	(HIR)	0.6	N	7°	Semi-Annually	
	Chickahominy River	(CHIC)	11.2	WNW	301°	Semi-Annually	Control Location
Silt	Chickahominy River	(CHIC)	11.2	WNW	300°	Semi-Annually	Control Location
	Surry Station Discharge	(SD)	1.3	NNW	341°	Semi-Annually	

Table 2-1
SURRY - 2010
RADIOLOGICAL SAMPLING STATIONS
DISTANCE AND DIRECTION FROM UNIT NO. 1

Sample Media	Location	Station	Distance Miles	Direction	Degrees	Collection Frequency	Remarks
Milk	Colonial Parkway	(CP)	3.7	NNW	336°	Monthly	
	Williams	(WMS)	27.5	S	175°	Monthly	Control Location
	Epps	(EPPS)	4.8	SSW	200°	Monthly	
Oysters	Point of Shoals	(POS)	6.4	SSE	157°	Semi-Annually	
	Mulberry Point	(MP)	4.9	ESE	124°	Semi-Annually	
Clams	Chickahominy River	(CHIC)	11.2	WNW	300°	Semi-Annually	Control Location
	Surry Station Discharge	(SD)	1.3	NNW	341°	Semi-Annually	
	Hog Island Point	(HIP)	2.4	NE	52°	Semi-Annually	
	Lawne's Creek	(LC)	2.4	SE	131°	Semi-Annually	
	Jamestown Island	(JI)	3.9	NNW	324°	Semi-Annually	
Fish	Surry Station Discharge	(SD)	1.3	NNW	341°	Semi-Annually	
Crabs	Surry Station Discharge	(SD)	1.3	NNW	341°	Annually	
Crops	Brock's Farm	(BROCK)	3.8	S	183°	Annually	
(Corn, Peanuts, Soybeans)	Slade's Farm	(SLADE)	3.2	S	179°	Annually	

Table 2-2

SURRY - 2010

SAMPLE ANALYSIS PROGRAM

SAMPLE MEDIA	FREQUENCY	ANALYSIS	LLD*	REPORT UNITS
Thermoluminescent Dosimetry (TLD)	Quarterly	Gamma Dose	2	mR/Std. Month
Air Iodine	Weekly	I-131	0.07	pCi/m^3
Air Particulate	Weekly	Gross Beta	0.01	pCi/m^3
	Quarterly (a)	Gamma Isotopic		pCi/m^3
		Cs-134	0.05	
		Cs-137	0.06	
River Water	Quarterly Composite of monthly sample	Tritium (H-3)	2000	pCi/L
	Monthly	I-131	10	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	
Well Water	Quarterly	Tritium (H-3)	2000	pCi/L
		I-131	1	
		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	

Footnotes located at end of table.

Table 2-2
SURRY - 2010
SAMPLE ANALYSIS PROGRAM

SAMPLE MEDIA	FREQUENCY	ANALYSIS	LLD*	REPORT UNITS
Shoreline Sediment	Semi-Annually	Gamma Isotopic		pCi/kg - dry
		Cs-134	150	
		Cs-137	180	
Silt	Semi-Annually	Gamma Isotopic		pCi/kg - dry
		Cs-134	150	
		Cs-137	180	
Milk	Monthly	I-131	1	pCi/L
		Gamma Isotopic		pCi/L
		Cs-134	15	
		Cs-137	18	
		Ba-140	60	
		La-140	15	
	Quarterly	Sr-89	NA	pCi/L
	Composite of CP monthly sample	Sr-90	NA	
Oysters	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	
Clams	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	
Crabs	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	

Footnotes located at end of table.

Table 2-2

SURRY - 2010

SAMPLE ANALYSIS PROGRAM

SAMPLE MEDIA	FREQUENCY	ANALYSIS	LLD*	REPORT UNITS
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	Annually	Gamma Isotopic		pCi/kg - wet
		I-131	60	
		Cs-134	60	
		Cs-137	80	

Note: This table is not a complete listing of nuclides that can be detected and reported. Other peaks that ar are measurable and identifiable, together with the above nuclides, are also identified and reported.

* LLD is the Lower Limit of Detection as defined and required in the USNRC Branch Technical Position on an Acceptable Radiological Environmental Monitoring Program, Revision 1, November 1979. LLDs indicate those concentrations to which environmental samples are required to be analyzed. Actual analysis of samples may be lower than these listed values.

(a) Quarterly composites of each location's weekly air particulate samples are analyzed for gamma emitters.

NA None assigned

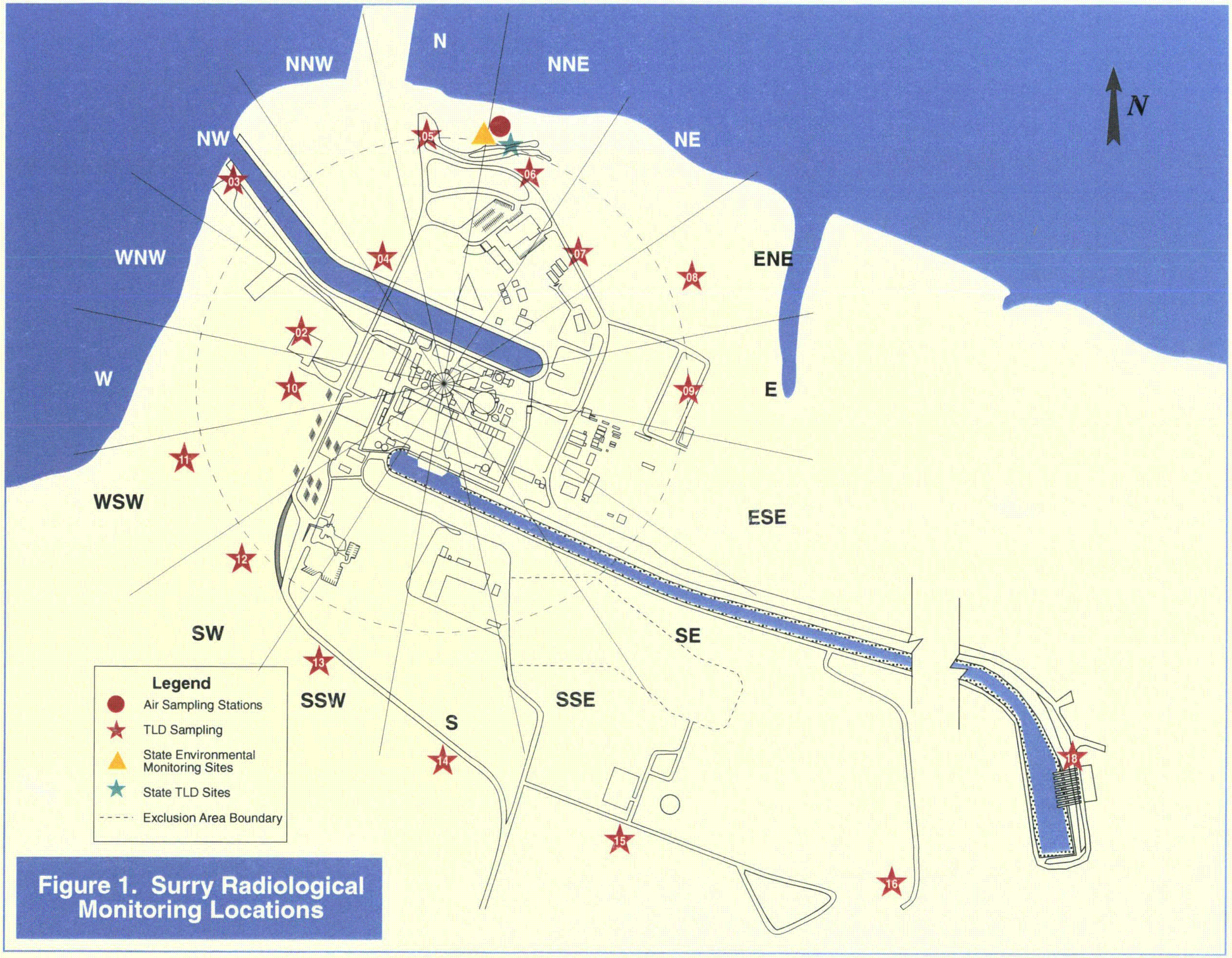

Figure 1. Surry Radiological Monitoring Locations

Graphics No. SV645F

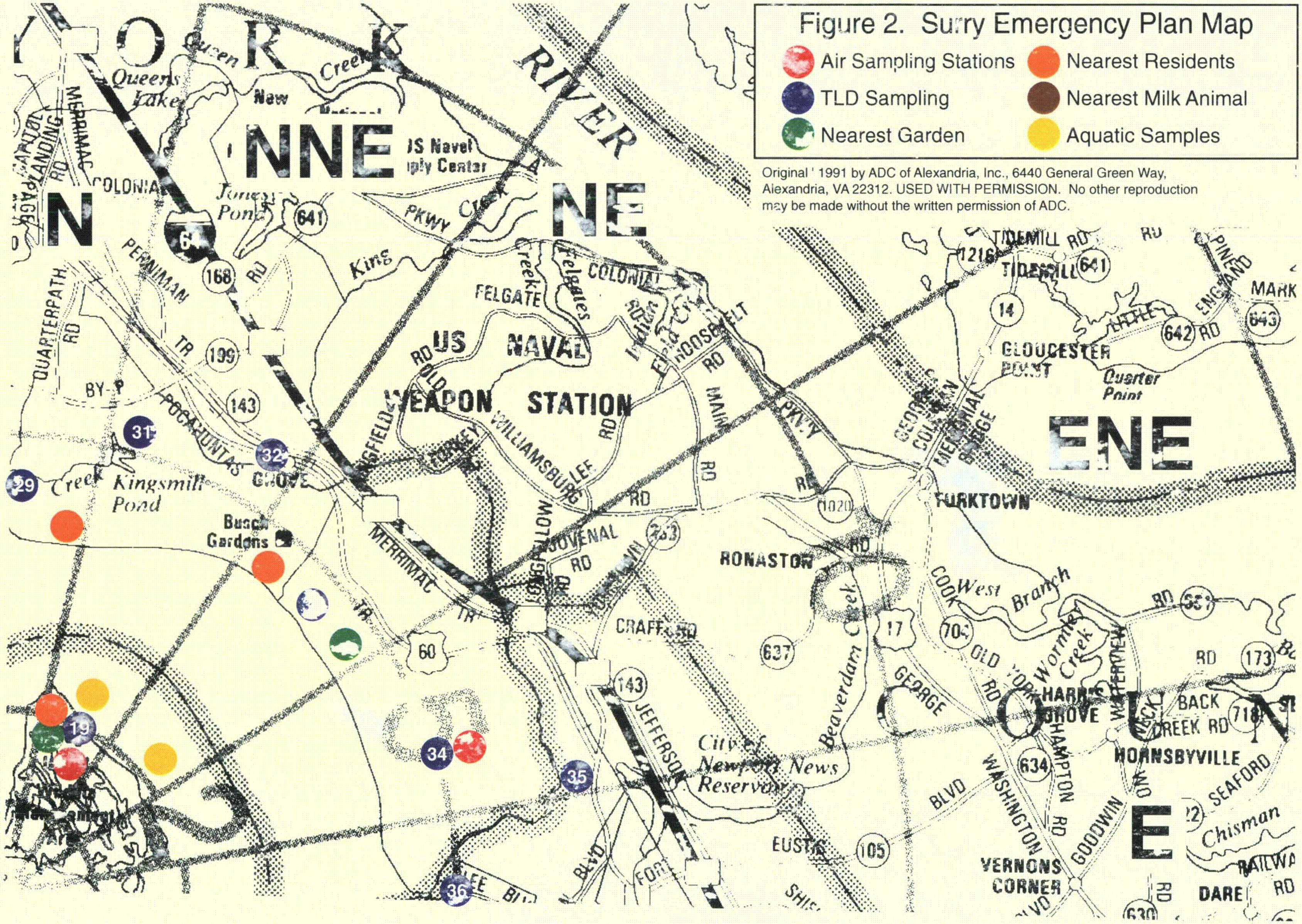

Figure 2. Surry Emergency Plan Map

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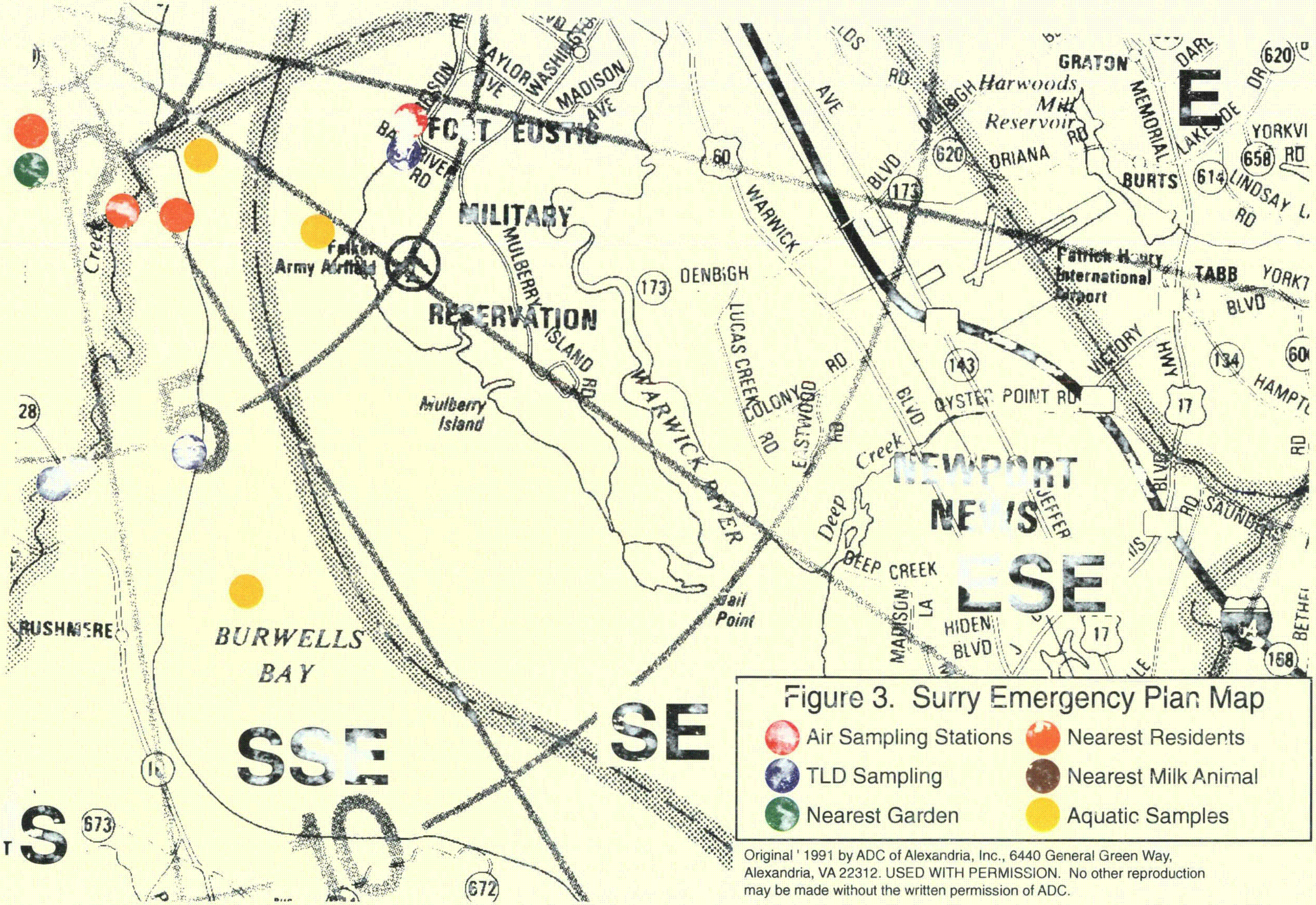

Figure 3. Surry Emergency Plan Map

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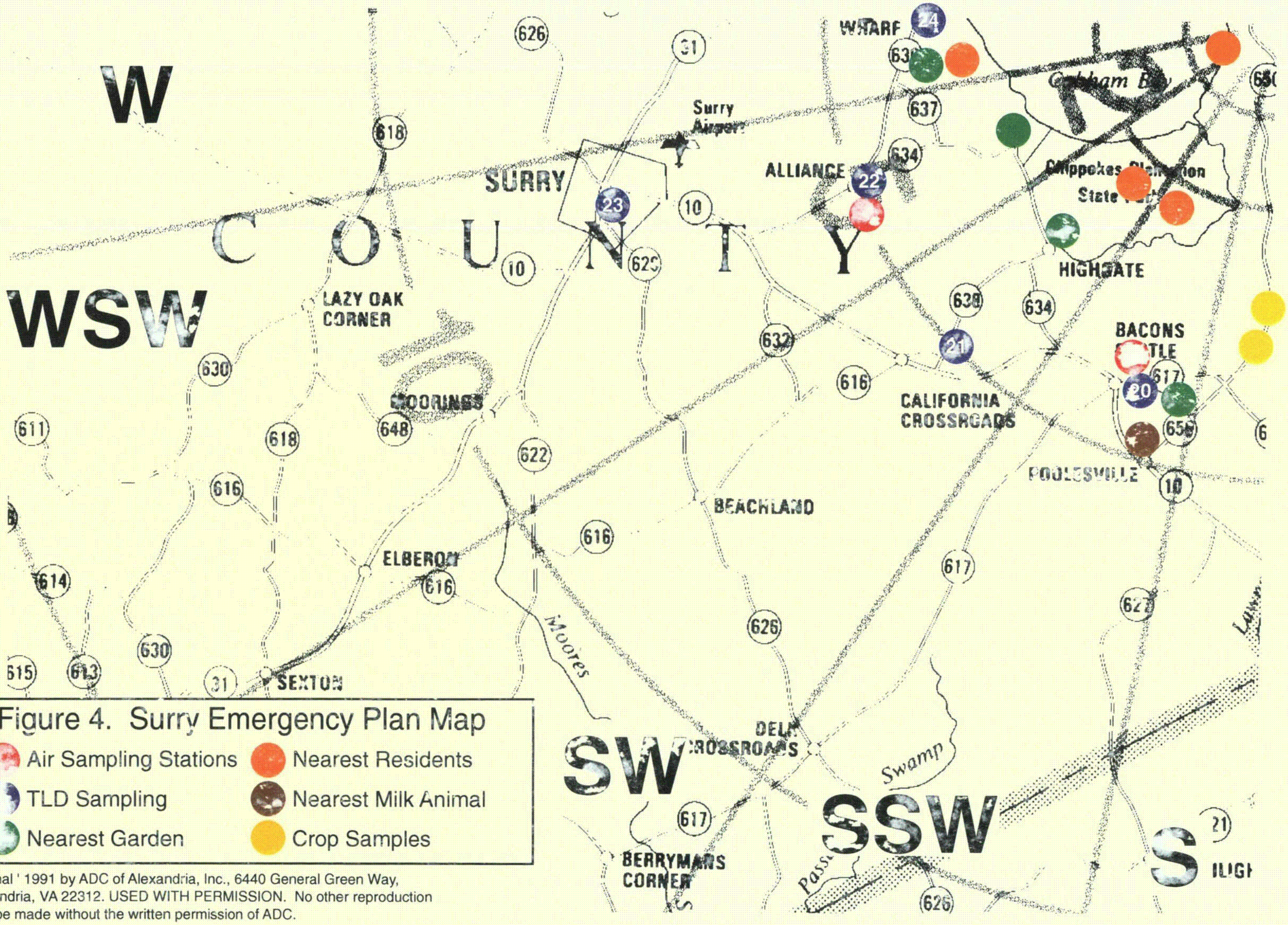

Figure 4. Surry Emergency Plan Map

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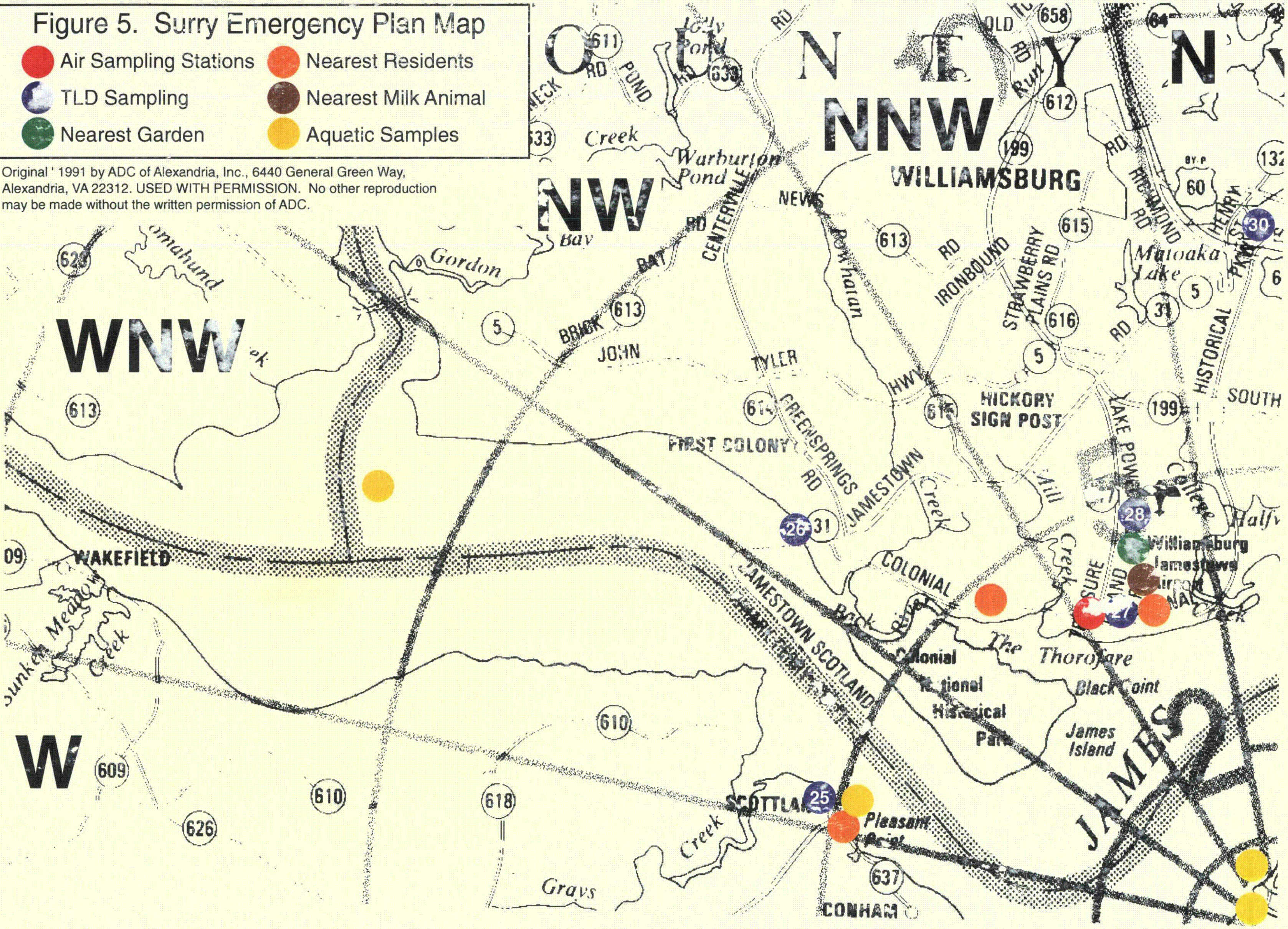

Figure 5. Surry Emergency Plan Map

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Graphics No. CB3307B

3. ANALYTICAL RESULTS

3.1 Summary of Results

In accordance with the Surry 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", Revision 1, November 1979. A more detailed analysis of the data is given in Section 4.

TABLE 3-1: RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

Surry Power Station, Surry County, Virginia - 2010

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Medium or Pathway Sampled (Units)	Analysis Type	Total No.	LLD	Indicator Locations Mean Range	Location with Highest Mean Name	Distance Direction	Mean Range	Control Locations Mean Range	Non-Routine Reported Measurements
Direct Radiation *TLD (mR/ Std Month)*	**Gamma**	164	2	**3.3 (152/152) (1.1 - 6.0)**	**STA-41**	**13.4 mi SSE**	**5.5 (4/4) (4.5 - 6.7)**	**3.6 (12/12) (1.3 - 6.7)**	0
Air Particulate *(1E-3 pCi/m3)*	**Gross Beta**	416	10	**14.9 (359/364) (3.8 - 36.1)**	**ALL**	**5.1 mi WSW**	**17.1 (52/52) (3.8 - 36.1)**	**17.0 (51/52) (6.3 - 33.7)**	0
	Gamma	32							
	Be-7	32		**149 (28/28) (54.1 - 226)**	**ALL**	**5.1 mi WSW**	**171 (4/4) (138 - 203)**	**151 (4/4) (133 - 173)**	0
	Cs-134	32	50	< LLD	N/A		< LLD	< LLD	0
	Cs-137	32	60	< LLD	N/A		< LLD	< LLD	0
Air Iodine *(1E-3 pCi/m3)*	**I-131**	416	70	< LLD	N/A		< LLD	< LLD	0
Milk *(pCi/Liter)*	**Strontium**	4							
	Sr-89	4		< LLD	N/A		< LLD	N/A	0
	Sr-90	4		**1.26 (1/4) (1.26 - 1.26)**	**CP**	**3.7 mi NNW**	**1.26 (1/4) (1.26 - 1.26)**	N/A	0
	Gamma	36							
	K-40	36		**1259 (24/24) (1127 - 1457)**	**CP**	**3.7 mi NNW**	**1304 (12/12) (1168 - 1457)**	**1270 (12/12) (1139 - 1370)**	0
	Th-228	36		**12.1 (3/24) (10.2 - 15.4)**	**EPPS**	**4.8 mi SSW**	**12.8 (2/24) (10.2 - 15.4)**	**11.6 (1/12) (11.6 - 11.6)**	0
	I-131	36	1	< LLD	N/A		< LLD	< LLD	0
	Cs-134	36	15	< LLD	N/A		< LLD	< LLD	0
	Cs-137	36	18	< LLD	N/A		< LLD	< LLD	0

TABLE 3-1: RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

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Medium or Pathway Sampled *(Units)*	Analysis Type	Analysis Total No.	LLD	Indicator Locations Mean Range	Location with Highest Mean Name	Location with Highest Mean Distance Direction	Location with Highest Mean Mean Range	Control Locations Mean Range	Non-Routine Reported Measurements
Milk *(pCi/Liter)*	**Gamma**	36							
	Ba-140	36	60	< LLD	N/A		< LLD	< LLD	0
	La-140	36	15	< LLD	N/A		< LLD	< LLD	0
Food Products *(pCi/kg wet)*	**Gamma**	3							
	K-40	3		**8797 (3/3)** **(2660 - 15400)**	**SLADE**	**3.2 mi** **S**	**15400 (1/1)** **(15400-15400)**	N/A	0
	Th-228	3		**22.3 (1/3)** **(22.3 - 22.3)**	**BROCK**	**3.8 mi** **S**	**10.4 (1/2)** **(10.4 - 10.4)**	N/A	
	I-131	3	60	< LLD	N/A		< LLD	N/A	0
	Cs-134	3	60	< LLD	N/A		< LLD	N/A	0
	Cs-137	3	80	< LLD	N/A		< LLD	N/A	0
Well Water *(pCi/Liter)*	**H-3**	12	2000	< LLD	N/A		< LLD	N/A	0
	Gamma	12							
	K-40	12		**37.5 (2/12)** **(61.2 - 109)**	**SS**	**0.1 mi** **SW**	**109 (1/4)** **(109 - 109)**	N/A	0
	Th-228	12		**11.8 (2/12)** **(7.42 - 16.2)**	**SS**	**0.1 mi** **SW**	**11.8 (2/4)** **(7.42 - 16.2)**	N/A	0
	Mn-54	12	15	< LLD	N/A		< LLD	N/A	0
	Co-58	12	15	< LLD	N/A		< LLD	N/A	0
	Fe-59	12	30	< LLD	N/A		< LLD	N/A	0
	Co-60	12	15	< LLD	N/A		< LLD	N/A	0

Medium or Pathway Sampled (Units)	Analysis Type	Analysis Total No.	LLD	Indicator Locations Mean Range	Location with Highest Mean Name	Location with Highest Mean Distance Direction	Location with Highest Mean Mean Range	Control Locations Mean Range	Non-Routine Reported Measurements
Well Water *(pCi/Liter)*	Zn-65	12	30	< LLD	N/A		< LLD	N/A	0
	Nb-95	12	15	< LLD	N/A		< LLD	N/A	0
	Zr-95	12	30	< LLD	N/A		< LLD	N/A	0
	I-131	12	1	< LLD	N/A		< LLD	N/A	0
	Cs-134	12	15	< LLD	N/A		< LLD	N/A	0
	Cs-137	12	18	< LLD	N/A		< LLD	N/A	0
	Ba-140	12	60	< LLD	N/A		< LLD	N/A	0
	La-140	12	15	< LLD	N/A		< LLD	N/A	0
River Water *(pCi/Liter)*	**H-3**	8	2000	**1760 (1/4) (1760 - 1760)**	**SD**	**0.4 mi NW**	**1760 (1/4) (1760 - 1760)**	< LLD	0
	Gamma	24							
	K-40	24		**102.1 (9/12) (54.8 - 151)**	**SW**	**4.9 mi WNW**	**105.6 (9/12) (35.7 - 246)**	**105.6 (9/12) (35.7 - 246)**	0
	Th-228	24		< LLD	**SW**	**4.9 mi WNW**	**8.0 (2/12) (5.67 - 10.3)**	**8.0 (2/12) (5.67 - 10.3)**	0
	Ra-226	24		< LLD	**SW**	**4.9 mi WNW**	**54.5 (1/12) (54.5 - 54.5)**	**54.5 (1/12) (54.5 - 54.5)**	0
	Mn-54	24	15	< LLD	N/A		< LLD	< LLD	0
	Co-58	24	15	< LLD	N/A		< LLD	< LLD	0
	Fe-59	24	30	< LLD	N/A		< LLD	< LLD	0

Medium or Pathway Sampled (Units)	Analysis Type	Analysis Total No.	LLD	Indicator Locations Mean Range	Location with Highest Mean Name	Location with Highest Mean Distance Direction	Location with Highest Mean Mean Range	Control Locations Mean Range	Non-Routine Reported Measurements
River Water *(pCi/Liter)*	Co-60	24	15	< LLD	N/A		< LLD	< LLD	0
	Zn-65	24	30	< LLD	N/A		< LLD	< LLD	0
	Nb-95	24	15	< LLD	N/A		< LLD	< LLD	0
	Zr-95	24	30	< LLD	N/A		< LLD	< LLD	0
	I-131	24	10	< LLD	N/A		< LLD	< LLD	0
	Cs-134	24	15	< LLD	N/A		< LLD	< LLD	0
	Cs-137	24	18	< LLD	N/A		< LLD	< LLD	0
	Ba-140	24	60	< LLD	N/A		< LLD	< LLD	0
	La-140	24	15	< LLD	N/A		< LLD	< LLD	0
Silt *(pCi/kg dry)*	**Gamma**	4							
	K-40	4		**13850 (2/2) (13600-14100)**	**CHIC**	**11.2 mi WNW**	**15350 (2/2) (14600-16100)**	**15350 (2/2) (14600-16100)**	0
	Cs-134	4	150	< LLD	N/A		< LLD	< LLD	0
	Cs-137	4	180	**181 (2/2) (175 - 187)**	**SD**	**1.3 mi NNW**	**181 (2/2) (175 - 187)**	**177 (2/2) (152 - 202)**	0
	Th-228	4		**1055 (2/2) (970 - 1140)**	**SD**	**1.3 mi NNW**	**1055 (2/2) (970 - 1140)**	**1038 (2/2) (965 - 1110)**	0
	Th-232	4		**1045 (2/2) (1000 - 1090)**	**SD**	**1.3 mi NNW**	**1045 (2/2) (1000 - 1090)**	**988 (2/2) (957 - 1020)**	0
	Ra-226	4		**1785 (2/2) (1430 - 2140)**	**CHIC**	**11.2 mi WNW**	**2895 (2/2) (2340 - 3450)**	**2895 (2/2) (2340 - 3450)**	0

TABLE 3-1: RADIOLOGICAL ENVIRONMENTAL MONITORING PROGRAM SUMMARY

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Medium or Pathway Sampled (Units)	Analysis Type	Analysis Total No.	LLD	Indicator Locations Mean Range	Location with Highest Mean Name	Distance Direction	Mean Range	Control Locations Mean Range	Non-Routine Reported Measurements
Silt *(pCi/kg dry)*	Ac-228	4		< LLD	**CHIC**	**11.2 mi WNW**	**434 (1/2) (434 - 434)**	**434 (1/2) (434 - 434)**	0
Shoreline Sediment *(pCi/kg dry)*	**Gamma**	4							
	K-40	4		**8245 (2/2) (7070 - 9420)**	**HIR**	**0.6 mi N**	**8245 (2/2) (7070 - 9420)**	**4010 (2/2) (2290 - 5730)**	0
	Cs-134	4	150	< LLD	N/A		< LLD	< LLD	0
	Cs-137	4	180	< LLD	N/A		< LLD	< LLD	0
	Th-228	4		**479 (2/2) (76.5 - 882)**	**CHIC**	**11.2 mi WNW**	**877 (2/2) (523 - 1230)**	**877 (2/2) (523 - 1230)**	0
	Ra-226	4		**929 (2/2) (608 - 1250)**	**CHIC**	**11.2 mi WNW**	**1035 (2/2) (750 - 1320)**	**1035 (2/2) (750 - 1320)**	0
	Th-232	4		**765 (1/2) (765 - 765)**	**HIR**	**0.6 mi N**	**765 (1/2) (765 - 765)**	**764 (2/2) (438 - 1090)**	0
	Ac-228	4		**249 (1/2) (249 - 249)**	**HIR**	**0.6 mi N**	**249 (1/2) (249 - 249)**	< LLD	0
Fish *(pCi/kg wet)*	**Gamma**	4							
	K-40	4		**2033 (4/4) (692 - 3290)**	**SD**	**1.3 mi NNW**	**2033 (4/4) (692 - 3290)**	N/A	0
	Mn-54	4	130	< LLD	N/A		< LLD	N/A	0
	Co-58	4	130	< LLD	N/A		< LLD	N/A	0

Medium or Pathway Sampled (Units)	Analysis Type	Total No.	LLD	Indicator Locations Mean Range	Location with Highest Mean Name	Distance Direction	Mean Range	Control Locations Mean Range	Non-Routine Reported Measurements
Fish *(pCi/kg wet)*	Fe-59	4	260	< LLD	N/A		< LLD	N/A	0
	Co-60	4	130	< LLD	N/A		< LLD	N/A	0
	Zn-65	4	260	< LLD	N/A		< LLD	N/A	0
	Cs-134	4	130	< LLD	N/A		< LLD	N/A	0
	Cs-137	4	150	< LLD	N/A		< LLD	N/A	0
Oysters *(pCi/kg wet)*	**Gamma**	4							
	K-40	4		**886 (2/4) (622 - 1150)**	**POS**	**6.4 mi SSE**	**1150 (1/4) (1150 - 1150)**	N/A	0
	Mn-54	4	130	< LLD	N/A		< LLD	N/A	0
	Fe-59	4	260	< LLD	N/A		< LLD	N/A	0
	Co-58	4	130	< LLD	N/A		< LLD	N/A	0
	Co-60	4	130	< LLD	N/A		< LLD	N/A	0
	Zn-65	4	260	< LLD	N/A		< LLD	N/A	0
	Cs-134	4	130	< LLD	N/A		< LLD	N/A	0
	Cs-137	4	150	< LLD	N/A		< LLD	N/A	0
Clams *(pCi/kg wet)*	**Gamma**	8							
	K-40	8		**728 (1/6) (728 - 728)**	**SD**	**1.3 mi NNW**	**728 (1/6) (728 - 728)**	< LLD	0
	Th-228	8		**81.3 (2/6) (70.9 - 91.6)**	**LC**	**2.4 mi SE**	**81.3 (2/6) (70.9 - 91.6)**	< LLD	0

Medium or Pathway Sampled (Units)	Analysis Type	Analysis Total No.	LLD	Indicator Locations Mean Range	Location with Highest Mean Name	Location with Highest Mean Distance Direction	Location with Highest Mean Mean Range	Control Locations Mean Range	Non-Routine Reported Measurements
Clams *(pCi/kg wet)*	Ra-226	8		**931 (1/6)** **(931 - 931)**	**JI**	**3.9 mi NNW**	**931 (1/6)** **(931 - 931)**	< LLD	0
	Mn-54	8	130	< LLD	N/A		< LLD	< LLD	0
	Co-58	8	130	< LLD	N/A		< LLD	< LLD	0
	Fe-59	8	260	< LLD	N/A		< LLD	< LLD	0
	Co-60	8	130	< LLD	N/A		< LLD	< LLD	0
	Zn-65	8	260	< LLD	N/A		< LLD	< LLD	0
	Cs-134	8	130	< LLD	N/A		< LLD	< LLD	0
	Cs-137	8	150	< LLD	N/A		< LLD	< LLD	0
Crabs *(pCi/kg wet)*	**Gamma**	1							
	K-40	1		**1680 (1/1)** **(1680 - 1680)**	**SD**	**1.3 mi NNW**	**1680 (1/1)** **(1680 - 1680)**	N/A	0
	Mn-54	1	130	< LLD	N/A		< LLD	N/A	0
	Co-58	1	130	< LLD	N/A		< LLD	N/A	0
	Fe-59	1	260	< LLD	N/A		< LLD	N/A	0
	Co-60	1	130	< LLD	N/A		< LLD	N/A	0
	Zn-65	1	260	< LLD	N/A		< LLD	N/A	0
	Cs-134	1	130	< LLD	N/A		< LLD	N/A	0
	Cs-137	1	150	< LLD	N/A		< LLD	N/A	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 reported error is two times the standard deviation (2σ) 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 positive when the measured value exceeds 2σ uncertainty.

Teledyne Brown Engineering 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 Surry ODCM.

Data are given according to sample type as indicated below.

1. Gamma Exposure Rate
2. Air Particulates, Weekly Gross Beta Radioactivity
3. Air Particulates, Weekly I-131
4. Air Particulates, Quarterly Gamma Spectroscopy
5. Cow Milk
6. Food Products
7. Well Water
8. River Water
9. Silt
10. Shoreline Sediment
11. Fish
12. Oysters
13. Clams
14. Crabs

TABLE 3-2: GAMMA EXPOSURE RATE

Surry Power Station, Surry County, Virginia - 2010

mR/Std Month ± 2 Sigma

STATION NUMBER	FIRST QUARTER	SECOND QUARTER	THIRD QUARTER	FOURTH QUARTER	AVERAGE ± 2 SIGMA
02	4.9 ± 0.7	4.1 ± 0.5	3.6 ± 0.6	4.9 ± 0.6	4.4 ± 1.3
03	5.5 ± 7.9	3.7 ± 0.9	3.9 ± 1.1	4.9 ± 0.9	4.5 ± 1.7
04	4.2 ± 0.5	3.4 ± 0.9	3.6 ± 1.0	4.9 ± 1.8	4.0 ± 1.4
05	4.6 ± 0.8	2.9 ± 0.6	3.1 ± 0.7	4.5 ± 0.9	3.8 ± 1.8
06	4.4 ± 0.7	4.1 ± 0.5	3.6 ± 1.3	5.3 ± 2.0	4.4 ± 1.4
07	4.1 ± 0.4	3.7 ± 1.3	4.1 ± 0.4	4.8 ± 0.4	4.2 ± 0.9
08	3.7 ± 0.7	3.5 ± 1.5	3.3 ± 1.0	3.6 ± 0.7	3.5 ± 0.3
09	5.5 ± 7.8	4.4 ± 1.2	3.8 ± 1.0	4.3 ± 0.8	4.5 ± 1.4
10	4.5 ± 0.9	3.8 ± 1.4	3.4 ± 1.4	4.6 ± 0.5	4.1 ± 1.1
11	3.1 ± 0.6	2.7 ± 0.7	3.7 ± 2.4	3.4 ± 0.8	3.2 ± 0.9
12	3.5 ± 5.1	3.1 ± 0.5	3.0 ± 1.2	3.1 ± 0.4	3.2 ± 0.4
13	4.0 ± 0.8	3.3 ± 1.6	3.0 ± 0.3	3.8 ± 0.6	3.5 ± 0.9
14	4.4 ± 0.8	3.5 ± 1.5	3.9 ± 0.2	4.6 ± 1.2	4.1 ± 1.0
15	4.5 ± 0.9	4.2 ± 0.6	3.8 ± 0.3	4.3 ± 0.7	4.2 ± 0.6
16	4.3 ± 0.5	2.6 ± 0.4	3.1 ± 0.5	4.0 ± 0.9	3.5 ± 1.6
18	3.1 ± 0.7	1.3 ± 0.5	1.6 ± 0.7	2.7 ± 0.8	2.2 ± 1.7
19	2.4 ± 1.8	2.5 ± 1.4	2.1 ± 0.6	3.0 ± 0.7	2.5 ± 0.7
20	2.4 ± 3.4	1.9 ± 0.4	2.4 ± 0.9	3.0 ± 0.4	2.4 ± 0.9
21	2.8 ± 0.7	2.0 ± 0.5	2.2 ± 0.5	3.4 ± 2.1	2.6 ± 1.3
22	1.8 ± 0.6	1.1 ± 0.3	1.5 ± 0.2	2.1 ± 0.6	1.6 ± 0.9
23	3.7 ± 0.8	4.0 ± 0.4	3.3 ± 0.5	4.9 ± 1.7	4.0 ± 1.4
24	3.1 ± 4.4	2.0 ± 1.1	1.9 ± 0.1	2.8 ± 0.5	2.5 ± 1.2
25	4.2 ± 1.2	3.2 ± 1.6	2.6 ± 0.6	4.1 ± 0.2	3.5 ± 1.5
26	4.1 ± 5.8	3.6 ± 1.5	3.2 ± 0.2	4.0 ± 0.6	3.7 ± 0.8
27	2.7 ± 1.0	2.2 ± 0.9	1.9 ± 0.7	2.6 ± 0.4	2.4 ± 0.7
28	2.7 ± 1.1	1.7 ± 0.4	2.4 ± 1.9	2.9 ± 0.4	2.4 ± 1.1
29	2.1 ± 1.4	2.0 ± 1.4	2.0 ± 0.2	2.3 ± 1.1	2.1 ± 0.3
30	3.0 ± 1.8	1.6 ± 0.5	2.0 ± 0.2	3.0 ± 0.9	2.4 ± 1.4
31	1.3 ± 0.6	2.0 ± 0.5	1.5 ± 0.3	2.1 ± 1.4	1.7 ± 0.8
32	2.9 ± 1.2	1.8 ± 0.3	2.0 ± 0.3	2.8 ± 1.3	2.4 ± 1.1
33	3.2 ± 0.9	2.5 ± 1.0	2.9 ± 0.4	3.2 ± 2.0	3.0 ± 0.7
34	2.5 ± 0.6	2.5 ± 0.3	2.4 ± 0.5	2.9 ± 2.1	2.6 ± 0.4
35	4.1 ± 1.4	3.6 ± 1.8	2.9 ± 0.6	4.2 ± 0.8	3.7 ± 1.2
36	4.4 ± 1.0	2.9 ± 0.5	3.0 ± 0.5	4.4 ± 1.0	3.7 ± 1.7
37	2.9 ± 4.3	2.2 ± 0.8	2.6 ± 0.4	3.0 ± 0.8	2.7 ± 0.7
38	5.6 ± 7.9	5.3 ± 2.1	4.2 ± 0.4	6.0 ± 0.9	5.3 ± 1.5
39-C	2.8 ± 0.9	1.3 ± 0.5	1.7 ± 0.3	2.5 ± 0.4	2.1 ± 1.4
40-C	3.6 ± 0.4	2.7 ± 1.1	3.0 ± 1.5	3.8 ± 0.4	3.3 ± 1.0
41-C	5.9 ± 8.3	5.0 ± 0.6	4.5 ± 0.3	6.7 ± 2.6	5.5 ± 1.9
42	2.9 ± 1.0	3.4 ± 0.4	2.9 ± 1.0	2.9 ± 0.7	3.0 ± 0.5
43	2.2 ± 1.3	2.1 ± 3.5	2.0 ± 0.5	2.7 ± 0.7	2.3 ± 0.6

TABLE 3-3: GROSS BETA CONCENTRATION IN FILTERED AIR

Surry Power Station, Surry County, Virginia - 2010

1.0E-3 pCi/m3 ± 2 Sigma

COLLECTION DATE	SAMPLING LOCATIONS SS	HIR	BC	ALL	CP	BASF	FE	NN-C
January 05	16.6 ± 2.7	12.1 ± 2.6	14.7 ± 2.7	16.4 ± 2.8	10.1 ± 2.4	14.6 ± 2.7	15.2 ± 2.7	12.8 ± 2.5
January 12	13.8 ± 3.3	14.5 ± 3.4	16.6 ± 3.5	16.7 ± 3.5	13.3 ± 3.2	14.2 ± 3.3	19.7 ± 4.3	15.7 ± 3.5
January 19	25.2 ± 3.9	19.6 ± 3.7	22.7 ± 3.8	24.6 ± 4.0	20.5 ± 3.7	25.0 ± 3.9	25.1 ± 4.2	26.1 ± 3.9
January 26	16.1 ± 3.4	9.8 ± 3.2	15.4 ± 3.5	13.9 ± 3.4	15.0 ± 3.4	11.5 ± 3.2	13.2 ± 3.3	14.5 ± 3.3
February 02	20.2 ± 3.2	13.8 ± 2.9	22.1 ± 3.3	21.4 ± 3.3	19.3 ± 3.1	18.6 ± 3.1	16.5 ± 3.0	16.4 ± 3.0
February 08	12.9 ± 3.9	9.5 ± 3.9	18.0 ± 4.2	14.3 ± 4.1	15.0 ± 4.0	12.0 ± 3.9	13.4 ± 4.0	12.2 ± 3.9
February 16	10.9 ± 2.9	9.1 ± 2.8	10.9 ± 3.0	12.1 ± 3.0	12.3 ± 2.9	11.6 ± 2.9	12.7 ± 3.0	13.6 ± 3.0
February 23	10.5 ± 2.6	11.3 ± 2.7	9.3 ± 2.6	10.7 ± 2.7	11.5 ± 2.7	10.2 ± 2.6	10.9 ± 2.7	10.7 ± 2.7
March 02	10.6 ± 2.6	7.9 ± 2.5	9.3 ± 2.7	9.4 ± 2.7	8.3 ± 2.5	9.2 ± 2.6	8.3 ± 2.6	7.1 ± 2.4
March 09	14.1 ± 2.8	10.9 ± 2.7	11.9 ± 2.8	12.4 ± 2.8	10.6 ± 2.6	10.5 ± 2.6	13.0 ± 2.8	12.1 ± 2.8
March 16	9.6 ± 2.5	11.1 ± 2.6	14.0 ± 2.6	10.1 ± 2.6	9.3 ± 2.4	9.2 ± 2.5	9.2 ± 2.5	11.9 ± 2.5
March 24	12.4 ± 2.6	9.9 ± 2.5	13.6 ± 2.7	13.2 ± 2.7	12.1 ± 2.6	12.1 ± 2.6	14.1 ± 2.7	14.1 ± 2.8
March 30	9.8 ± 3.8	11.2 ± 3.9	11.1 ± 4.0	9.3 ± 3.9	10.1 ± 3.8	12.8 ± 3.9	-2.1 ± 3.2	8.6 ± 3.7
Qtr. Avg. ± 2 s.d.	**14.0 ± 9.1**	**11.6 ± 6.0**	**14.6 ± 8.7**	**14.2 ± 9.2**	**12.9 ± 7.4**	**13.2 ± 8.7**	**14.3 ± 9.2**	**13.5 ± 9.2**
April 06	7.7 ± 3.2	7.3 ± 3.2	11.0 ± 3.4	9.5 ± 3.3	9.4 ± 3.2	7.6 ± 3.2	8.9 ± 3.3	8.8 ± 3.2
April 13	14.7 ± 2.9	13.9 ± 2.9	14.0 ± 2.9	17.1 ± 3.1	13.5 ± 2.9	16.1 ± 3.0	16.9 ± 3.0	13.0 ± 2.8
April 20	13.6 ± 3.4	14.2 ± 3.5	10.8 ± 3.4	15.9 ± 3.6	16.2 ± 3.6	14.6 ± 3.5	17.2 ± 3.6	15.3 ± 3.5
April 27	18.1 ± 3.6	14.6 ± 3.5	16.4 ± 3.5	19.4 ± 3.7	16.5 ± 3.5	10.6 ± 3.2	15.7 ± 3.5	17.3 ± 3.5
May 04	9.3 ± 3.6	6.6 ± 3.6	8.1 ± 3.6	9.5 ± 3.7	9.8 ± 3.7	9.1 ± 3.6	10.1 ± 3.7	4.5 ± 3.4
May 11	19.9 ± 3.6	15.2 ± 3.5	13.7 ± 3.4	17.4 ± 3.6	19.9 ± 3.7	13.7 ± 3.4	19.1 ± 3.6	13.3 ± 3.3
May 18	11.8 ± 2.7	10.6 ± 2.7	10.9 ± 2.7	13.5 ± 2.9	11.5 ± 2.7	8.8 ± 2.5	9.4 ± 2.6	8.9 ± 2.6
May 25	9.2 ± 3.0	11.1 ± 3.1	10.7 ± 3.2	8.5 ± 3.1	9.0 ± 3.1	5.9 ± 2.9	10.7 ± 3.2	6.3 ± 2.9
June 01	13.2 ± 3.1	14.4 ± 3.2	14.3 ± 3.1	15.5 ± 3.2	14.8 ± 3.1	13.3 ± 3.0	13.6 ± 3.1	14.9 ± 3.1
June 08	14.1 ± 3.3	11.5 ± 3.3	12.4 ± 3.3	12.5 ± 3.3	14.5 ± 3.4	10.7 ± 3.2	12.1 ± 3.3	10.4 ± 3.1
June 15	14.5 ± 3.5	11.9 ± 3.5	14.3 ± 3.6	11.9 ± 3.5	11.1 ± 3.4	10.8 ± 3.3	13.3 ± 3.5	11.6 ± 3.4
June 22	15.6 ± 3.4	14.7 ± 3.5	12.5 ± 3.4	13.9 ± 3.5	13.6 ± 3.4	11.1 ± 3.3	15.9 ± 3.5	12.1 ± 3.3
June 29	16.7 ± 3.3	16.4 ± 3.4	17.7 ± 3.4	19.9 ± 3.6	19.0 ± 3.5	17.5 ± 3.4	-1.7 ± 2.4	19.1 ± 3.4
Qtr. Avg. ± 2 s.d.	**13.7 ± 7.1**	**12.5 ± 6.0**	**12.8 ± 5.2**	**14.2 ± 7.5**	**13.8 ± 7.1**	**11.5 ± 6.7**	**13.6 ± 6.8**	**12.6 ± 8.4**

TABLE 3-3: GROSS BETA CONCENTRATION IN FILTERED AIR

Surry Power Station, Surry County, Virginia - 2010

1.0E-3 pCi/m3 ± 2 Sigma

COLLECTION DATE	SAMPLING LOCATIONS SS	HIR	BC	ALL	CP	BASF	FE	NN-C
July 06	16.0 ± 3.4	7.9 ± 3.1	14.4 ± 3.4	13.8 ± 3.4	10.5 ± 3.2	8.8 ± 3.0	8.8 ± 3.1	9.2 ± 3.0
July 13	23.3 ± 3.6	19.0 ± 3.5	18.5 ± 3.5	22.2 ± 3.7	23.3 ± 3.7	18.7 ± 3.5	16.6 ± 3.4	21.6 ± 3.6
July 20	18.9 ± 3.4	14.1 ± 3.3	14.4 ± 3.3	19.2 ± 3.5	18.6 ± 3.4	14.0 ± 3.2	18.4 ± 3.4	15.7 ± 3.3
July 27	17.2 ± 3.6	15.7 ± 3.6	0.5 ± 2.8	18.1 ± 3.7	15.3 ± 3.5	10.8 ± 3.3	14.7 ± 3.5	16.2 ± 3.5
August 03	11.1 ± 3.0	13.0 ± 3.1	12.5 ± 3.1	7.3 ± 2.8	11.8 ± 3.0	9.6 ± 2.9	9.3 ± 2.9	13.9 ± 3.1
August 09	19.3 ± 4.1	15.9 ± 3.9	18.7 ± 3.9	11.0 ± 3.9	17.7 ± 3.9	25.5 ± 4.1	18.3 ± 3.8	23.9 ± 4.1
August 17	19.0 ± 3.3	15.0 ± 3.1	15.1 ± 3.1	10.6 ± 2.8	16.7 ± 3.2	18.5 ± 3.2	15.4 ± 3.0	20.6 ± 3.3
August 24	18.1 ± 3.7	12.0 ± 3.4	20.7 ± 3.8	9.7 ± 3.3	20.0 ± 3.8	18.0 ± 3.7	12.1 ± 3.4	18.8 ± 3.7
August 31	14.7 ± 3.1	12.9 ± 3.0	17.6 ± 3.7	23.1 ± 3.5	20.5 ± 3.4	14.0 ± 3.1	14.4 ± 3.1	19.3 ± 3.3
September 07	25.0 ± 3.7	21.3 ± 3.5	30.7 ± 4.0	34.4 ± 4.0	21.5 ± 3.5	27.1 ± 3.7	22.4 ± 3.5	31.5 ± 3.9
September 14	17.3 ± 3.2	13.4 ± 3.0	15.4 ± 3.2	21.3 ± 3.3	13.4 ± 3.0	16.5 ± 3.2	22.9 ± 3.4	20.5 ± 3.4
September 21	10.5 ± 2.9	24.1 ± 3.6	11.8 ± 3.0	30.7 ± 3.8	26.5 ± 3.7	22.3 ± 3.5	20.6 ± 3.4	30.0 ± 3.9
September 28	8.3 ± 2.9	24.1 ± 3.7	10.4 ± 3.0	32.2 ± 4.0	22.9 ± 3.6	27.9 ± 3.8	18.8 ± 3.4	27.0 ± 3.8
Qtr. Avg. ± 2 s.d.	**16.8 ± 9.6**	**16.0 ± 9.7**	**16.7 ± 13.6**	**19.5 ± 17.9**	**18.4 ± 9.5**	**17.8 ± 12.9**	**16.4 ± 9.0**	**20.6 ± 12.7**
October 05	3.3 ± 2.6	6.6 ± 2.8	5.7 ± 2.7	8.1 ± 2.8	10.2 ± 3.0	8.8 ± 2.9	7.1 ± 2.8	8.5 ± 2.8
October 12	7.4 ± 2.7	24.5 ± 3.6	13.7 ± 3.0	30.3 ± 3.8	25.0 ± 3.6	27.7 ± 3.7	20.4 ± 3.3	29.0 ± 3.7
October 18	8.6 ± 3.1	23.4 ± 3.9	11.2 ± 3.2	34.3 ± 4.3	23.2 ± 3.9	27.3 ± 4.0	22.2 ± 3.8	31.3 ± 4.2
October 26	8.5 ± 2.6	18.8 ± 3.1	10.7 ± 2.7	24.1 ± 3.3	22.7 ± 3.3	21.9 ± 3.2	18.6 ± 3.1	26.7 ± 3.4
November 02	4.5 ± 2.6	12.0 ± 3.0	7.3 ± 2.7	17.1 ± 3.2	10.9 ± 3.0	14.3 ± 3.1	11.7 ± 3.0	15.7 ± 3.2
November 09	3.2 ± 2.3	10.3 ± 2.8	4.8 ± 2.4	12.1 ± 2.8	12.4 ± 2.9	10.2 ± 2.7	9.1 ± 2.6	14.9 ± 3.0
November 16	6.9 ± 2.7	11.3 ± 3.0	7.5 ± 2.7	17.9 ± 3.2	13.4 ± 3.1	15.3 ± 3.1	13.4 ± 3.0	21.6 ± 3.4
November 23	11.0 ± 2.5	28.1 ± 3.5	26.5 ± 3.3	36.1 ± 3.7	28.0 ± 3.4	30.7 ± 3.5	24.7 ± 3.2	33.7 ± 3.6
November 30	6.8 ± 2.6	13.3 ± 3.1	15.4 ± 3.1	16.6 ± 3.1	15.1 ± 3.1	15.4 ± 3.1	14.3 ± 3.0	16.7 ± 3.1
December 07	5.5 ± 2.6	15.0 ± 3.1	16.8 ± 3.2	21.7 ± 3.4	16.1 ± 3.2	15.4 ± 3.1	21.1 ± 3.7	21.1 ± 3.4
December 14	5.1 ± 2.5	14.4 ± 3.2	18.5 ± 3.3	19.5 ± 3.3	18.4 ± 3.3	15.4 ± 3.2	18.5 ± 3.7	22.0 ± 3.6
December 21	8.2 ± 2.9	16.8 ± 3.3	20.8 ± 3.4	26.8 ± 3.7	22.1 ± 3.5	24.5 ± 3.6	17.7 ± 3.3	22.9 ± 3.6
December 29	5.4 ± 1.7	7.1 ± 1.8	6.7 ± 1.8	3.8 ± 1.5	6.3 ± 1.8	4.7 ± 1.6	7.4 ± 1.8	6.4 ± 1.8
Qtr. Avg. ± 2 s.d.	**7.1 ± 4.6**	**15.5 ± 13.2**	**12.7 ± 13.2**	**20.6 ± 19.3**	**17.2 ± 13.2**	**17.8 ± 15.9**	**15.9 ± 11.6**	**20.8 ± 16.6**
Ann. Avg. ± 2 s.d.	**13.1 ± 10.4**	**13.9 ± 9.8**	**14.2 ± 10.1**	**17.1 ± 15.3**	**15.6 ± 10.4**	**15.1 ± 12.6**	**15.1 ± 9.4**	**17.0 ± 14.0**

TABLE 3-4: IODINE-131 CONCENTRATION IN FILTERED AIR

Surry Power Station, Surry County, Virginia - 2010

1.0E-3 pCi/m3 ± 2 Sigma

COLLECTION DATE	SAMPLING LOCATIONS SS	HIR	BC	ALL	CP	BASF	FE	NN-C
January 05	2.5 ± 17.3	2.6 ± 17.8	2.6 ± 18.0	2.6 ± 17.9	-10.3 ± 22.9	-10.5 ± 23.2	-10.5 ± 23.3	-10.3 ± 22.9
January 12	-9.8 ± 18.2	-10.1 ± 18.7	-10.1 ± 18.8	-10.0 ± 18.6	6.2 ± 27.1	6.2 ± 27.4	7.9 ± 34.7	6.4 ± 28.0
January 19	-5.3 ± 7.6	-9.9 ± 14.1	-9.8 ± 14.0	-9.9 ± 14.2	-9.5 ± 8.7	-17.4 ± 15.9	-19.2 ± 17.6	-17.3 ± 15.9
January 26	-14.3 ± 19.6	-14.6 ± 20.1	-14.6 ± 20.1	-14.7 ± 20.3	25.4 ± 17.5	25.7 ± 17.7	25.7 ± 17.8	25.1 ± 17.3
February 02	9.1 ± 14.0	9.4 ± 14.4	9.4 ± 14.4	9.4 ± 14.4	-10.5 ± 17.8	-10.6 ± 18.0	-10.6 ± 17.9	-10.6 ± 18.0
February 08	-3.4 ± 9.8	-3.5 ± 10.1	-3.5 ± 10.0	-3.5 ± 10.1	0.3 ± 7.7	0.3 ± 7.8	0.3 ± 7.8	0.3 ± 7.8
February 16	0.3 ± 4.4	0.3 ± 4.6	0.3 ± 4.6	0.3 ± 4.6	-1.1 ± 5.8	-1.1 ± 5.9	-1.1 ± 5.9	-1.1 ± 5.9
February 23	2.2 ± 13.2	2.3 ± 13.6	2.3 ± 13.6	2.3 ± 13.6	4.2 ± 11.8	4.2 ± 11.8	4.2 ± 12.0	4.2 ± 11.9
March 02	0.1 ± 3.1	0.1 ± 3.2	0.1 ± 3.2	0.1 ± 3.2	-0.3 ± 4.1	-0.3 ± 4.1	-0.3 ± 4.1	-0.3 ± 4.0
March 09	14.1 ± 12.4	14.6 ± 12.8	14.8 ± 12.9	14.6 ± 12.8	-5.2 ± 13.9	-5.2 ± 14.0	-5.3 ± 14.1	-5.3 ± 14.1
March 16	-2.7 ± 4.8	-2.8 ± 4.9	-2.8 ± 4.9	-2.8 ± 5.0	3.5 ± 8.0	3.5 ± 8.1	3.5 ± 8.1	3.5 ± 8.0
March 24	1.7 ± 14.2	1.7 ± 14.4	1.7 ± 14.6	1.7 ± 14.5	1.1 ± 16.0	1.1 ± 16.0	1.1 ± 16.2	1.1 ± 16.5
March 30	-7.8 ± 17.2	-7.9 ± 17.3	-8.0 ± 17.5	-8.0 ± 17.4	-9.4 ± 15.0	-9.4 ± 15.0	-9.5 ± 15.1	-9.4 ± 14.9
April 06	-2.5 ± 11.7	-2.5 ± 11.8	-2.5 ± 11.8	-2.5 ± 11.8	-5.5 ± 15.2	-5.6 ± 15.3	-5.6 ± 15.5	-5.4 ± 14.9
April 13	-3.9 ± 9.2	-3.9 ± 9.3	-3.9 ± 9.3	-3.9 ± 9.3	-20.7 ± 14.5	-20.4 ± 14.2	-20.5 ± 14.4	-20.4 ± 14.3
April 20	-8.6 ± 12.7	-8.6 ± 12.8	-8.8 ± 13.1	-8.7 ± 13.0	-3.0 ± 6.7	-2.9 ± 6.6	-2.9 ± 6.5	-2.9 ± 6.6
April 27	-2.6 ± 7.8	-2.6 ± 8.0	-2.6 ± 8.0	-2.6 ± 8.1	7.2 ± 12.6	7.1 ± 12.5	7.1 ± 12.4	7.0 ± 12.2
May 04	-4.3 ± 11.3	-4.4 ± 11.6	-4.4 ± 11.6	-4.4 ± 11.7	-7.4 ± 16.1	-7.2 ± 15.9	-7.4 ± 16.2	-7.2 ± 15.8
May 11	5.7 ± 10.5	5.8 ± 10.7	5.8 ± 10.7	5.9 ± 10.9	0.2 ± 15.1	0.2 ± 14.9	0.2 ± 15.2	0.2 ± 14.8
May 18	2.9 ± 10.2	3.0 ± 10.3	3.0 ± 10.3	3.0 ± 10.4	4.0 ± 14.4	3.9 ± 14.0	4.0 ± 14.3	3.9 ± 14.0
May 25	-1.5 ± 16.7	-1.5 ± 16.9	-1.6 ± 17.7	-1.6 ± 18.0	-5.6 ± 24.3	-5.5 ± 24.0	-5.6 ± 24.3	-5.5 ± 23.8
June 01	-0.4 ± 25.1	-0.4 ± 25.9	-0.4 ± 25.1	-0.4 ± 25.4	11.7 ± 27.1	11.7 ± 27.0	11.8 ± 27.3	11.5 ± 26.6
June 08	-7.5 ± 13.6	-7.8 ± 14.0	-7.7 ± 13.9	-7.8 ± 14.0	-2.8 ± 19.0	-2.7 ± 18.8	-2.8 ± 19.1	-2.7 ± 18.6
June 15	11.1 ± 10.6	11.4 ± 10.9	11.4 ± 10.9	11.4 ± 10.9	-1.0 ± 15.7	-0.9 ± 15.4	-1.0 ± 15.6	-0.9 ± 15.2
June 22	-1.5 ± 8.1	-1.5 ± 8.3	-1.5 ± 8.3	-1.5 ± 8.4	2.2 ± 9.1	2.1 ± 8.9	2.2 ± 9.1	2.1 ± 8.9
June 29	-4.4 ± 15.5	-4.5 ± 16.0	-4.5 ± 15.8	-4.5 ± 16.1	11.1 ± 15.5	11.0 ± 15.3	10.9 ± 15.3	10.9 ± 15.2

TABLE 3-4: IODINE-131 CONCENTRATION IN FILTERED AIR

Surry Power Station, Surry County, Virginia - 2010

1.0E-3 pCi/m3 ± 2 Sigma

COLLECTION DATE	SAMPLING LOCATIONS SS	HIR	BC	ALL	CP	BASF	FE	NN-C
July 06	-1.3 ± 3.2	-2.8 ± 6.8	-1.3 ± 3.2	-1.3 ± 3.3	-0.7 ± 3.6	-0.7 ± 3.5	-0.7 ± 3.6	-0.7 ± 3.5
July 13	-2.3 ± 7.4	-2.3 ± 7.6	-2.3 ± 7.6	-2.3 ± 7.6	1.6 ± 10.3	1.5 ± 10.2	1.6 ± 10.4	1.5 ± 10.1
July 20	-1.6 ± 9.1	-1.7 ± 9.3	-1.7 ± 9.3	-1.7 ± 9.4	1.3 ± 11.2	1.3 ± 11.0	1.3 ± 11.2	1.3 ± 11.1
July 27	12.8 ± 9.9	13.0 ± 10.1	12.8 ± 9.9	13.2 ± 10.2	5.6 ± 12.2	5.5 ± 11.9	5.5 ± 12.1	5.4 ± 11.8
August 03	-4.1 ± 17.2	-4.1 ± 17.1	-4.1 ± 17.1	-4.0 ± 16.7	11.0 ± 17.1	11.0 ± 17.0	11.1 ± 17.2	10.7 ± 16.7
August 09	5.4 ± 12.5	5.4 ± 12.5	5.1 ± 11.8	5.8 ± 13.4	-0.2 ± 18.2	-0.2 ± 17.7	-0.2 ± 17.6	-0.2 ± 17.7
August 17	-15.8 ± 15.4	-15.8 ± 15.4	-15.8 ± 15.5	-15.4 ± 15.1	-2.6 ± 16.3	-2.5 ± 15.9	-2.5 ± 15.9	-2.5 ± 15.9
August 24	2.9 ± 14.8	2.9 ± 14.8	2.9 ± 14.8	2.8 ± 14.6	1.2 ± 19.6	1.2 ± 19.1	1.2 ± 19.1	1.2 ± 19.0
August 31	5.2 ± 11.2	5.2 ± 11.2	6.0 ± 13.0	5.0 ± 10.9	0.7 ± 15.6	0.7 ± 15.2	0.7 ± 15.1	0.7 ± 15.3
September 07	-3.8 ± 9.1	-3.8 ± 9.1	-4.0 ± 9.5	-3.7 ± 8.9	-1.3 ± 6.5	-1.3 ± 6.4	-1.3 ± 6.3	-1.3 ± 6.3
September 14	-2.8 ± 12.7	-2.8 ± 12.7	-2.9 ± 13.0	-2.8 ± 12.5	-2.1 ± 17.4	-2.1 ± 17.4	-2.1 ± 17.1	-2.1 ± 1.7
September 21	-2.4 ± 12.7	-2.4 ± 13.0	-2.4 ± 12.7	-2.4 ± 12.7	-5.9 ± 8.8	-5.8 ± 8.6	-5.8 ± 8.6	-5.8 ± 8.7
September 28	3.4 ± 8.6	3.4 ± 8.8	3.4 ± 8.6	3.4 ± 8.6	0.8 ± 10.8	0.8 ± 10.7	0.8 ± 10.7	0.8 ± 10.7
October 05	9.0 ± 16.5	9.3 ± 16.9	8.9 ± 16.3	8.9 ± 16.2	-4.3 ± 26.0	-4.3 ± 25.7	-4.3 ± 25.6	-4.2 ± 25.4
October 12	5.7 ± 11.2	5.9 ± 11.5	5.7 ± 11.2	5.7 ± 11.2	-0.1 ± 18.5	-0.1 ± 18.2	-0.1 ± 18.2	-0.1 ± 18.1
October 18	-5.6 ± 18.6	-5.7 ± 19.1	-5.6 ± 18.6	-5.6 ± 18.6	3.6 ± 15.1	3.5 ± 14.9	3.5 ± 14.9	3.5 ± 14.8
October 26	-13.8 ± 19.9	-14.1 ± 20.3	-13.8 ± 19.8	-13.7 ± 19.8	1.4 ± 20.5	1.4 ± 20.3	1.4 ± 20.2	1.4 ± 20.1
November 02	11.5 ± 26.2	11.8 ± 26.9	11.5 ± 26.2	11.5 ± 26.2	-1.3 ± 40.1	-1.3 ± 39.9	-1.3 ± 39.9	-1.3 ± 39.9
November 09	1.8 ± 16.0	1.9 ± 16.6	1.8 ± 16.0	1.8 ± 16.0	0.5 ± 20.7	0.4 ± 20.6	0.4 ± 20.2	0.4 ± 20.3
November 16	-10.0 ± 15.3	-10.3 ± 15.8	-10.0 ± 15.3	-9.9 ± 15.2	9.3 ± 15.1	9.2 ± 14.9	9.1 ± 14.7	9.2 ± 14.9
November 23	-11.3 ± 17.3	-11.7 ± 17.9	-11.4 ± 17.5	-11.3 ± 17.3	10.1 ± 29.6	10.0 ± 29.4	9.8 ± 28.9	9.9 ± 29.1
November 30	-6.8 ± 11.6	-7.1 ± 12.0	-7.0 ± 11.7	-6.8 ± 11.6	6.7 ± 19.4	6.6 ± 19.2	6.5 ± 19.0	6.6 ± 19.1
December 07	13.4 ± 15.3	13.8 ± 15.8	13.6 ± 15.5	13.4 ± 15.2	-6.7 ± 15.5	-6.1 ± 15.3	-6.8 ± 17.1	-6.0 ± 15.2
December 14	-6.8 ± 16.0	-7.2 ± 17.1	-7.2 ± 16.9	-7.1 ± 16.7	4.6 ± 23.5	4.5 ± 23.2	5.3 ± 27.1	4.7 ± 24.2
December 21	-21.9 ± 34.1	-22.1 ± 34.4	-21.6 ± 33.6	-21.3 ± 33.1	-0.4 ± 33.9	-0.4 ± 33.2	-0.4 ± 33.1	-0.4 ± 34.4
December 29	0.1 ± 13.3	0.1 ± 13.6	0.1 ± 13.6	0.1 ± 13.4	-3.7 ± 19.2	-3.7 ± 19.1	-3.7 ± 19.2	-3.8 ± 20.0

TABLE 3-5: GAMMA EMITTER CONCENTRATION IN FILTERED AIR

Surry Power Station, Surry County, Virginia - 2010

1.0E-3 pCi/m3 ± 2 Sigma

SAMPLING LOCATIONS	NUCLIDE	FIRST QUARTER	SECOND QUARTER	THIRD QUARTER	FOURTH QUARTER	AVERAGE ± 2 SIGMA
SS	Cs-134	0.99 ± 0.99	1.39 ± 1.21	-0.33 ± 0.66	0.60 ± 0.73	
	Cs-137	0.41 ± 0.64	-0.05 ± 0.82	0.05 ± 0.76	0.29 ± 0.68	
	Be-7	141 ± 29.0	198 ± 38.7	126 ± 32.7	54.1 ± 22.2	130 ± 118
HIR	Cs-134	0.30 ± 0.70	1.66 ± 1.64	-0.24 ± 0.93	-1.15 ± 1.33	
	Cs-137	0.57 ± 0.75	-0.15 ± 1.27	0.15 ± 0.81	-0.28 ± 0.94	
	Be-7	139 ± 24.4	186 ± 39.4	121 ± 32.9	129 ± 28.7	144 ± 58.2
BC	Cs-134	0.50 ± 0.88	0.34 ± 1.67	1.22 ± 0.87	0.86 ± 0.96	
	Cs-137	0.39 ± 0.94	-0.05 ± 1.11	0.32 ± 0.83	-0.43 ± 0.97	
	Be-7	174 ± 36.2	135 ± 34.8	132 ± 29.8	84.6 ± 27.3	131 ± 73.2
ALL	Cs-134	0.26 ± 1.09	0.17 ± 1.21	-0.47 ± 0.82	0.08 ± 1.03	
	Cs-137	0.13 ± 0.70	0.85 ± 1.12	-0.02 ± 0.74	-0.47 ± 0.69	
	Be-7	195 ± 31.2	203 ± 43.0	138 ± 32.6	149 ± 29.5	171 ± 65.0
CP	Cs-134	0.52 ± 0.73	1.06 ± 1.74	0.35 ± 1.20	-0.25 ± 0.59	
	Cs-137	0.33 ± 0.84	-0.06 ± 1.22	-0.03 ± 0.98	0.00 ± 0.55	
	Be-7	142 ± 33.3	225 ± 54.2	156 ± 36.9	149 ± 21.9	168 ± 77
	K-40	12.0 ± 10.6				12.0 ± 10.6
BASF	Cs-134	0.77 ± 1.04	1.34 ± 1.12	0.16 ± 0.97	-0.07 ± 0.65	
	Cs-137	0.27 ± 1.01	-0.31 ± 1.14	-0.92 ± 0.90	0.46 ± 0.61	
	Be-7	184 ± 37.6	158 ± 39.7	122 ± 29.1	133 ± 22.6	149 ± 55.3
FE	Cs-134	0.90 ± 0.90	0.90 ± 1.55	0.57 ± 0.79	0.72 ± 0.88	
	Cs-137	-0.07 ± 0.66	-1.03 ± 1.60	0.41 ± 0.65	-0.16 ± 0.78	
	Be-7	154 ± 29.7	199 ± 52.4	121 ± 28.4	132 ± 27.0	152 ± 69.0
NN-C	Cs-134	0.45 ± 0.77	0.96 ± 1.20	0.49 ± 0.63	0.27 ± 0.67	
	Cs-137	-0.19 ± 0.73	0.20 ± 1.23	-0.39 ± 0.62	0.31 ± 0.65	
	Be-7	160 ± 29.1	173 ± 44.3	139 ± 30.9	133 ± 26.5	151 ± 37.1
	K-40	16.4 ± 15.3				16.4 ± 15.3

TABLE 3-6: GAMMA EMITTER AND STRONTIUM CONCENTRATIONS IN MILK

Surry Power Station, Surry County, Virginia - 2010

pCi/Liter ± 2 Sigma

NUCLIDE	EPPS	COLONIAL PARKWAY	WILLIAMS-C
JANUARY			
Cs-134	-0.84 ± 1.82	-0.18 ± 3.48	0.27 ± 3.11
Cs-137	2.95 ± 1.79	-0.07 ± 3.38	0.26 ± 3.33
Ba-140	4.45 ± 19.1	30.0 ± 30.3	-13.0 ± 26.4
La-140	-2.24 ± 6.25	2.35 ± 8.05	-2.96 ± 7.56
I-131	-0.22 ± 0.37	-0.21 ± 0.35	-0.21 ± 0.37
K-40	1299 ± 102	1308 ± 121	1139 ± 130
Th-228	10.2 ± 4.5		
FEBRUARY			
Cs-134	1.02 ± 4.87	-2.04 ± 3.67	1.52 ± 4.65
Cs-137	4.73 ± 5.82	-2.20 ± 3.98	-4.77 ± 5.33
Ba-140	-0.27 ± 22.4	4.09 ± 16.3	-17.9 ± 23.1
La-140	0.49 ± 6.83	2.34 ± 5.16	-4.52 ± 7.20
I-131	0.00 ± 0.36	-0.07 ± 0.33	-0.16 ± 0.3
K-40	1286 ± 187	1272 ± 152	1370 ± 182
MARCH			
Cs-134	-6.15 ± 5.00	-2.24 ± 3.64	-3.25 ± 4.10
Cs-137	2.00 ± 4.66	-0.69 ± 4.08	3.33 ± 3.19
Ba-140	-1.16 ± 25.3	-9.99 ± 20.5	-10.0 ± 16.1
La-140	8.13 ± 6.78	-1.38 ± 5.70	-0.874 ± 4.23
I-131	-0.06 ± 0.27	-0.23 ± 0.41	-0.01 ± 0.28
K-40	1256 ± 129	1457 ± 162	1316 ± 89.2
Th-228			11.6 ± 8.76
Sr-89		-0.93 ± 2.17	
Sr-90		0.59 ± 0.45	
APRIL			
Cs-134	-2.27 ± 3.58	0.76 ± 3.57	-1.69 ± 3.55
Cs-137	1.97 ± 4.45	-0.01 ± 3.82	0.87 ± 3.24
Ba-140	-0.91 ± 20.3	14.1 ± 15.7	-2.88 ± 17.7
La-140	0.02 ± 5.83	4.06 ± 4.85	-0.24 ± 5.62
I-131	0.13 ± 0.51	0.73 ± 0.67	-0.08 ± 0.56
K-40	1209 ± 142	1375 ± 123	1308 ± 137

TABLE 3-6: GAMMA EMITTER AND STRONTIUM CONCENTRATIONS IN MILK

Surry Power Station, Surry County, Virginia - 2010

pCi/Liter ± 2 Sigma

NUCLIDE	EPPS	COLONIAL PARKWAY	WILLIAMS-C
MAY			
Cs-134	3.78 ± 2.90	0.18 ± 1.24	4.50 ± 4.22
Cs-137	0.32 ± 3.60	0.28 ± 1.19	2.10 ± 4.01
Ba-140	-20.10 ± 22.80	-0.13 ± 7.82	-15.40 ± 26.60
La-140	0.29 ± 6.77	-0.30 ± 3.22	0.99 ± 6.65
I-131	-0.30 ± 0.32	0.21 ± 0.37	-0.49 ± 0.38
K-40	1268 ± 124	1292 ± 126	1349 ± 111
Th-228		10.7 ± 7.37	
JUNE			
Cs-134	-0.81 ± 2.81	-0.96 ± 3.17	0.37 ± 4.53
Cs-137	1.24 ± 2.67	-1.80 ± 3.29	2.19 ± 3.76
Ba-140	-6.49 ± 17.6	-15.2 ± 23.3	10.0 ± 25.2
La-140	-4.65 ± 5.37	-4.62 ± 7.27	-4.73 ± 6.66
I-131	0.32 ± 0.51	0.70 ± 0.50	0.33 ± 0.52
K-40	1233 ± 103	1382 ± 130	1338 ± 111
Sr-89		-0.42 ± 1.82	
Sr-90		1.26 ± 0.72	
JULY			
Cs-134	-6.29 ± 3.68	-2.76 ± 3.48	-4.22 ± 4.32
Cs-137	-0.30 ± 3.65	-0.12 ± 2.99	3.33 ± 4.08
Ba-140	-7.2 ± 15.2	11.1 ± 14.4	4.76 ± 20.1
La-140	2.29 ± 4.34	-4.53 ± 4.00	0.59 ± 4.37
I-131	0.37 ± 0.42	0.06 ± 0.40	0.16 ± 0.37
K-40	1173 ± 133	1377 ± 121	1229 ± 127
AUGUST			
Cs-134	-5.75 ± 3.49	0.12 ± 5.11	0.84 ± 4.01
Cs-137	-0.09 ± 3.62	-1.95 ± 5.34	-0.43 ± 3.59
Ba-140	16.0 ± 23.0	-13.80 ± 33.5	8.08 ± 26.9
La-140	1.07 ± 7.65	-9.32 ± 9.43	-0.25 ± 6.01
I-131	0.36 ± 0.39	0.07 ± 0.35	0.34 ± 0.38
K-40	1184 ± 127	1315 ± 177	1185 ± 160

TABLE 3-6: GAMMA EMITTER AND STRONTIUM CONCENTRATIONS IN MILK

Surry Power Station, Surry County, Virginia - 2010

pCi/Liter ± 2 Sigma

NUCLIDE	EPPS	COLONIAL PARKWAY	WILLIAMS-C
SEPTEMBER			
Cs-134	-1.25 ± 3.43	-1.14 ± 2.67	0.69 ± 3.23
Cs-137	3.67 ± 3.57	2.40 ± 2.18	-0.49 ± 2.85
Ba-140	-5.62 ± 16.8	-3.42 ± 11.0	-6.37 ± 14.4
La-140	2.56 ± 4.79	-1.19 ± 3.25	-1.98 ± 3.88
I-131	-0.22 ± 0.46	-0.14 ± 0.54	0.05 ± 0.52
K-40	1143 ± 128	1168 ± 100	1149 ± 114
Sr-89		-1.47 ± 2.08	
Sr-90		0.27 ± 0.22	
OCTOBER			
Cs-134	-1.72 ± 3.99	-5.76 ± 4.58	-3.97 ± 3.94
Cs-137	1.78 ± 3.94	-2.15 ± 4.43	-0.96 ± 3.84
Ba-140	4.32 ± 14.9	-11.90 ± 19.8	-21.7 ± 18.8
La-140	-0.53 ± 4.85	0.66 ± 6.04	-0.38 ± 4.67
I-131	-0.19 ± 0.30	0.19 ± 0.32	0.05 ± 0.31
K-40	1141 ± 143	1259 ± 164	1232 ± 145
Th-228	15.4 ± 11.0		
NOVEMBER			
Cs-134	-3.62 ± 3.97	1.50 ± 2.27	-7.17 ± 3.14
Cs-137	1.34 ± 3.96	0.39 ± 2.09	0.11 ± 3.35
Ba-140	-13.0 ± 16.7	-2.20 ± 9.75	7.05 ± 13.6
La-140	1.22 ± 4.09	1.31 ± 2.86	-1.80 ± 4.38
I-131	-0.28 ± 0.52	-0.12 ± 0.54	-0.15 ± 0.44
K-40	1247 ± 131	1210 ± 104	1319 ± 122
DECEMBER			
Cs-134	0.65 ± 3.52	-10.90 ± 4.20	-0.27 ± 3.27
Cs-137	2.14 ± 3.47	0.00 ± 4.57	1.78 ± 4.04
Ba-140	7.51 ± 22.9	3.48 ± 16.8	12.2 ± 19.9
La-140	6.42 ± 6.21	2.08 ± 6.21	-0.27 ± 5.94
I-131	0.15 ± 0.29	0.07 ± 0.28	-0.49 ± 0.29
K-40	1127 ± 116	1225 ± 155	1308 ± 146
Sr-89		0.31 ± 2.07	
Sr-90		0.60 ± 0.51	

TABLE 3-7: GAMMA EMITTER CONCENTRATION IN FOOD PRODUCTS

Surry Power Station, Surry County, Virginia - 2010

pCi/kg (wet) ± 2 Sigma Page 1 of 1

SAMPLING LOCATIONS	COLLECTION DATE	SAMPLE TYPE	Cs-134	Cs-137	I-131	K-40	Th-228
BROCK FARM	11/16/2010	Corn	-4.94 ± 9.47	0.51 ± 8.34	0.18 ± 26.0	2660 ± 294	9.39 ± 22.2
	11/16/2010	Peanuts	-6.49 ± 8.54	10.4 ± 7.19	14.4 ± 26.0	8330 ± 290	22.3 ± 14.8
SLADE FARM	11/16/2010	Soybeans	-5.13 ± 10.8	1.84 ± 9.52	9.58 ± 29.4	15400 ± 582	5.85 ± 14.4

TABLE 3-8: GAMMA EMITTER AND TRITIUM CONCENTRATIONS IN WELL WATER

Surry Power Station, Surry County, Virginia - 2010

pCi/Liter ± 2 Sigma

SAMPLING LOCATIONS	COLLECTION DATE	ISOTOPE				
		Mn-54	**Fe-59**	**Co-58**	**Co-60**	**Zn-65**
SS	3/9/2010	-0.85 ± 1.81	0.80 ± 3.60	-1.37 ± 1.73	0.35 ± 1.76	-0.57 ± 4.19
	6/8/2010	0.369 ± 2.16	0.05 ± 5.11	0.61 ± 2.66	-0.13 ± 2.23	-1.08 ± 5.60
	9/14/2010	1.42 ± 2.36	1.44 ± 4.50	-0.65 ± 2.32	0.63 ± 2.26	-6.31 ± 6.05
	12/10/2010	1.25 ± 2.66	3.54 ± 7.31	-1.69 ± 2.57	-2.39 ± 3.11	-1.91 ± 6.75
		Zr-95	**Nb-95**	**I-131**	**Cs-134**	**Cs-137**
	3/9/2010	-1.75 ± 2.86	0.85 ± 2.05	-0.21 ± 0.30	0.29 ± 1.92	-1.73 ± 1.73
	6/8/2010	-1.79 ± 4.81	-0.71 ± 2.78	0.049 ± 0.33	1.21 ± 2.70	-0.51 ± 2.56
	9/14/2010	1.54 ± 4.14	-1.13 ± 2.23	-0.53 ± 0.33	-0.96 ± 2.74	-0.78 ± 2.30
	12/10/2010	-1.04 ± 5.52	-3.22 ± 3.37	-0.06 ± 0.27	-1.20 ± 3.44	-0.81 ± 3.52
		Ba-140	**La-140**	**H-3**	**K-40**	**Th-228**
	3/9/2010	4.68 ± 8.65	0.71 ± 2.57	-236 ± 600	109 ± 31.0	7.42 ± 3.97
	6/8/2010	-3.86 ± 19.4	-2.27 ± 5.96	1340 ± 931		
	9/14/2010	3.34 ± 11.2	-1.06 ± 3.37	5.45 ± 676		16.2 ± 8.59
	12/10/2010	-1.57 ± 15.1	0.33 ± 5.37	-127 ± 451		
		Mn-54	**Fe-59**	**Co-58**	**Co-60**	**Zn-65**
HIR	3/9/2010	0.03 ± 2.62	1.01 ± 5.85	-0.34 ± 2.80	-1.23 ± 2.71	-4.19 ± 6.16
	6/8/2010	-0.79 ± 1.50	-0.20 ± 3.43	0.06 ± 1.37	0.35 ± 1.58	-1.54 ± 2.73
	9/14/2010	1.18 ± 3.47	2.11 ± 6.28	-5.02 ± 3.60	-3.15 ± 3.34	4.10 ± 7.10
	12/10/2010	-1.12 ± 3.02	1.77 ± 6.62	-3.93 ± 3.16	-0.52 ± 3.11	-7.93 ± 7.25
		Zr-95	**Nb-95**	**I-131**	**Cs-134**	**Cs-137**
	3/9/2010	-0.39 ± 4.42	-0.67 ± 2.84	-0.16 ± 0.29	-1.33 ± 2.63	-3.45 ± 3.05
	6/8/2010	-1.57 ± 3.24	-0.19 ± 1.72	-0.07 ± 0.29	-0.86 ± 1.66	0.49 ± 1.73
	9/14/2010	-4.15 ± 5.85	3.71 ± 4.95	0.16 ± 0.46	3.04 ± 3.65	-0.80 ± 3.53
	12/10/2010	1.62 ± 6.08	1.71 ± 3.64	-0.25 ± 0.28	1.45 ± 3.81	3.42 ± 3.80
		Ba-140	**La-140**	**H-3**	**K-40**	
	3/9/2010	10.1 ± 14.1	-2.11 ± 3.99	-144 ± 605		
	6/8/2010	7.59 ± 13.6	0.02 ± 2.98	-497 ± 571	61.2 ± 57.7	
	9/14/2010	7.31 ± 15.9	2.24 ± 5.49	-555 ± 638		
	12/10/2010	2.77 ± 17.9	-2.77 ± 5.06	-101 ± 448		

TABLE 3-8: GAMMA EMITTER AND TRITIUM CONCENTRATIONS IN WELL WATER

Surry Power Station, Surry County, Virginia - 2010

pCi/Liter ± 2 Sigma

SAMPLING LOCATIONS	COLLECTION DATE	ISOTOPE				
		Mn-54	**Fe-59**	**Co-58**	**Co-60**	**Zn-65**
CS	03/09/2010	-0.34 ± 2.49	1.83 ± 5.10	-1.58 ± 2.39	-1.05 ± 2.24	0.95 ± 6.07
	06/08/2010	-2.29 ± 2.68	-5.09 ± 5.85	-2.14 ± 2.82	1.63 ± 2.54	1.55 ± 5.75
	09/14/2010	0.49 ± 3.38	4.04 ± 6.85	0.42 ± 3.30	-1.92 ± 3.81	-22.2 ± 10.5
	12/10/2010	0.81 ± 2.88	3.91 ± 5.13	-3.07 ± 2.57	0.27 ± 2.55	4.49 ± 5.86
		Zr-95	**Nb-95**	**I-131**	**Cs-134**	**Cs-137**
	03/09/2010	-3.96 ± 4.31	2.57 ± 2.90	0.40 ± 0.47	-0.37 ± 2.62	0.30 ± 2.66
	06/08/2010	-5.85 ± 5.06	-0.45 ± 3.63	0.02 ± 0.28	0.66 ± 2.48	-0.76 ± 2.80
	09/14/2010	-1.94 ± 6.29	0.29 ± 3.74	-0.40 ± 0.47	-0.91 ± 4.19	-0.31 ± 3.40
	12/10/2010	0.47 ± 4.68	2.18 ± 2.82	0.03 ± 0.25	-0.26 ± 3.01	0.01 ± 2.35
		Ba-140	**La-140**	**H-3**		
	03/09/2010	-2.18 ± 11.5	2.16 ± 3.94	-352 ± 598		
	06/08/2010	-10.2 ± 18.0	1.29 ± 5.98	-766 ± 555		
	09/14/2010	7.06 ± 16.8	-0.47 ± 5.94	-326 ± 656		
	12/10/2010	-1.79 ± 13.8	1.65 ± 3.79	412 ± 897		

TABLE 3-9: GAMMA EMITTER AND TRITIUM CONCENTRATIONS IN RIVER WATER

Surry Power Station, Surry County, Virginia - 2010

pCi/Liter ± 2 Sigma

SAMPLING LOCATIONS	COLLECTION DATE	Mn-54	Fe-59	Co-58	Co-60	Zn-65
SD	1/19/2010	-0.08 ± 1.93	0.96 ± 4.31	1.64 ± 2.10	2.23 ± 1.91	2.02 ± 4.01
	2/16/2010	1.22 ± 2.18	-1.51 ± 4.93	-2.54 ± 2.80	0.55 ± 2.80	4.48 ± 5.42
	3/9/2010	-1.39 ± 3.81	3.87 ± 6.71	-2.58 ± 2.93	-1.89 ± 3.14	-4.68 ± 8.18
	4/27/2010	-0.09 ± 1.06	0.12 ± 2.44	-0.58 ± 1.13	-0.82 ± 1.07	-4.84 ± 2.43
	5/27/2010	-0.18 ± 0.74	-0.74 ± 1.76	-0.77 ± 0.79	0.29 ± 0.68	0.20 ± 1.73
	6/15/2010	-1.75 ± 2.20	-1.48 ± 4.53	0.07 ± 2.28	-2.83 ± 2.29	-3.32 ± 4.67
	7/13/2010	-1.18 ± 3.62	-2.19 ± 7.61	-0.39 ± 3.24	-2.15 ± 3.99	9.44 ± 8.98
	8/17/2010	1.12 ± 2.74	-3.99 ± 5.89	-1.92 ± 2.75	-2.15 ± 2.47	-0.27 ± 6.36
	9/14/2010	1.28 ± 2.09	-1.47 ± 4.65	0.06 ± 2.11	-1.64 ± 2.35	-1.46 ± 4.71
	10/11/2010	0.70 ± 2.81	3.05 ± 6.44	-0.77 ± 3.04	1.28 ± 2.77	-5.34 ± 6.30
	11/9/2010	-0.16 ± 1.70	3.05 ± 4.84	-1.03 ± 2.60	0.00 ± 2.20	-7.04 ± 5.23
	12/14/2010	1.37 ± 3.04	-2.47 ± 7.76	0.37 ± 3.49	-1.23 ± 3.40	5.60 ± 7.51

SAMPLING LOCATIONS	COLLECTION DATE	Zr-95	Nb-95	I-131	Cs-134	Cs-137
SD	1/19/2010	-1.57 ± 3.69	1.03 ± 2.44	-1.65 ± 6.06	-0.13 ± 2.16	0.44 ± 2.08
	2/16/2010	1.84 ± 4.53	0.65 ± 2.51	-1.86 ± 5.92	2.69 ± 3.74	3.91 ± 2.66
	3/9/2010	3.22 ± 5.13	-0.42 ± 3.51	-0.43 ± 5.99	0.61 ± 3.41	-0.62 ± 3.72
	4/27/2010	-0.89 ± 2.02	-0.52 ± 1.25	-1.59 ± 4.11	0.27 ± 1.19	-1.43 ± 1.41
	5/27/2010	0.38 ± 1.37	0.05 ± 0.82	-1.04 ± 3.04	0.17 ± 0.79	0.23 ± 0.75
	6/15/2010	0.22 ± 3.88	-0.27 ± 2.45	4.58 ± 5.16	-0.29 ± 2.77	2.33 ± 2.62
	7/13/2010	3.20 ± 5.84	2.98 ± 4.01	-2.40 ± 5.12	-1.11 ± 4.23	-1.04 ± 4.27
	8/17/2010	-3.05 ± 4.79	-0.35 ± 3.06	0.57 ± 5.81	-0.03 ± 2.89	-1.17 ± 2.91
	9/14/2010	-1.41 ± 4.13	-0.14 ± 2.43	-1.52 ± 6.22	-1.09 ± 1.94	1.96 ± 2.12
	10/11/2010	-3.62 ± 4.91	-0.10 ± 2.95	-2.05 ± 5.89	-6.40 ± 3.01	-1.06 ± 3.15
	11/9/2010	-0.44 ± 3.80	-0.24 ± 2.28	-0.37 ± 4.05	1.04 ± 2.30	1.20 ± 2.26
	12/14/2010	-3.41 ± 5.93	0.78 ± 3.33	-0.57 ± 4.78	-6.36 ± 3.98	2.38 ± 3.69

SAMPLING LOCATIONS	COLLECTION DATE	Ba-140	La-140	H-3	K-40
SD	1/19/2010	-11.8 ± 14.0	0.12 ± 3.31		54.8 ± 50.8
	2/16/2010	-0.65 ± 14.6	0.52 ± 4.62		
	3/9/2010	1.84 ± 17.1	-1.91 ± 4.85	-1020 ± 480	
	4/27/2010	6.56 ± 8.86	0.74 ± 2.78		63.0 ± 26.1
	5/27/2010	4.19 ± 6.15	-1.20 ± 1.92		74.6 ± 18.6
	6/15/2010	1.40 ± 13.0	1.88 ± 4.11	1760 ± 1110	120 ± 62.9
	7/13/2010	5.20 ± 14.6	1.78 ± 4.43		83.7 ± 77.0
	8/17/2010	3.50 ± 14.3	0.33 ± 4.38		117 ± 70.2
	9/14/2010	6.37 ± 13.7	-0.08 ± 4.37	223 ± 413	151 ± 60.4
	10/11/2010	1.35 ± 15.0	4.42 ± 5.02		147 ± 63.2
	11/9/2010	-1.18 ± 10.7	-1.36 ± 3.03		108 ± 48.7
	12/14/2010	-0.97 ± 13.8	-0.49 ± 4.95	-126 ± 580	

TABLE 3-9: GAMMA EMITTER AND TRITIUM CONCENTRATIONS IN RIVER WATER

Surry Power Station, Surry County, Virginia - 2010

pCi/Liter ± 2 Sigma

SAMPLING LOCATIONS	COLLECTION DATE	ISOTOPES				
		Mn-54	**Fe-59**	**Co-58**	**Co-60**	**Zn-65**
SW-C	01/19/2010	0.18 ± 1.96	0.47 ± 4.17	-0.98 ± 2.11	0.75 ± 1.83	2.74 ± 4.49
	02/16/2010	0.94 ± 2.83	-0.60 ± 6.17	-0.91 ± 3.08	1.68 ± 3.06	-1.15 ± 5.68
	03/09/2010	-0.76 ± 2.59	-6.04 ± 5.62	-0.01 ± 2.83	-0.27 ± 2.81	-0.50 ± 5.92
	04/27/2010	0.07 ± 1.07	-1.92 ± 2.45	-0.34 ± 1.18	-0.43 ± 1.08	-5.07 ± 2.23
	05/25/2010	-0.34 ± 0.83	-0.28 ± 2.09	0.18 ± 0.96	-0.25 ± 0.78	-1.43 ± 1.63
	06/15/2010	-0.68 ± 3.02	-1.18 ± 5.02	-1.22 ± 2.99	0.41 ± 2.33	-0.22 ± 5.17
	07/13/2010	-0.83 ± 5.19	1.27 ± 8.41	1.10 ± 3.82	-1.43 ± 5.74	-8.55 ± 8.95
	08/17/2010	-0.08 ± 2.92	1.34 ± 6.64	0.18 ± 2.79	-1.86 ± 3.04	-4.87 ± 6.51
	09/14/2010	0.79 ± 2.00	2.05 ± 4.19	-0.76 ± 2.06	0.32 ± 1.98	-4.26 ± 4.68
	10/12/2010	-0.85 ± 2.48	-6.04 ± 5.90	0.37 ± 2.56	1.94 ± 2.75	0.62 ± 6.00
	11/09/2010	-0.27 ± 2.31	3.78 ± 4.47	-0.73 ± 2.19	1.27 ± 2.50	-1.56 ± 4.81
	12/14/2010	1.02 ± 3.41	-5.36 ± 6.94	-1.41 ± 3.26	2.68 ± 3.11	1.49 ± 7.47
		Zr-95	**Nb-95**	**I-131**	**Cs-134**	**Cs-137**
	01/19/2010	1.53 ± 3.63	2.51 ± 2.13	-0.97 ± 5.74	-1.44 ± 2.11	0.50 ± 2.21
	02/16/2010	0.92 ± 5.87	-1.76 ± 2.88	-3.58 ± 5.98	-5.49 ± 3.74	0.26 ± 3.08
	03/09/2010	-0.17 ± 4.94	2.17 ± 2.92	2.66 ± 4.74	-1.75 ± 2.78	-3.44 ± 3.06
	04/27/2010	-0.13 ± 2.11	-0.78 ± 1.21	0.62 ± 4.52	-0.32 ± 1.50	-0.30 ± 1.41
	05/25/2010	-1.29 ± 1.74	-0.48 ± 1.03	-0.95 ± 5.33	-0.68 ± 1.04	0.01 ± 0.85
	06/15/2010	4.91 ± 4.94	-3.82 ± 3.47	1.05 ± 5.54	-1.54 ± 3.33	-1.12 ± 3.03
	07/13/2010	-4.38 ± 6.37	4.59 ± 4.03	2.12 ± 5.83	3.79 ± 5.15	-2.07 ± 4.73
	08/17/2010	0.48 ± 4.59	-0.43 ± 2.95	2.05 ± 5.92	-5.98 ± 3.41	1.36 ± 3.16
	09/14/2010	-0.62 ± 3.76	-0.57 ± 2.14	-2.77 ± 5.96	-0.49 ± 1.81	-0.72 ± 2.22
	10/12/2010	-1.62 ± 4.40	0.65 ± 2.52	-0.66 ± 5.18	0.34 ± 2.60	0.60 ± 2.43
	11/09/2010	1.10 ± 4.60	0.63 ± 2.58	-0.82 ± 4.13	-0.96 ± 2.45	0.88 ± 2.82
	12/14/2010	3.05 ± 6.66	7.45 ± 4.03	0.43 ± 4.29	2.28 ± 3.35	1.90 ± 3.41
		Ba-140	**La-140**	**H-3**	**K-40**	**Th-228**
	01/19/2010	9.44 ± 13.2	-2.26 ± 3.61			5.67 ± 4.68
	02/16/2010	9.16 ± 16.1	-1.73 ± 4.95		109 ± 59.7	
	03/09/2010	3.99 ± 13.7	0.28 ± 4.37	-588 ± 500		
	04/27/2010	-2.62 ± 9.19	3.29 ± 3.13		36.8 ± 27.4	
	05/25/2010	1.29 ± 8.98	-0.27 ± 2.31		35.7 ± 23.4	
	06/15/2010	3.81 ± 13.4	0.57 ± 4.63	-572 ± 603	122 ± 66.5	10.30 ± 7.78
	07/13/2010	8.90 ± 16.2	0.81 ± 6.05		114 ± 83.8	
	08/17/2010	9.50 ± 16.4	-1.51 ± 4.12		246 ± 60.6	
	09/14/2010	-1.99 ± 14.7	-2.20 ± 3.75	144 ± 401	76.0 ± 50.4	
	10/12/2010	5.27 ± 14.1	-1.12 ± 4.37		139 ± 60.2	
	11/09/2010	-10.7 ± 10.9	-0.43 ± 3.58		72.0 ± 54.3	
	12/14/2010	-7.31 ± 14.3	1.98 ± 4.10	-89.0 ± 608		
		Ra-226				
	5/25/2010*	54.5 ± 51.6				

* Ra-226 was identified only in the May sample for 2010

TABLE 3-10: GAMMA EMITTER CONCENTRATIONS IN SILT

Surry Power Station, Surry County, Virginia - 2010

pCi/kg (dry) ± 2 Sigma

SAMPLING LOCATIONS	COLLECTION DATE	ISOTOPE				
		Cs-134	**Cs-137**	**K-40**	**Th-232**	**Th-228**
SD	04/06/2010	-4.06 ± 39.4	175 ± 47.9	13600 ± 1180	1000 ± 168	1140 ± 93.1
	09/08/2010	-0.74 ± 33.2	187 ± 64.1	14100 ± 1310	1090 ± 168	970 ± 109
		Ra-226				
	04/06/2010	2140 ± 1100				
	09/08/2010	1430 ± 1400				
		Cs-134	**Cs-137**	**K-40**	**Th-232**	**Th-228**
CHIC-C	04/06/2010	-5.81 ± 45.2	152 ± 62.9	14600 ± 1540	957 ± 217	1110 ± 146
	09/08/2010	9.76 ± 37.9	202 ± 67.4	16100 ± 1570	1020 ± 205	965 ± 148
		Ra-226	**Ac-228**			
	04/06/2010	3450 ± 1550				
	09/08/2010	2340 ± 1360	434 ± 353			

TABLE 3-11: GAMMA EMITTER CONCENTRATIONS IN SHORELINE SEDIMENT

Surry Power Station, Surry County, Virginia - 2010

pCi/kg (dry) ± 2 Sigma

SAMPLING LOCATIONS	COLLECTION DATE	ISOTOPE				
		Cs-134	**Cs-137**	**K-40**	**Th-228**	**Ra-226**
HIR	2/8/2010	3.49 ± 19.8	-15.7 ± 18.1	7070 ± 721	76.5 ± 42.6	608 ± 453
	8/17/2010	5.69 ± 26.4	-19.2 ± 27.7	9420 ± 833	882 ± 74.2	1250 ± 771
		Th-232	**Ac-228**			
	2/8/2010					
	8/17/2010	765 ± 141	249 ± 219			
		Cs-134	**Cs-137**	**K-40**	**Th-228**	**Ra-226**
CHIC-C	2/8/2010	-2.45 ± 25.2	-18.3 ± 26.6	2290 ± 621	1230 ± 81.5	1320 ± 854
	8/17/2010	0.57 ± 6.75	-4.95 ± 7.89	5730 ± 662	523 ± 511	750 ± 620
		Th-232				
	2/8/2010	1090 ± 104				
	8/17/2010	438 ± 84.5				

TABLE 3-12: GAMMA EMITTER CONCENTRATION IN FISH

Surry Power Station, Surry County, Virginia - 2010

pCi/kg (wet) ± 2 Sigma

SAMPLING LOCATION	COLLECTION DATE	SAMPLE TYPE	ISOTOPE			
			K-40	**Co-58**	**Co-60**	**Cs-134**
SD	04/07/2010	Catfish	692 ± 283	9.59 ± 12.3	6.65 ± 12.2	3.70 ± 14.1
	04/30/2010	White Perch	1170 ± 713	-4.67 ± 33.7	6.82 ± 24.7	-25.8 ± 29.2
	10/05/2010	Catfish	3290 ± 747	14.0 ± 29.5	-25.1 ± 34.1	-38.3 ± 32.1
	10/05/2010	White Perch	2980 ± 709	-16.7 ± 28.9	-16.2 ± 26.2	-4.28 ± 27.6
			Cs-137	**Fe-59**	**Mn-54**	**Zn-65**
	04/07/2010	Catfish	9.16 ± 12.4	-1.99 ± 31.3	6.26 ± 12.5	23.5 ± 28.3
	04/30/2010	White Perch	-0.24 ± 23.1	40.2 ± 80.4	28.8 ± 26.9	-42.8 ± 57.3
	10/05/2010	Catfish	26.7 ± 30.7	64.4 ± 61.7	10.7 ± 28.6	-99.1 ± 74.6
	10/05/2010	White Perch	-8.29 ± 23.4	-13.7 ± 62.5	19.9 ± 26.8	-4.94 ± 56.8

TABLE 3-13: GAMMA EMITTER CONCENTRATIONS IN OYSTERS

Surry Power Station, Surry County, Virginia - 2010

pCi/kg (wet) ± 2 Sigma

SAMPLING LOCATIONS	COLLECTION DATE	ISOTOPE			
		Co-58	**Co-60**	**Cs-134**	**Cs-137**
POS	04/06/2010	-0.47 ± 19.1	-6.1 ± 16.4	-4.22 ± 20.4	1.48 ± 19.7
	09/08/2010	2.86 ± 30.0	-15.7 ± 23.2	-4.40 ± 32.4	-11.4 ± 33.9
		Fe-59	**Mn-54**	**Zn-65**	**K-40**
	04/06/2010	3.82 ± 46.4	4.6 ± 18.5	-62.8 ± 46.8	
	09/08/2010	-9.85 ± 61.2	-13.5 ± 26.1	-25.5 ± 63.0	1150 ± 577
		Co-58	**Co-60**	**Cs-134**	**Cs-137**
MP	04/06/2010	-12.2 ± 25.2	5.69 ± 18.4	0.53 ± 25.3	11.1 ± 21.6
	09/08/2010	7.88 ± 28.2	30.0 ± 24.9	13.1 ± 27.8	17.1 ± 26.6
		Fe-59	**Mn-54**	**Zn-65**	**K-40**
	04/06/2010	27.1 ± 52.7	4.8 ± 21.3	11.3 ± 49.8	
	09/08/2010	-23.9 ± 63.3	-15.9 ± 27.6	-53.5 ± 59.9	622 ± 554

TABLE 3-14: GAMMA EMITTER CONCENTRATIONS IN CLAMS

Surry Power Station, Surry County, Virginia - 2010

pCi/kg (wet) ± 2 Sigma

SAMPLING LOCATIONS	COLLECTION DATE	ISOTOPE			
		Co-58	**Co-60**	**Cs-134**	**Cs-137**
JI	04/06/2010	-7.51 ± 23.3	20.20 ± 19.2	-48.40 ± 24.0	-13.10 ± 22.8
	09/08/2010	-8.65 ± 29.10	5.35 ± 22.10	-39.30 ± 26.60	-16.80 ± 26.4
		Fe-59	**Mn-54**	**Zn-65**	**Ra-226**
	04/06/2010	33.20 ± 53.8	2.77 ± 23.6	-15.00 ± 49.4	
	09/08/2010	13.70 ± 62.00	1.09 ± 20.60	-32.20 ± 59.30	931 ± 807
		Co-58	**Co-60**	**Cs-134**	**Cs-137**
SD	04/06/2010	-12.20 ± 20.0	-4.72 ± 19.5	-14.10 ± 19.9	12.80 ± 16.6
	09/08/2010	-17.50 ± 37.90	-6.56 ± 33.90	-7.81 ± 44.20	16.10 ± 34
		Fe-59	**Mn-54**	**Zn-65**	**K-40**
	04/06/2010	-43.90 ± 41.1	-8.90 ± 15.6	-2.54 ± 43.5	
	09/08/2010	-30.20 ± 78.50	-26.50 ± 33.80	19.00 ± 80.60	728 ± 615
		Co-58	**Co-60**	**Cs-134**	**Cs-137**
LC	04/06/2010	3.66 ± 28.8	18.40 ± 23.1	4.24 ± 24.6	-16.20 ± 25.2
	09/08/2010	-24.90 ± 32.90	-8.27 ± 27.20	-29.20 ± 27.80	-2.14 ± 27
		Fe-59	**Mn-54**	**Zn-65**	**Th-228**
	04/06/2010	9.74 ± 65.6	6.18 ± 24.3	44.20 ± 44.3	91.60 ± 50.7
	09/08/2010	-26.40 ± 60.90	0.20 ± 28.60	80.70 ± 84.40	70.90 ± 55
		Co-58	**Co-60**	**Cs-134**	**Cs-137**
CHIC-C	04/06/2010	3.50 ± 25.4	-29.60 ± 21.9	-4.37 ± 22.8	-9.12 ± 23.5
	09/08/2010	17.80 ± 26.00	0.04 ± 23.80	-18.80 ± 27.30	17.80 ± 26
		Fe-59	**Mn-54**	**Zn-65**	
	04/06/2010	-3.49 ±. 60.7	-14.50 ± 22.9	-46.60 ± 49.1	
	09/08/2010	-15.60 ± 64.60	-6.45 ± 22.70	-68.10 ± 45.90	

TABLE 3-15: GAMMA EMITTER CONCENTRATIONS IN CRABS

Surry Power Station, Surry County, Virginia - 2010

pCi/kg (wet) ± 2 Sigma

SAMPLING LOCATIONS	COLLECTION DATE	ISOTOPE			
		K-40	**Co-58**	**Co-60**	**Cs-134**
SD	06/08/2010	1680 ± 708	-40.6 ± 27.3	-3.15 ± 22.8	5.98 ± 26.8
		Cs-137	**Fe-59**	**Mn-54**	**Zn-65**
		-6.94 ± 28.8	4.34 ± 52.7	1.83 ± 25.1	1.74 ± 67.5

4. DISCUSSION OF RESULTS

Data from the radiological analyses of environmental media collected during 2010 and tabulated in Section 3, are discussed below. The procedures and specifications followed in the laboratory for these analyses are as required in the Teledyne Brown Engineering quality assurance manuals and laboratory procedures. In addition to internal quality control measures performed by the laboratories, 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 Program are provided in Appendix B.

The predominant radioactivity detected throughout 2010 was from external sources, such as fallout from nuclear weapons tests (cesium-137, strontium-90) and naturally occurring radionuclides. Naturally occurring nuclides such as beryllium-7, potassium-40, and thorium-228 were detected in numerous samples.

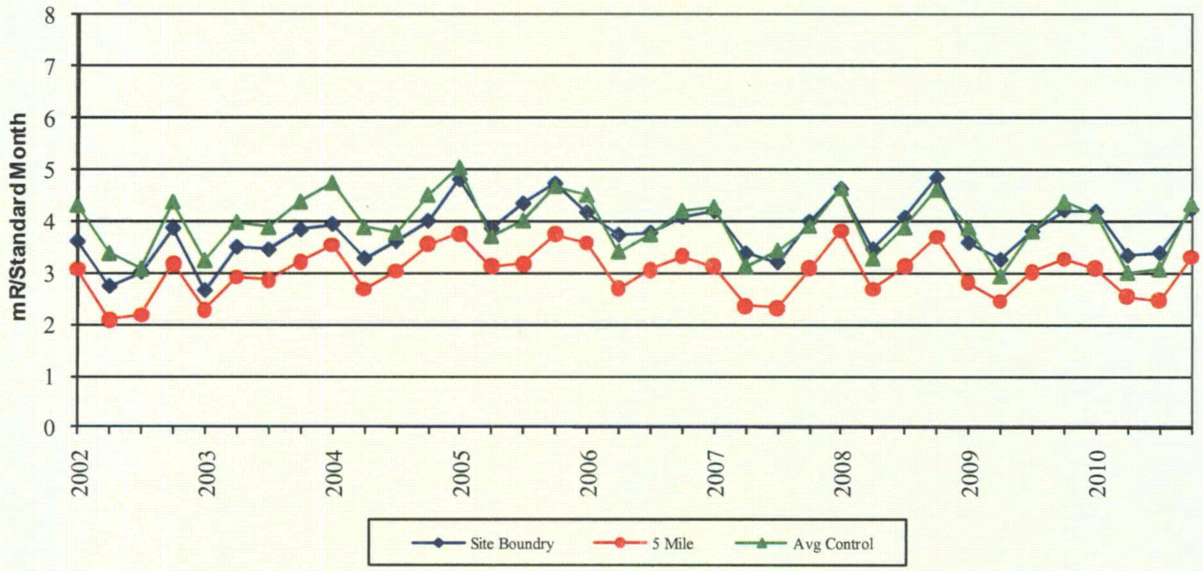
The following is a discussion and summary of the results of the environmental measurements taken during the 2010 reporting period.

4.1 Gamma Exposure Rate

A thermoluminescent dosimeter (TLD) is an inorganic crystal used to detect ambient radiation. Two TLDs, made of CaF and LiF elements and specifically designed for environmental monitoring, are deployed at each sampling location. TLDs are placed in two concentric rings around the station. The inner ring is located in the vicinity of 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 centers 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 TLD analyses are presented in Table 3-2. Figure 4-1 shows a historical trend of TLD exposure rate measurements, comparing the average of indicator TLDs located near the site boundary and at 5 miles to the average of all control TLD locations. Control and indicator averages indicate a steady relationship.

Figure 4-1: DIRECT RADIATION MEASUREMENT
TLD RESULTS



4.2 Airborne Gross Beta

Air is continuously sampled by passing it through glass fiber particulate filters. The filters collect airborne particulate radionuclides. Once a week the samples are collected and analyzed for gross beta activity. Results of the weekly gross beta analyses are presented in Table 3-3. A review of the results from control and indicator locations continues to show no significant variation in measured activities (see Figure 4-2 and 4-3). This indicates that any station contribution is not measurable.

Gross beta activity found during the pre-operational and early operating period of Surry 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.

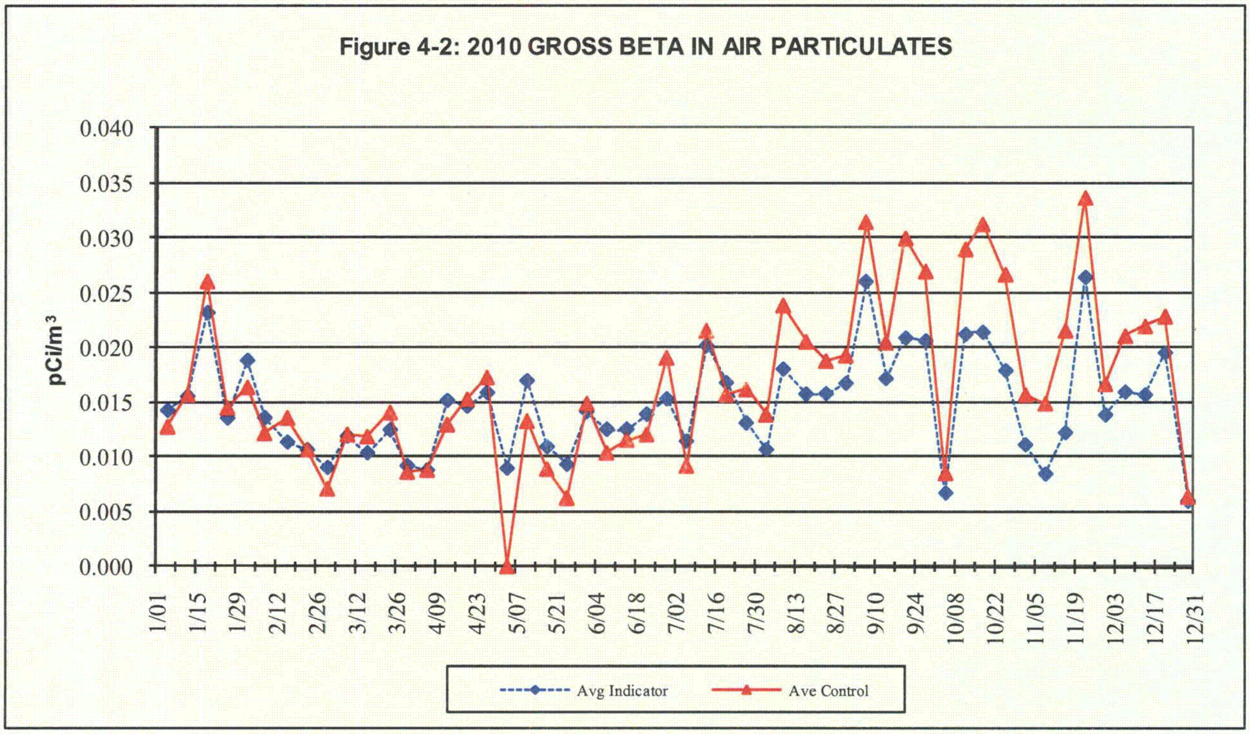


Figure 4-2: 2010 GROSS BETA IN AIR PARTICULATES
0.040
0.035
0.030
0.025
0.020
0.015
0.010
0.005
0.000
pCi/m³
1/01
1/15
1/29
2/12
2/26
3/12
3/26
4/09
4/23
5/07
5/21
6/04
6/18
7/02
7/16
7/30
8/13
8/27
9/10
9/24
10/08
10/22
11/05
11/19
12/03
12/17
12/31
Avg Indicator
Ave Control

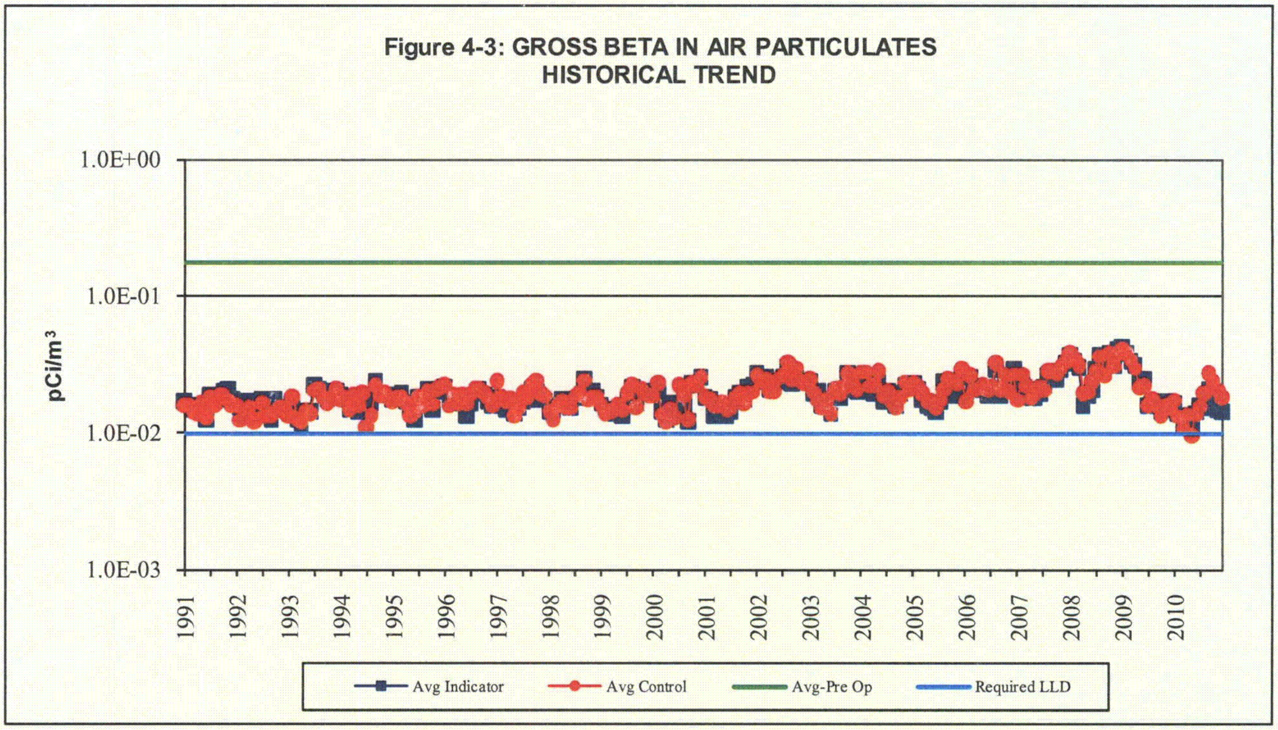


Figure 4-3: GROSS BETA IN AIR PARTICULATES
HISTORICAL TREND
1.0E+00
1.0E-01
1.0E-02
1.0E-03
pCi/m³
1991
1992
1993
1994
1995
1996
1997
1998
1999
2000
2001
2002
2003
2004
2005
2006
2007
2008
2009
2010
Avg Indicator
Avg Control
Avg-Pre Op
Required LLD

4.3 Airborne Radioiodine

Air is also continuously sampled for radioiodines by passing it through charcoal cartridges. Once a week the charcoal cartridge samples are collected and analyzed. The results of the analyses are presented in Table 3-4. All results are below the lower limit of detection. No positive iodine-131 was detected. 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 from the weekly gross beta analyses are composited by location and analyzed quarterly by gamma spectroscopy. The results are listed in Table 3-5. The results indicate the presence of naturally occurring beryllium-7, which is produced by cosmic processes. No man-made radionuclides were identified. These analyses confirm the lack of station effects.

4.5 Cow Milk

Analysis of milk samples is generally the most sensitive indicator of fission product existence in the terrestrial environment. This, in combination with the fact that consumption of milk is significant, results in this pathway usually being the most critical from the plant release viewpoint. 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 station effect.

Analysis results for cow milk are contained in Table 3-6. All results show a lack of detectable iodine-131 above the LLD of 1 pCi/L. Results of gamma spectroscopy indicate no other detectable station related radioactivity in the milk samples. In years past, cesium-137 has been detected sporadically. The occurrences were attributed to residual global fallout from past atmospheric weapons testing. Cs-137 was not detected at a level above the LLD in 2010.

At the request of the Commonwealth of Virginia, a quarterly composite sample is prepared from the monthly milk samples from the Colonial Parkway collection station. The composite samples are analyzed for strontium-89 and strontium-90. Sr-90 was detected in one of the four composites analyzed at a concentration of 1.26 pCi/L. The average Sr-90 concentration for the ten year period of 2001 to 2010 is 1.82 pCi/L. Sr-90 is not a component of the station radiological effluents. The Sr-90 detected is a product of nuclear weapons testing fallout which has been well documented.

4.6 *Food Products*

Three samples were collected and analyzed by gamma spectroscopy. The results of the analyses are presented in Table 3-7. As expected, naturally occurring potassium-40 was detected in all samples. The average concentration is consistent with that observed in previous years. Naturally occurring thorium-228 was also detected in one of three samples. No station related radioactivity was detected.

4.7 *Well Water*

Well water is not considered to be affected by station operations because there are no discharges made to this pathway. However, Surry Power Station monitors well water quarterly at three indicator locations and analyzes for gamma radiation and for tritium. The results of these analyses are presented in Table 3-8. Consistent with past monitoring, no station related radioactivity was detected. Naturally occurring potassium-40 and thorium-228 were detected in one sample each. No gamma emitting isotopes were detected during the pre-operational period.

4.8 *River Water*

Samples of the James River water are collected monthly and the results are presented in Table 3-9. All samples are analyzed by gamma spectroscopy. The monthly samples are also composited and analyzed for tritium on a quarterly basis. With the exception of natural products, no other gamma emitters were detected. Tritium was detected in one of eight samples at 1,760 pCi/liter. This concentration represents 5.9% of the 30,000 pCi/liter NRC reporting level concentration. The tritium was detected at the station discharge canal indicator sample location. The water in the discharge canal is further diluted by the river water beyond the discharge structure. No tritium or gamma emitting radionuclides were detected in the control river water samples. Naturally occurring potassium-40, thorium-228 and radium-226 were detected in some samples. No station related radioactivity was detected.

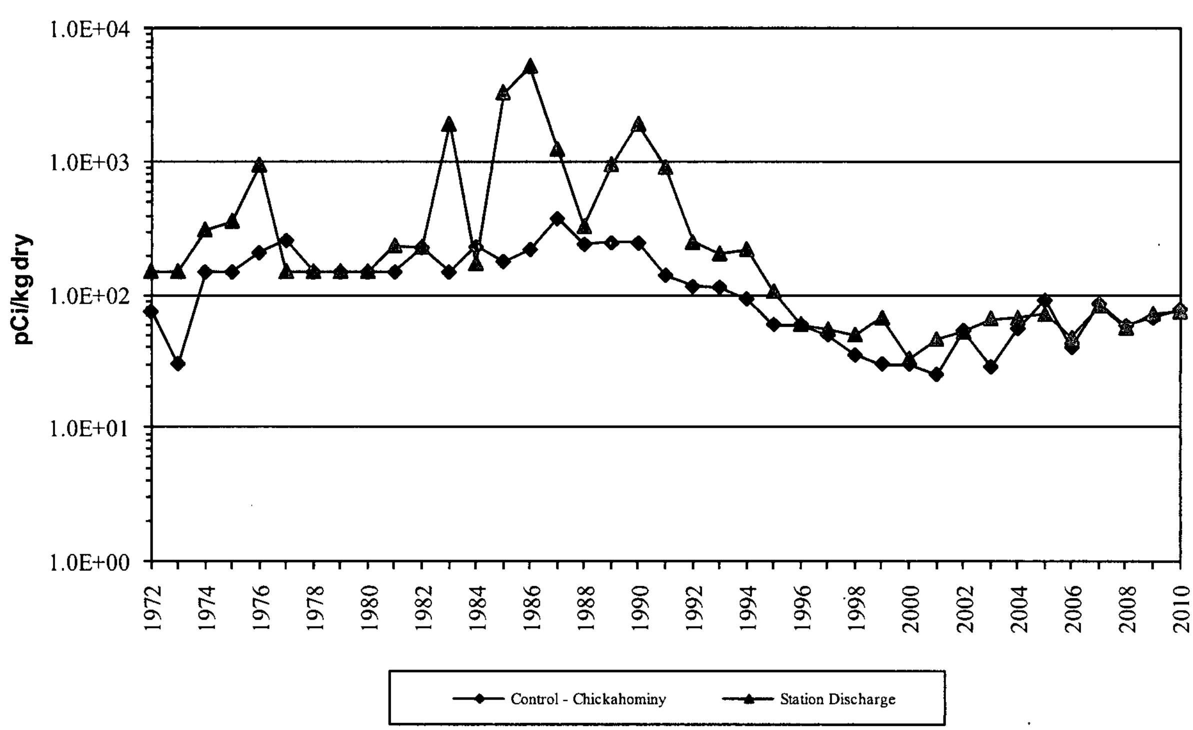
4.9 *Silt*

Silt is sampled to evaluate any buildup of radionuclides in the environment due to the operation of the station. Sampling of this pathway provides a good indication of the dispersion effects of effluents to the river. Buildup of radionuclides in silt could indirectly lead to increasing radioactivity levels in clams, oysters, crabs and fish.

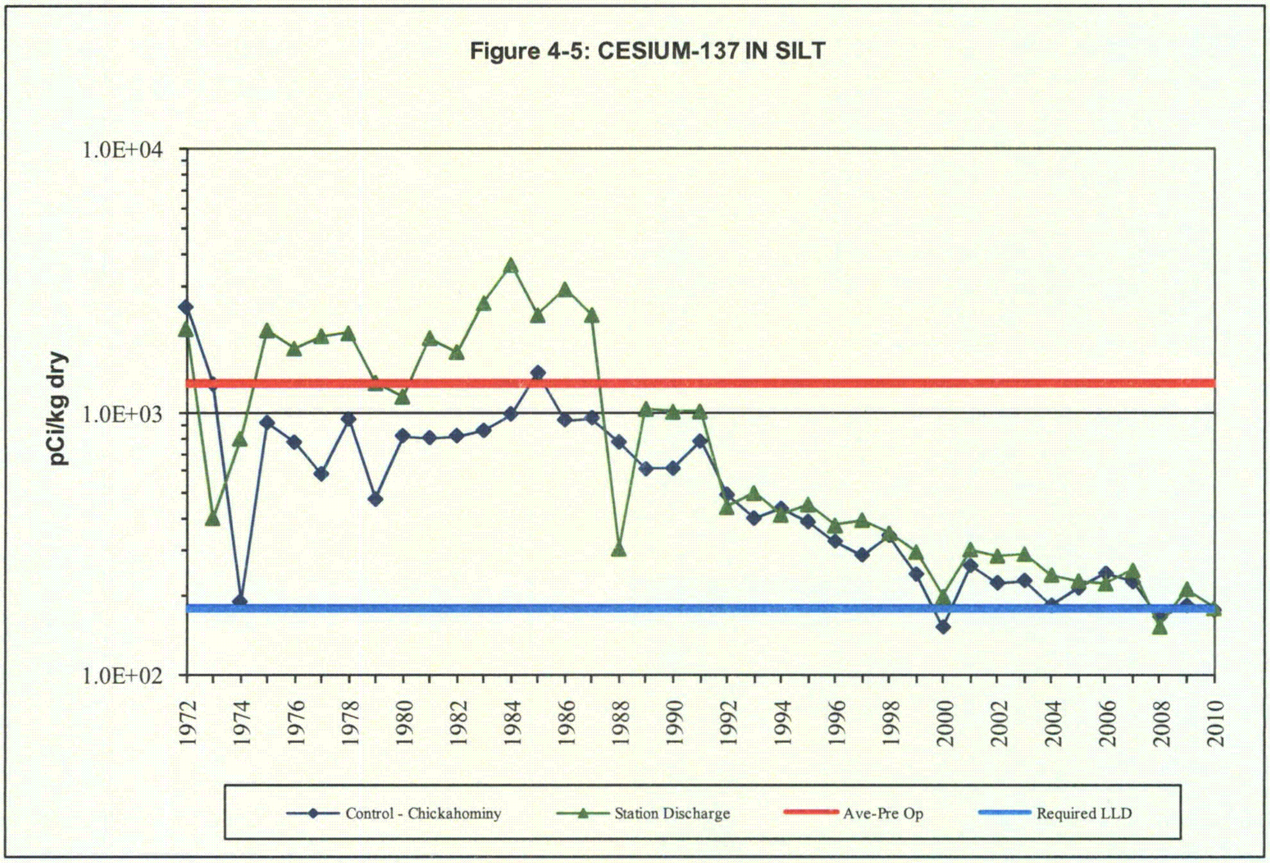
Samples of silt are collected from two locations, one upstream and one downstream of the station. The results of the gamma spectroscopy analyses are presented in Table 3-10. Historically, cobalt-60 has been detected in samples obtained from the indicator location (SD). Cobalt-60 has not been detected since 2003. Trend graphs of cobalt-60 and cesium-137 in silt appear in Figures 4-4 and 4-5.

Cesium-137 was detected, as expected, in both the control and indicator samples. The levels detected indicate a continual decreasing trend seen for over a decade. The detection of cesium-137 in both the control and indicator samples and decreasing levels indicate that the presence of cesium-137 is the result of accumulation and runoff into the river of residual weapons testing fallout. Its global presence has been well documented. During the pre-operational period, cesium-137 was detected in most silt samples with an average concentration as indicated in Figure 4-5. In 2010, cesium-137 was detected with an average indicator location concentration of 181 pCi/kg and an average control location concentration of 177 pCi/kg. These activities continue to represent fallout from nuclear weapons testing. Both indicator and control cesium-137 activities trend closely as shown in Figure 4-5.

Figure 4-4: COBALT-60 IN SILT



Chickahominy had detectable activity in 1982 and 1984 through 1994. Other years were <MDC, Minimum Detectable Concentration. Station Discharge was <MDC activity 1996 through 1998 and 2004 through 2010.



4.10 Shoreline Sediment

Shoreline sediment, unlike river silt, may provide a direct dose to humans. Buildup of radionuclides along the shoreline may provide a source of direct exposure for those using the area for commercial and recreational uses. The results are presented in Table 3-11.

The naturally occurring radionuclides potassium-40 and thorium-228 were detected at concentrations equivalent to normal background activities. The activities of these radionuclides indicate a steady trend. There were no radionuclides attributable to the operation of the station found in any shoreline sediment samples.

4.11 Fish

The radioactivity measured in fish sampled from the station discharge canal and analyzed by gamma spectroscopy is presented in Table 3-12. These results are the same as those seen over the last decade. No activity was observed in this media except for naturally occurring potassium-40.

4.12 Oysters

Oysters are collected from two different locations. The results of the oyster analyses are presented in Table 3-13.

There were no gamma emitting radionuclides detected in oysters sampled except for naturally occurring potassium-40. No station related radioactivity has been detected in this media since 1991. The absence of station related radionuclides is attributable to the replacement of steam generators in 1982 and past improvements made to liquid effluent treatment systems.

4.13 Clams

Clams are analyzed from four different locations. The results of the gamma spectroscopy analyses are presented in Table 3-14. Like oysters, no station related radioactivity was detected. Naturally occurring potassium-40, radium-226 and thorium-228 were detected.

4.14 Crabs

A crab sample was collected in June from the station discharge canal and analyzed by gamma spectroscopy. The results of the analysis are presented in Table 3-15. Other than naturally occurring potassium-40, no other gamma emitting radionuclides were detected in the sample. This is consistent with pre-operational data and data collected over the past decade.

5. PROGRAM EXCEPTIONS

There were no REMP exceptions for scheduled sampling and analysis during 2010.

During the March 2008 clam sampling campaign, clams were not found at the Hog Island Point sample location. An alternate sampling location, Jamestown Island, was selected and sampled throughout 2008. In 2010, clams continued to be sampled at the Jamestown Island location in place of the Hog Island Point location.

6. CONCLUSIONS

The results of the 2010 Radiological Environmental Monitoring Program for Surry Power Station have been presented in previous sections. This section presents conclusions for each pathway.

- **Direct Radiation Exposure Pathway** - Control and indicator location averages continue to indicate a steady relationship and trend over the long term.

- **Airborne Exposure Pathway** - Analysis of charcoal cartridge samples for radioiodines indicated no positive activity was detected. Quarterly gamma isotopic analyses of the composite particulate samples identified only naturally occurring beryllium-7. Air particulate gross beta concentrations at all of the indicator locations for 2010 trend well with the control location.

- **Milk** - Milk samples are an important indicator measuring the effect of radioactive iodine and radionuclides in airborne releases. Cesium-137 and iodine-131 were not detected in any of the thirty-six samples. Naturally occurring potassium-40 and thorium-228 were detected at a similar level when compared to the average of the previous year.

  Strontium-90 was detected in one of four samples this year at a concentration of 1.26 pCi/L. Strontium-90 is not a component of station effluents, but rather, a product of nuclear weapons testing fallout.

- **Food Products** - As expected, naturally occurring potassium-40 was detected in all three samples and naturally occurring thorium-228 was detected in one of three samples. In the past, cesium-137 has occasionally been detected in these samples and is attributable to global fallout from past nuclear weapons testing. Cesium-137 was not detected in any of the three samples collected in 2010.

- **Well Water** - Well water samples were analyzed and the analyses indicated that there were no man-made radionuclides present. This trend is consistent throughout the monitoring period. No radioactivity attributable to the operation of the station was identified.

- **River Water** - All river water samples were analyzed for gamma emitting radionuclides. The naturally occurring radionuclides potassium-40, thorium-228 and radium-226 were detected. Tritium was detected in one of eight samples with a concentration of 1,760 pCi/liter. This represents 5.9% of the NRC reporting level concentration. Because river water is not used for drinking water or for crop irrigation, there is a reduced dose consequence to the public from this pathway.

- **Silt** - Cesium-137 was detected in both the control and indicator samples. The presence of cesium-137 is attributable to residual weapons testing fallout; its presence has been well documented. Cobalt-60 has not been detected since 2003.

- **Shoreline Sediment** - Naturally occurring radionuclides were detected at concentrations equivalent to normal background activities. There were no radionuclides attributable to the operation of Surry Power Station found in any sample.

Aquatic Biota

- **Fish** - As expected, naturally occurring potassium-40 was detected. There were no other gamma emitting radionuclides detected in any of the fish samples.

- **Oysters and Clams** – Other than naturally occurring potassium-40, thorium-228 and radium-226, there were no other gamma emitting radionuclides detected in any of the oyster or clam samples.

- **Crabs** – Naturally occurring potassium-40 was detected. No other gamma emitting radionuclides were detected.

REFERENCES

References

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2. 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.

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

4. United States Nuclear Regulatory Commission Branch Technical Position, "Acceptable Radiological Environmental Monitoring Program", Rev. 1, November 1979.

5. Dominion, Station Administrative Procedure, VPAP-2103S, "Offsite Dose Calculation Manual (Surry)".

6. Virginia Electric and Power Company, Surry Power Station Technical Specifications, Units 1 and 2.

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

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

9. NCRP Report No. 160, "Ionizing Radiation Exposure of the Population of the United States," March 2010.

APPENDICES

APPENDIX A: LAND USE CENSUS

Year 2010

*LAND USE CENSUS**

Surry Power Station, Surry County, Virginia

January 1 to December 31, 2010 Page 1 of 1

Sector	Direction	Nearest Resident	Nearest Garden**	Nearest Cow	Nearest Goat
A	N	4.1 @ 10°	(a)	(a)	(a)
B	NNE	1.9 @ 32°	(a)	(a)	(a)
C	NE	4.7 @ 35°	(a)	(a)	(a)
D	ENE	(a)	(a)	(a)	(a)
E	E	(a)	(a)	(a)	(a)
F	ESE	(a)	(a)	(a)	(a)
G	SE	3.0 @ 143°	(a)	(a)	(a)
H	SSE	2.7 @ 158°	(a)	(a)	(a)
J	S	1.7 @ 181°	2.0 @ 183°	(a)	(a)
K	SSW	2.3 @ 212°	4.3 @ 193°	4.8 @ 200°	(a)
L	SW	2.3 @ 221°	3.6 @ 223°	(a)	(a)
M	WSW	0.4 @ 244°	3.6 @ 245°	(a)	(a)
N	W	3.1 @ 260°	3.4 @ 260°	(a)	(a)
P	WNW	4.9 @ 283°	(a)	(a)	(a)
Q	NW	4.6 @ 321°	(a)	(a)	(a)
R	NNW	3.8 @ 338°	4.4 @ 334°	3.7 @ 336°	(a)

* *Locations are listed by miles and degrees heading relative to true north from center of Unit #1 Containment.*
** *Area greater than 50 m^2 and contains broadleaf vegetation.*
(a) None

APPENDIX B: SUMMARY OF INTERLABORATORY COMPARISONS

Year 2010

INTRODUCTION

This appendix covers the Interlaboratory Comparison Program (ICP) of Teledyne Brown Engineering (TBE). TBE use QA/QC samples provided by Eckert & Ziegler Analytics, Inc., Environmental Resource Associates (ERA) and the Mixed Analyte Performance Evaluation Program (MAPEP) to monitor the quality of analytical processing associated with the REMP. Each provider has a documented Quality Assurance program and the capability to prepare Quality Control materials traceable to the National Institute of Standards and Technology (NIST). The providers supply the samples to TBE, and upon receipt, the laboratories perform the analyses in a normal manner. The results are then reported to the provider for evaluation. The suite of QA/QC samples is designed to provide sample media and radionuclide combinations that are offered by the providers and included in the REMP and typically includes:

- milk for gamma nuclides and low-level iodine-131 analyses,
- milk for Sr-89 and Sr-90 analyses,
- water for gamma nuclides, low-level iodine-131, and gross beta analyses,
- water for tritium, Sr-89, and Sr-90 analyses,
- cartridge for I-131 analyses,
- air filter for gamma nuclide, gross beta, and Sr-90 analyses.

The accuracy of each result reported to Eckert & Ziegler Analytics, Inc. is measured by the ratio of the TBE result to the known value. Accuracy for all other results is based on statistically derived acceptance ranges calculated by the providers. An investigation is undertaken whenever the ratio or reported result fell outside of the acceptance range.

RESULTS

The TBE ICP results are included in the following tables for the first through the fourth quarters of 2010. Two analyses did not meet the acceptance criteria. TBE initiated a non-conformance report, NCR 10-09, to document and address the analyses. The results of NCR 10-09 are as follows.

1. ERA Sample RAD-83 failed Zn-65 in water: Failure was due to a typo when entering the result into the ERA website. The reported result was entered as 11.0 pCi/L but should have been 111.0 pCi/L, which fell within the acceptance range of 91.8 – 122 pCi/L. In order to prevent recurrence of the typo, a very careful review of the entered results will be performed prior to submitting the results.
2. ERA Sample RAD-83 failed Sr-89 in water: The Sr-89 result of 77.8 pCi/L was evaluated as not acceptable based on the acceptance range of 55.8 – 76.7. The TBE to ERA ratio was 1.14 of the known value of 68.5. Since this

falls within 20% of the known value, TBE considers this an acceptable result. No corrective action is required.

ECKERT & ZIEGLER ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM
TELEDYNE BROWN ENGINEERING ENVIRONMENTAL SERVICES
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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	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	0.97	A
			Fe-59	pCi/L	146	137	1.06	A
			Zn-65	pCi/L	247	254	0.97	A
			Co-60	pCi/L	177	183	0.97	A
	E6981-396	Filter	Ce-141	pCi	211	185	1.14	A
			Cr-51	pCi	304	255	1.19	A
			Cs-134	pCi	142	125	1.13	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	96.8	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
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	126	0.91	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	0.97	A
	E7134-396	Charcoal	I-131	pCi	76.4	79.9	0.96	A

Footnotes are on page 3 of 3.

ECKERT & ZIEGLER ANALYTICS ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM
TELEDYNE BROWN ENGINEERING ENVIRONMENTAL SERVICES

Month/Year	Identification Number	Matrix	Nuclide	Units	Reported Value (a)	Known Value (b)	Ratio (c) TBE/Analytics	Evaluation (d)
June 2010	E7135-396	Filter	Ce-141	pCi	88.4	91.6	0.97	A
			Cr-51	pCi	292	282	1.04	A
			Cs-134	pCi	101	105	0.97	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
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	0.91	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	0.98	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	0.97	A
	E7231-396	Charcoal	I-131	pCi	62.3	59.9	1.04	A
	E7232-396	Filter	Ce-141	pCi	122	119	1.03	A
			Cr-51	pCi	228	214	1.07	A
			Cs-134	pCi	79.9	85.3	0.97	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
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

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ECKERT & ZIEGLER 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	E7376-396	Milk	I-131	pCi/L	87.9	96.9	0.91	A
			Cr-51	pCi/L	389	456	0.85	A
			Cs-134	pCi/L	137	157	0.91	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	0.98	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	0.97	A
	E7377-396	Charcoal	I-131	pCi	79.6	84.2	0.95	A
	E7378-396	Filter	Cr-51	pCi	387	365	1.06	A
			Cs-134	pCi	135	126	0.97	A
			Cs-137	pCi	157	149	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	1.21	W
			Zn-65	pCi	151	139	1.09	A
			Co-60	pCi	249	241	1.03	A

(a) Teledyne Brown Engineering reported result.
(b) The Eckert & Ziegler 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 Eckert & Ziegler Analytics results.
(d) Eckert & Ziegler 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. Two consecutive Warning evaluations require an investigation. 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	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
			H-3	Bq/L	104	90.8	63.6 - 118	A
			Mn-54	Bq/L	26.6	26.9	18.8 - 35.0	A
			Zn-65	Bq/L	42	40.7	28.5 - 52.9	A
			Am-241	Bq/L	1.25	1.30	0.91 - 1.69	A
	10-GrW22	Water	Gr-Alpha	Bq/L	0.5173	0.676	>0.0 - 1.352	A
			Gr-Beta	Bq/L	3.98	3.09	1.55 - 4.64	A
	10-RdF22	Filter	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-60	Bq/sample	2.65	2.473	1.731 - 3.215	A
			Mn-54	Bq/sample	3.7	3.02	2.11 - 3.93	W
			Sr-90	Bq/sample	0.0523			A (1)
	10-GrF22	Filter	Gr-Alpha	Bq/sample	0.1533	0.427	>0.0 - 0.854	A
			Gr-Beta	Bq/sample	1.240	1.29	0.65 - 1.94	A
August 2010	10-MaW23	Water	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
			Zn-65	Bq/L	30.8	31.0	21.7 - 40.3	A
			Sr-90	Bq/L	8.1	8.3	5.8 - 10.8	A
			Tc-99	Bq/L	36.4	33.6	23.5 - 43.7	A
	10-GrW23	Water	Gr-Alpha	Bq/L	2.38	1.92	0.58 - 3.26	A
			Gr-Beta	Bq/L	6.37	4.39	2.20 - 6.59	A
	10-RdF23	Filter	Cs-134	Bq/sample	2.31	2.98	2.09 - 3.87	W
			Am-241	Bq/sample	0.125	0.115	0.081 - 0.150	A
			Co-57	Bq/sample	3.64	4.08	2.86 - 5.30	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
			Sr-90	Bq/sample	1.01	1.01	0.71 - 1.31	A
	10-GrF23	Filter	Gr-Beta	Bq/sample	0.473	0.50	0.25 - 0.75	A

(1) False positive test
(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. Two consecutive Warning evaluations require an investigation. N = Not Acceptable

ERA ENVIRONMENTAL RADIOACTIVITY CROSS CHECK PROGRAM
TELEDYNE QC SPIKE 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)
April 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-Alpha	pCi/L	26.37	32.9	16.9 - 42.6	A
			Gr-Beta	pCi/L	28.77	37.5	24.7 - 45.0	A
			I-131	pCi/L	26.27	26.4	21.9 - 31.1	A
			H-3	pCi/L	12967	12400	10800 - 13600	A
October 2010	RAD 83	Water	Sr-89	pCi/L	77.8	68.5	55.8 - 76.7	NA(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	39.3	43.2	34.5 - 47.5	A
			Cs-137	pCi/L	117	123	111 - 138	A
			Co-60	pCi/L	53.50	53.4	48.1 - 61.3	A
			Zn-65	pCi/L	11	102	91.8 - 122	NA(2)
			Gr-Alpha	pCi/L	35.10	42.3	21.9 - 53.7	A
			Gr-Beta	pCi/L	35.5	36.6	24.0 - 44.2	A
			I-131	pCi/L	27.9	27.5	22.9 - 32.3	A
			H-3	pCi/L	13233	12900	11200 - 14200	A

(1) Sr-89 TBE to known ratio of 1.14 fell within acceptable range of ± 20%. No action required. NCR 10-09
(2) 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. Result falls within the Control Limits and outside of the Warning Limit.