COMMONWEALTH OF VIRGINIA
DEPARTMENT OF HEALTH

OFFICE OF RADIOLOGICAL HEALTH
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ENVIRONMENTAL RADIATION MONITORING PROGRAM

2019 ANNUAL REPORT

VDH VIRGINIA DEPARTMENT OF HEALTH
Protecting You and Your Environment

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Sampling Locations

Sampling Locations for Surry & North Anna Nuclear Power Station

Surry Power Station

North Anna Power Station

Air

SPS-A-1	Surry Power Station	Beta Air Filter Gamma Charcoal & Filter
SPS-A-2	Jamestown	Beta Air Filter Gamma Charcoal & Filter
PSP-A-1	Pocahontas State Park	Beta Air Filter Gamma Charcoal & Filter
NAPS-A-1	Louisa (Outside North Anna Power Station)	Beta Air Filter Gamma Charcoal & Filter
NAPS-A-2	Bumpass	Beta Air Filter Gamma Charcoal & Filter

Water

SPS-W-1	Surry Power Station Discharge Canal	Gamma, Tritium
SPS-W-2	James River @ Robious Landing	Gamma, Tritium
SPS-W-3	James River @ Scotland Wharf	Gamma, Tritium
NAPS-W-1	North Anna Power Station Discharge Canal	Gamma, Tritium
NAPS-W-2	North Anna River @ Rt 651	Gamma, Tritium
NAPS-W-3	North Anna River @ Rt. 522	Gamma, Tritium

Sample Analysis Results for Surry & North Anna Power Stations

WEEK	FREQUENCY	PAGE	COMMENTS
Week 1: 12/31/18– 01/07/19	Weekly	12	
Week 2: 01/07/19 – 01/14/19	Weekly	13	
Week 3: 01/14/19 – 01/21/19	Weekly	14	
Week 4: 01/21/19 – 01/28/19	Weekly	15	
Week 5: 01/28/19 – 02/04/19	Weekly	16	
Week 6: 02/04/19 – 02/11/19	Weekly	17	
Week 7: 02/11/19 – 02/18/19	Weekly	18	
Week 8: 02/18/19 – 02/25/19	Weekly	19	
Week 9: 02/25/19 – 03/04/19	Weekly	20	
Week 10: 03/04/19 – 03/11/19	Weekly	21	
Week 11: 03/11/19 – 03/18/19	Weekly	22	
Week 12: 03/18/19 - 03/25/19	Weekly	23	
Week 13: 03/25/19 – 04/01/19	Weekly	24	
Week 14: 04/01/19 – 04/08/19	Weekly	25	
Week 15: 04/08/19 – 04/15/19	Weekly	26	
Week 16: 04/15/19 – 04/22/19	Weekly	27	
Week 17: 04/22/19 – 04/29/19	Weekly	28	
Week 18: 04/29/19 – 05/06/19	Weekly	29	
Week 19: 05/06/19 – 05/13/19	Weekly	30	
Week 20: 05/13/19- 05/20/19	Weekly	31	
Week 21: 05/20/19 – 05/27/19	Weekly	32	
Week 22: 05/27/19 – 06/03/19	Weekly	33	
Week 23: 06/03/19 - 06/10/19	Weekly	34	
Week 24: 06/10/19 – 06/17/19	Weekly	35	
Week 25: 06/17/19 – 06/24/19	Weekly	36	
Week 26: 06/24/19 - 07/01/19	Weekly	37	
Week 27: 07/01/19 – 07/08/19	Weekly	38	
Week 28: 07/08/19– 07/15/19	Weekly	39	
Week 29: 07/15/19 – 07/22/19	Weekly	40	
Week 30: 07/22/19 – 07/29/19	Weekly	41	
Week 31: 07/29/19 – 08/05/19	Weekly	42	
Week 32: 08/05/19 – 08/12/19	Weekly	43	
Week 33: 08/12/19 – 08/19/19	Weekly	44	
Week 34: 08/19/19 – 08/26/19	Weekly	45	
Week 35: 08/26/19 – 09/02/19	Weekly	46	
Week 36: 09/02/19 – 09/09/19	Weekly	47	
Week 37: 09/09/19 – 09/16/19	Weekly	48	

Sample Analysis Results for Surry & North Anna Power Stations

WEEK	FREQUENCY	PAGE	COMMENTS
Week 38: 09/16/19 – 09/23/19	Weekly	49	
Week 39: 09/23/19 – 09/30/19	Weekly	50	
Week 40: 09/30/19 – 10/07/19	Weekly	51	
Week 41: 10/07/19 – 10/14/19	Weekly	52	
Week 42: 10/14/19 – 10/21/19	Weekly	53	
Week 43: 10/21/19 – 10/28/19	Weekly	54	
Week 44: 10/28/19 – 11/04/19	Weekly	55	
Week 45: 11/04/19 – 11/11/19	Weekly	56	
Week 46: 11/11/19 – 11/18/19	Weekly	57	
Week 47: 11/18/19 – 11/25/19	Weekly	58	
Week 48: 11/25/19 – 12/02/19	Weekly	59	
Week 49: 12/02/19 – 12/09/19	Weekly	60	
Week 50: 12/09/19 – 12/16/19	Weekly	61	
Week 51: 12/16/19 - 12/23/19	Weekly	62	
Week 52: 12/23/19 – 12/30/19	Weekly	63	

Other Sample Locations

SAMPLE	LOCATION	TYPE	FREQUENCY	PAGE
Surface Water				
NNSB-W-1	James River - NNSB-Pier 1	Surface Water	Quarterly	64
NNSB-W-2	James River - NNSB-Shipway 11	Surface Water	Quarterly	64
NNSY-W-1	Elizabeth River - NNSY - Drydock #4	Surface Water	Quarterly	65
NNSY-W-2	Elizabeth River - NNSY - Drydock #8	Surface Water	Quarterly	66
NNSY-W-3	Elizabeth River - NNSY - Wet Slip #1	Surface Water	Quarterly	67
Silt				
NNSB-S-1	James River - NNSB - Pier 1	Silt	Quarterly	68
NNSB-S-2	James River - NNSB-Shipway 11	Silt	Quarterly	69
NNSY-S-1	Elizabeth River - NNSY - Drydock #4	Silt	Quarterly	70
NNSY-S-2	Elizabeth River - NNSY - Drydock #8	Silt	Quarterly	71
NNSY-S-3	Elizabeth River - NNSY - Wet Slip #1	Silt	Quarterly	72

Other Sample Types for Surry & North Anna Power Stations

Sample	Location	Description	Frequency	Page
SILT				
SPS-S-1	James River – 1 ½ Mile Off Discharge Canal	Silt	2x per year	73
NAPS-S-1	Waste Treatment Shoreline Soil	Soil	2x per year	73
FISH				
NAPS-F-1	North Anna Lake – Second Cooling Lagoon	Edible Fish	2x per year	74-75
SPS-F-1	James River – .5 miles off Discharge Canal	Edible Fish	2x per year	74-75
SPS-R-1	James River- Various Locations	Shellfish	Annually	76
MILK				
SPS-M-1	Surry County-Epps Dairy	Raw	Quarterly	77-78
VEGETATION				
SPS-V-1	Surry County – Local Farmers	Edible Vegetation	2x per year	79
NAPS-V-1	Louisa County – Local Farmers	Edible Vegetation	2x per year	79

Dosimetry Locations for Surry & North Anna Power Stations

Dosimetry	Station	Frequency	Description	Page
Jamestown – Historical site	SPS-D-1	Quarterly	Gamma in Air	80-83
Williamsburg – Airport	SPS-D-2	Quarterly	Gamma in Air	80-83
Williamsburg – Busch Gardens	SPS-D-3	Quarterly	Gamma in Air	80-83
Newport News - Lee Hall	SPS-D-4	Quarterly	Gamma in Air	80-83
Naval Weapons Station – 1	SPS-D-5	Quarterly	Gamma in Air	80-83
Newport News – Fort Eustis	SPS-D-6	Quarterly	Gamma in Air	80-83
Surry – Route 628	SPS-D-7	Quarterly	Gamma in Air	80-83
Surry – Lawnes Creek	SPS-D-8	Quarterly	Gamma in Air	80-83
Surry Power Station	SPS-D-9	Quarterly	Gamma in Air	80-83
Surry – Hog Point	SPS-D-10	Quarterly	Gamma in Air	80-83
Surry – Bacon's Castle	SPS-D-11	Quarterly	Gamma in Air	80-83
Surry – Alliance	SPS-D-12	Quarterly	Gamma in Air	80-83
Surry – Scotland Wharf	SPS-D-13	Quarterly	Gamma in Air	80-83
Surry – Lebanon Baptist Church	SPS-D-14	Quarterly	Gamma in Air	80-83
Louisa County - Mineral	NAPS-D-1	Quarterly	Gamma in Air	80-83
Louisa County – Wares Crossroads	NAPS-D-2	Quarterly	Gamma in Air	80-83
Louisa County – Good Hope Church	NAPS-D-3	Quarterly	Gamma in Air	80-83
Spotsylvania – Route 713	NAPS-D-4	Quarterly	Gamma in Air	80-83
Spotsylvania Route 614	NAPS-D-5	Quarterly	Gamma in Air	80-83
Spotsylvania – Levy	NAPS-D-6	Quarterly	Gamma in Air	80-83
Louisa County – Bumpass Fire Dept.	NAPS-D-7	Quarterly	Gamma in Air	80-83
Louisa County – Fred Hall	NAPS-D-8	Quarterly	Gamma in Air	80-83
Louisa County – Aspen Hill	NAPS-D-9	Quarterly	Gamma in Air	80-83
Louisa County – Route 685	NAPS-D-10	Quarterly	Gamma in Air	80-83
Louisa County – Route 700	NAPS-D-11	Quarterly	Gamma in Air	80-83
North Anna Power Station	NAPS-D-12	Quarterly	Gamma in Air	80-83
Pocahontas State Park (Control)	PSP-D-1	Quarterly	Gamma in Air	80-83
Radiological Health	ORH-D-1	Quarterly	Gamma in Air	80-83
Radiological Health	ORH-D-2	Quarterly	Gamma in Air	80-83

Sampling Locations - Babcock & Wilcox

SAMPLE	LOCATION	TYPE	FREQUENCY	PAGE
AIR				
B&W-A-1	Eastern Site Boundary – Ballfield	Air Particulate	Quarterly	85
SOIL				
B&W-S-1	Eastern Site Boundary – Ballfield	Soil	Annually	86
B&W-S-2	James River Riverside Park	Soil	Annually	86
SURFACE WATER				
B&W-W-1	Eastern Site Boundary – Ballfield	Surface Water	Annually	86
B&W-W-2	James River Riverside Park	Surface Water	Annually	86
VEGETATION				
B&W-V-1	Eastern Site Boundary – Ballfield	Grass	Annually	87
B&W-V-2	James River Riverside Park	Grass	Annually	87

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NO DETECTABLE RESULTS "NDR"

In order for a nuclide to be identified in the spectrum and entered into this report, constraints set by the HPGe analysis software need to be satisfied and the results of the confidence index calculation must greater than the threshold (usually 0.3).
For the maximum confidence index, the following conditions need to be met.

- The nuclide energy peak needs to be within the energy tolerance of the library lines for that nuclide.
- A nuclide with multiple lines, must match the library peaks in the spectrum.
- The number of half-lives that has elapsed, between when the sample was taken and when it was counted, must be less than 10 half-lives or the confidence in the identification is small.

If the confidence index threshold and/or any of the three criteria are not met, then the nuclide is deemed no detectable results, (NDR).

MINIMUM DETECTABLE ACTIVITY "MDA"

MDA as used in this report is defined as the lowest level of radioactivity that can be consistently and accurately detected in a given sample that is identified in the spectrum.

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Analytical Results

Virginia Department of Health
Week 1: 12/31/18 – 01/07/19[1]

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				
SPS-A-2				
PSP-A-1				
NAPS-A-1				
NAPS-A-2				

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											
SPS-W-2											
SPS-W-3											
NAPS-W-1											
NAPS-W-2											
NAPS-W-3											

[1] Due to the holiday, 12/31, samples were not collected.

Virginia Department of Health
Week 2: 01/07/19 – 01/14/19[2]

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				0.02 +/- 0.003
SPS-A-2				0.03 +/- 0.005
PSP-A-1				0.03 +/- 0.004
NAPS-A-1				0.03 +/- 0.005
NAPS-A-2				0.03 +/- 0.004

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											150 +/- 71
SPS-W-2											NDR
SPS-W-3											NDR
NAPS-W-1											2628 +/- 254
NAPS-W-2											NDR
NAPS-W-3											NDR

[2] Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.

Virginia Department of Health
Week 3: 01/14/19 – 01/22/19[3]

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				
SPS-A-2				
PSP-A-1				
NAPS-A-1				
NAPS-A-2				

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											
SPS-W-2											
SPS-W-3											
NAPS-W-1											
NAPS-W-2											
NAPS-W-3											

[3] Due to the holiday 01/21, and MICL displayed at the EOC, samples collected for two weeks.

Virginia Department of Health
Week 4: 01/22/19– 01/28/19[4,5]

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				0.02 +/- 0.003
SPS-A-2				0.03 +/- 0.005
PSP-A-1				0.03 +/- 0.004
NAPS-A-1				0.03 +/- 0.004
NAPS-A-2				0.03 +/- 0.004

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	**H3 Activity**
SPS-W-1											1502 +/- 187
SPS-W-2											1051 +/- 158
SPS-W-3											1426 +/- 187
NAPS-W-1											5556 +/- 360
NAPS-W-2											751 +/- 141
NAPS-W-3											751 +/- 122

[4] Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.
[5] Due to Holiday 1/21 and MICL displayed at the EOC, samples were collected from 01/14 – 01/28.

Virginia Department of Health
Week 5: 01/28/19 – 02/04/19[6]

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				0.05 +/- 0.008
SPS-A-2				0.10 +/- 0.013
PSP-A-1				0.06 +/- 0.009
NAPS-A-1				0.07 +/- 0.010
NAPS-A-2				0.06 +/- 0.008

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 37	Ba 140	H3 Activity
SPS-W-1											150 +/- 71
SPS-W-2											NDR
SPS-W-3											NDR
NAPS-W-1											3003 +/- 273
NAPS-W-2											NDR
NAPS-W-3											NDR

[6] Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.

Virginia Department of Health
Week 6: 02/04/19 – 02/11/19[7]

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				0.04 +/- 0.006
SPS-A-2				0.07 +/- 0.009
PSP-A-1				0.05 +/- 0.007
NAPS-A-1				0.07 +/- 0.009
NAPS-A-2				0.07 +/- 0.009

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											1952 +/- 224
SPS-W-2											225 +/- 71
SPS-W-3											1201 +/- 174
NAPS-W-1											4054 +/- 317
NAPS-W-2											751 +/- 142
NAPS-W-3											300 +/- 100

[7] Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.

Virginia Department of Health
Week 7: 02/11/19 – 02/19/19[8, 9]

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				0.02 +/- 0.005
SPS-A-2				0.03 +/- 0.004
PSP-A-1				0.02 +/- 0.003
NAPS-A-1				0.03 +/- 0.004
NAPS-A-2				0.03 +/- 0.004

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 37	Ba 140	H3 Activity
SPS-W-1											NDR
SPS-W-2											NDR
SPS-W-3											NDR
NAPS-W-1[10]											21622 +/- 716
NAPS-W-2											300 +/- 71
NAPS-W-3											NDR

[8] Due to the holiday 02/18, samples were collected 02/19.
[9] Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.
[10] Due to Dominion Power Station release of the Boron Recovery Tank, Tritium level was elevated.

Virginia Department of Health
Week 8: 02/19/19 – 02/25/19[11]

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				0.03 +/- 0.004
SPS-A-2				0.03 +/- 0.005
PSP-A-1				0.03 +/- 0.005
NAPS-A-1				0.04 +/- 0.006
NAPS-A-2				0.03 +/- 0.005

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											901 +/- 142
SPS-W-2[12]											
SPS-W-3											901 +/- 142
NAPS-W-1											4129 +/- 309
NAPS-W-2[13]											
NAPS-W-3											976 +/- 142

[11] Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.
[12] Due to weather related high waters and safety, no sample could be collected.
[13] Due to weather related high waters, road closure and safety, no sample could be collected.

Virginia Department of Health
Week 9: 02/25/19 – 03/04/19 [14]

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				0.03 +/- 0.004
SPS-A-2				0.03 +/- 0.005
PSP-A-1				0.03 +/- 0.005
NAPS-A-1				0.05 +/- 0.007
NAPS-A-2				0.02 +/- 0.003

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											2477 +/- 246
SPS-W-2											NDR
SPS-W-3											300 +/- 71
NAPS-W-1											4054 +/- 310
NAPS-W-2[15]											
NAPS-W-3											375 +/- 100

[14] Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.
[15] Due to weather related high waters, road closure and safety, no sample could be collected.

Virginia Department of Health
Week 10: 03/04/19 – 03/11/19[16]

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				0.03 +/- 0.005
SPS-A-2				0.05 +/- 0.008
PSP-A-1				0.03 +/- 0.005
NAPS-A-1				0.05 +/- 0.006
NAPS-A-2				0.04 +/- 0.005

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											751 +/- 142
SPS-W-2											676 +/- 123
SPS-W-3											450 +/- 100
NAPS-W-1											4354 +/- 317
NAPS-W-2											225 +/- 71
NAPS-W-3											300 +/- 71

[16] Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.

Virginia Department of Health
Week 11: 03/11/19 – 03/18/19[17]

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				
SPS-A-2				
PSP-A-1				
NAPS-A-1				
NAPS-A-2				

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											
SPS-W-2											
SPS-W-3											
NAPS-W-1											
NAPS-W-2											
NAPS-W-3											

[17] Due to staff commitment at multiple Dominion Energy training drills, samples were not collected.

Virginia Department of Health
Week 12: 03/18/19 - 03/25/19[18]

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				
SPS-A-2				
PSP-A-1				
NAPS-A-1				
NAPS-A-2				

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											
SPS-W-2											
SPS-W-3											
NAPS-W-1											
NAPS-W-2											
NAPS-W-3											

[18] Due to staff commitment at multiple Dominion Energy training drills, samples were not collected.

Virginia Department of Health
Week 13: 03/25/19 – 04/01/19[19]

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				
SPS-A-2				
PSP-A-1				
NAPS-A-1				
NAPS-A-2				

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											
SPS-W-2											
SPS-W-3											
NAPS-W-1											
NAPS-W-2											
NAPS-W-3											

[19] Due to staff commitment at multiple Dominion Energy training drills, samples were not collected.

Virginia Department of Health
Week 14: 04/01/19 – 04/08/19[20]

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				
SPS-A-2				
PSP-A-1				
NAPS-A-1				
NAPS-A-2				

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											
SPS-W-2											
SPS-W-3											
NAPS-W-1											
NAPS-W-2											
NAPS-W-3											

[20] Due to staff commitment at multiple Dominion Energy training drills, samples were not collected.

Virginia Department of Health
Week 15: 04/08/19 – 04/15/19[21]

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				
SPS-A-2				
PSP-A-1				
NAPS-A-1				
NAPS-A-2				

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											
SPS-W-2											
SPS-W-3											
NAPS-W-1											
NAPS-W-2											
NAPS-W-3											

[21] Due to staff commitment at multiple Dominion Energy training drills, samples were not collected.

Virginia Department of Health
Week 16: 04/15/19 – 04/22/19[22, 23]

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				0.02 +/- 0.004
SPS-A-2				0.03 +/- 0.005
PSP-A-1				0.03 +/- 0.005
NAPS-A-1				0.03 +/- 0.005
NAPS-A-2				0.02 +/- 0.004

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											NDR
SPS-W-2											NDR
SPS-W-3											NDR
NAPS-W-1											3679 +/- 292
NAPS-W-2											NDR
NAPS-W-3											NDR

[22] Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.
[23] Due to a training exercise, air sample collection period was 6 days.

Virginia Department of Health
Week 17: 04/22/19 – 04/29/19[24]

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				0.02 +/- 0.004
SPS-A-2				0.04 +/- 0.005
PSP-A-1				0.07 +/- 0.010
NAPS-A-1[25]				
NAPS-A-2				0.02 +/- 0.004

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											375 +/- 100
SPS-W-2											225 +/- 71
SPS-W-3											225 +/- 71
NAPS-W-1											4955 +/- 340
NAPS-W-2											NDR
NAPS-W-3											NDR

[24] Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.
[25] Due to equipment malfunction, air sample was not collected.

Virginia Department of Health
Week 18: 04/29/19 – 05/06/19[26]

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				0.02 +/- 0.003
SPS-A-2				0.03 +/- 0.004
PSP-A-1				0.02 +/- 0.004
NAPS-A-1[27]				
NAPS-A-2				0.02 +/- 0.003

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											NDR
SPS-W-2											NDR
SPS-W-3											150 +/- 71
NAPS-W-1											3754 +/- 309
NAPS-W-2											NDR
NAPS-W-3											NDR

[26] Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.
[27] Due to equipment malfunction, air sample was not collected.

Virginia Department of Health
Week 19: 05/06/19 – 05/13/19[28]

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter³	Cs-134 Activity pCi/meter³	Cs-137 Activity pCi/meter³	Gross Beta Activity pCi/meter³
SPS-A-1				0.02 +/- 0.003
SPS-A-2				0.02 +/- 0.004
PSP-A-1				0.02 +/- 0.004
NAPS-A-1				0.02 +/- 0.003
NAPS-A-2				0.02 +/- 0.003

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											300 +/- 71
SPS-W-2											225 +/- 71
SPS-W-3											150 +/- 71
NAPS-W-1											5030 +/- 341
NAPS-W-2											150 +/- 71
NAPS-W-3											375 +/- 100

[28] Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.

Virginia Department of Health
Week 20: 05/13/19 - 05/20/19[29]

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				0.02 +/- 0.003
SPS-A-2				0.03 +/- 0.004
PSP-A-1				0.04 +/- 0.007
NAPS-A-1				0.03 +/- 0.004
NAPS-A-2				0.03 +/- 0.004

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											NDR
SPS-W-2											NDR
SPS-W-3											NDR
NAPS-W-1											2928 +/- 274
NAPS-W-2											NDR
NAPS-W-3											225 +/- 71

[29] Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.

Virginia Department of Health
Week 21: 05/20/19 – 05/27/19[30]

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				
SPS-A-2				
PSP-A-1				
NAPS-A-1				
NAPS-A-2				

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											
SPS-W-2											
SPS-W-3											
NAPS-W-1											
NAPS-W-2											
NAPS-W-3											

[30] Due to the holiday, 05/27, and competing office obligations, samples were not collected.

Virginia Department of Health
Week 22: 05/27/19 – 06/03/19[31]

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				
SPS-A-2				
PSP-A-1				
NAPS-A-1				
NAPS-A-2				

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											
SPS-W-2											
SPS-W-3											
NAPS-W-1											
NAPS-W-2											
NAPS-W-3											

[31] Due to competing office obligations, samples were not collected.

Virginia Department of Health
Week 23: 06/03/19 - 06/10/19[32, 33]

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				0.02 +/- 0.003
SPS-A-2				0.03 +/- 0.004
PSP-A-1				0.02 +/- 0.003
NAPS-A-1				0.03 +/- 0.003
NAPS-A-2				0.02 +/- 0.003

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											225 +/- 71
SPS-W-2											NDR
SPS-W-3											150 +/- 71
NAPS-W-1											2928 +/- 276
NAPS-W-2											NDR
NAPS-W-3											150 +/- 71

[32] Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.
[33] Due to CERC training, partnering FT training and preparation for the VOPEX, air samples collected for three weeks.

Virginia Department of Health
Week 24: 06/10/19 – 06/17/19[34]

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				
SPS-A-2				
PSP-A-1				
NAPS-A-1				
NAPS-A-2				

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											
SPS-W-2											
SPS-W-3											
NAPS-W-1											
NAPS-W-2											
NAPS-W-3											

[34] Due to training commitments related to VOPEX 2019, samples were not collected.

Virginia Department of Health
Week 25: 06/17/19 – 06/24/19[35]

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				
SPS-A-2				
PSP-A-1				
NAPS-A-1				
NAPS-A-2				

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											
SPS-W-2											
SPS-W-3											
NAPS-W-1											
NAPS-W-2											
NAPS-W-3											

[35] Due to VOPEX 2019 Dress Rehearsal and Field Team out-of-sequence demonstrations, samples were not collected.

Virginia Department of Health
Week 26: 06/24/19 - 07/01/19[36]

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				
SPS-A-2				
PSP-A-1				
NAPS-A-1				
NAPS-A-2				

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											
SPS-W-2											
SPS-W-3											
NAPS-W-1											
NAPS-W-2											
NAPS-W-3											

[36] Due to a scheduled Dominion training event, samples were not collected.

Virginia Department of Health
Week 27: 07/01/19 – 07/08/19[37]

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				
SPS-A-2				
PSP-A-1				
NAPS-A-1				
NAPS-A-2				

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											
SPS-W-2											
SPS-W-3											
NAPS-W-1											
NAPS-W-2											
NAPS-W-3											

[37] Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.

Virginia Department of Health
Week 28: 07/08/19 – 07/15/19

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				
SPS-A-2				
PSP-A-1				
NAPS-A-1				
NAPS-A-2				

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											
SPS-W-2											
SPS-W-3											
NAPS-W-1											
NAPS-W-2											
NAPS-W-3											

Virginia Department of Health
Week 29: 07/15/19 – 07/22/19

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				
SPS-A-2				
PSP-A-1				
NAPS-A-1				
NAPS-A-2				

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											
SPS-W-2											
SPS-W-3											
NAPS-W-1											
NAPS-W-2											
NAPS-W-3											

Virginia Department of Health
Week 30: 07/22/19 – 07/29/19

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				
SPS-A-2				
PSP-A-1				
NAPS-A-1				

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											
SPS-W-2											
SPS-W-3											
NAPS-W-1											
NAPS-W-2											
NAPS-W-3											

Virginia Department of Health
Week 31: 07/29/19 – 08/05/19

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				
SPS-A-2				
PSP-A-1				
NAPS-A-1				
NAPS-A-2				

Water

Site	Gamma and Tritium Activity – pCi/Liter										
SPS-W-1											
SPS-W-2											
SPS-W-3											
NAPS-W-1											
NAPS-W-2											
NAPS-W-3											

Virginia Department of Health
Week 32: 08/05/19 – 08/12/19

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				
SPS-A-2				
PSP-A-1				
NAPS-A-1				
NAPS-A-2				

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											
SPS-W-2											
SPS-W-3											
NAPS-W-1											
NAPS-W-2											
NAPS-W-3											

Virginia Department of Health
Week 33: 08/12/19 – 08/19/19

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				
SPS-A-2				
PSP-A-1				
NAPS-A-1				
NAPS-A-2				

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											
SPS-W-2											
SPS-W-3											
NAPS-W-1											
NAPS-W-2											
NAPS-W-3											

Virginia Department of Health
Week 34: 08/19/19 – 08/26/19

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				
SPS-A-2				
PSP-A-1				
NAPS-A-1				
NAPS-A-2				

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											
SPS-W-2											
SPS-W-3											
NAPS-W-1											
NAPS-W-2											
NAPS-W-3											

Virginia Department of Health
Week 35: 08/26/19 - 09/02/19

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				
SPS-A-2				
PSP-A-1				
NAPS-A-1				
NAPS-A-2				

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											
SPS-W-2											
SPS-W-3											
NAPS-W-1											
NAPS-W-2											
NAPS-W-3											

Virginia Department of Health
Week 36: 09/02/19 – 09/09/19

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				
SPS-A-2				
PSP-A-1				
NAPS-A-1				
NAPS-A-2				

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											
SPS-W-2											
SPS-W-3											
NAPS-W-1											
NAPS-W-2											
NAPS-W-3											

Virginia Department of Health
Week 37: 09/09/19 – 09/16/19

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				
SPS-A-2				
PSP-A-1				
NAPS-A-1				
NAPS-A-2				

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											
SPS-W-2											
SPS-W-3											
NAPS-W-1											
NAPS-W-2											
NAPS-W-3											

Virginia Department of Health
Week 38: 09/16/19 – 09/23/19

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1	NDR	NDR	NDR	0.03 +/- 0.004
SPS-A-2				
PSP-A-1				
NAPS-A-1				
NAPS-A-2				

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											
SPS-W-2											
SPS-W-3											
NAPS-W-1											
NAPS-W-2											
NAPS-W-3											

Virginia Department of Health
Week 39: 09/23/19 – 09/30/19

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				
SPS-A-2				
PSP-A-1				
NAPS-A-1				
NAPS-A-2				

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											
SPS-W-2											
SPS-W-3											
NAPS-W-1											
NAPS-W-2											
NAPS-W-3											

Virginia Department of Health
Week 40: 09/30/19 – 10/07/19

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				
SPS-A-2				
PSP-A-1				
NAPS-A-1				
NAPS-A-2				

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											
SPS-W-2											
SPS-W-3											
NAPS-W-1											
NAPS-W-2											
NAPS-W-3											

Virginia Department of Health
Week 41: 10/07/19 – 10/14/19

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				
SPS-A-2				
PSP-A-1				
NAPS-A-1				
NAPS-A-2				

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											
SPS-W-2											
SPS-W-3											
NAPS-W-1											
NAPS-W-2											
NAPS-W-3											

Virginia Department of Health
Week 42: 10/14/19 – 10/21/19

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				
SPS-A-2				
PSP-A-1				
NAPS-A-1				
NAPS-A-2				

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											
SPS-W-2											
SPS-W-3											
NAPS-W-1											
NAPS-W-2											
NAPS-W-3											

Virginia Department of Health
Week 43: 10/21/19 – 10/28/19

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				
SPS-A-2				
PSP-A-1				
NAPS-A-1				
NAPS-A-2				

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											
SPS-W-2											
SPS-W-3											
NAPS-W-1											
NAPS-W-2											
NAPS-W-3											

Virginia Department of Health
Week 44: 10/28/19 – 11/04/19

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				
SPS-A-2				
PSP-A-1				
NAPS-A-1				
NAPS-A-2				

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											
SPS-W-2											
SPS-W-3											
NAPS-W-1											
NAPS-W-2											
NAPS-W-3											

Virginia Department of Health
Week 45: 11/04/19 – 11/11/19

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				
SPS-A-2				
PSP-A-1				
NAPS-A-1				
NAPS-A-2				

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											
SPS-W-2											
SPS-W-3											
NAPS-W-1											
NAPS-W-2											
NAPS-W-3											

Virginia Department of Health
Week 46: 11/11/19 – 11/18/19

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				
SPS-A-2				
PSP-A-1				
NAPS-A-1				
NAPS-A-2				

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											
SPS-W-2											
SPS-W-3											
NAPS-W-1											
NAPS-W-2											
NAPS-W-3											

Virginia Department of Health
Week 47: 11/18/19 – 11/25/19

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				
SPS-A-2				
PSP-A-1				
NAPS-A-1				
NAPS-A-2				

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											
SPS-W-2											
SPS-W-3											
NAPS-W-1											
NAPS-W-2											
NAPS-W-3											

Virginia Department of Health
Week 48: 11/25/19 – 12/02/19

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				
SPS-A-2				
PSP-A-1				
NAPS-A-1				
NAPS-A-2				

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											
SPS-W-2											
SPS-W-3											
NAPS-W-1											
NAPS-W-2											
NAPS-W-3											

Virginia Department of Health
Week 49: 12/02/09 – 12/09/19

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				
SPS-A-2				
PSP-A-1				
NAPS-A-1				
NAPS-A-2				

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											
SPS-W-2											
SPS-W-3											
NAPS-W-1											
NAPS-W-2											
NAPS-W-3											

Virginia Department of Health
Week 50: 12/09/19 – 12/16/19

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				
SPS-A-2				
PSP-A-1				
NAPS-A-1				
NAPS-A-2				

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											
SPS-W-2											
SPS-W-3											
NAPS-W-1											
NAPS-W-2											
NAPS-W-3											

Virginia Department of Health
Week 51: 12/16/19 - 12/23/19

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				
SPS-A-2				
PSP-A-1				
NAPS-A-1				
NAPS-A-2				

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											
SPS-W-2											
SPS-W-3											
NAPS-W-1											
NAPS-W-2											
NAPS-W-3											

Virginia Department of Health
Week 52: 12/23/19 – 12/30/19

Air

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter^3	Cs-134 Activity pCi/meter^3	Cs-137 Activity pCi/meter^3	Gross Beta Activity pCi/meter^3
SPS-A-1				
SPS-A-2				
PSP-A-1				
NAPS-A-1				
NAPS-A-2				

Water

Site	Gamma and Tritium Activity – pCi/Liter										
	Mn 54	Co 58	Fe 59	Co 60	Zn 65	Zr 95	I 131	Cs 134	Cs 137	Ba 140	H3 Activity
SPS-W-1											
SPS-W-2											
SPS-W-3											
NAPS-W-1											
NAPS-W-2											
NAPS-W-3											

Virginia Department of Health
SURFACE WATER

January 1, 2019 through December 31, 2019

Newport News Shipbuilder
James River – Pier 1
NNSB-W-1

Qtr.	Date collected	Gamma Activity – pCi/liter						
		Ba-140	Cs-137	I-131	Mn-54	Zn-65	Zr95/Nb95	
1st	03/28/19[38]							
2nd	06/26/19[39]	<21.0	<5.0	<6.0	<5.0	<11.0	<9.0	126.5±14.2
3rd	09/26/18							
4th	11/29/18	NDR	NDR	NDR	NDR	NDR	NDR	N/A

James River – Shipway #11
NNSB-W-2

Qtr.	Date collected	Gamma Activity – pCi/liter						
		Ba-140	Cs-137	I-131	Mn-54	Zn-65	Zr95/Nb95	
1st	03/28/19[40]							
2nd	06/26/19[41]							
3rd								
4th								

[38] Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.
[39] Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.
[40] Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.
[41] Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.

Virginia Department of Health

SURFACE WATER

January 1, 2019 through December 31, 2019

Norfolk Naval Shipyard

Elizabeth River – Dry Dock #4
Norfolk Naval Shipyard NNSY-W-1

Qtr.	Date collected	Gamma Activity – pCi/liter					
	03/28/19[42]						
		Ba-140	Cs-137	I-131	Mn-54	Zn-65	Zr95/Nb95
1st							
	06/26/19[43]						
		Ba-140	Cs-137	I-131	Mn-54	Zn-65	Zr95/Nb95
2nd							
		Ba-140	Cs-137	I-131	Mn-54	Zn-65	Zr95/Nb95
3nd							
		Ba-140	Cs-137	I-131	Mn-54	Zn-65	Zr95/Nb95
4th							

[42] Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.
[43] Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.

Virginia Department of Health
SURFACE WATER

January 1, 2019 through December 31, 2019

Norfolk Naval Shipyard

Elizabeth River – Dry Dock #8
Norfolk Naval Shipyard NNSY-W-2

Qtr.	Date collected	Gamma Activity – pCi/liter					
	03/28/19[44]						
		Ba-140	Cs-137	I-131	Mn-54	Zn-65	Zr95/Nb95
1st							
	06/26/19[45]						
		Ba-140	Cs-137	I-131	Mn-54	Zn-65	Zr95/Nb95
2nd							
		Ba-140	Cs-137	I-131	Mn-54	Zn-65	Zr95/Nb95
3rd							
		Ba-140	Cs-137	I-131	Mn-54	Zn-65	Zr95/Nb95
4th							

[44] Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.
[45] Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.

Virginia Department of Health
SURFACE WATER

January 1, 2019 through December 31, 2019

Norfolk Naval Shipyard

Elizabeth River – Wet Slip #1
Norfolk Naval Shipyard NNSY-W-3

Qtr.	Date collected	Gamma Activity – pCi/liter					
	03/28/19[46]						
		Ba-140	Cs-137	I-131	Mn-54	Zn-65	Zr95/Nb95
1st							
	06/26/19[47]						
		Ba-140	Cs-137	I-131	Mn-54	Zn-65	Zr95/Nb95
2nd							
		Ba-140	Cs-137	I-131	Mn-54	Zn-65	Zr95/Nb95
3rd							
		Ba-140	Cs-137	I-131	Mn-54	Zn-65	Zr95/Nb95
4rd							

[46] Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.
[47] Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.

Virginia Department of Health
SILT

January 1, 2019 through December 31, 2019

Newport News Shipbuilder

Location	Date Collected	Gamma Activity pCi/gram			
James River – Pier 1 NNSB-S-1	03/28/19[48]	**Cs-134**	**Cs-137**	**Co-58**	**Co-60**
James River – Pier 1 NNSB-S-1	06/26/19[49]	**Cs-134**	**Cs-137**	**Co-58**	**Co-60**
James River – Pier 1 NNSB-S-1		**Cs-134**	**Cs-137**	**Co-58**	**Co-60**
James River – Pier 1 NNSB-S-1		**Cs-134**	**Cs-137**	**Co-58**	**Co-60**

[48] Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.
[49] Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.

Virginia Department of Health
SILT

January 1, 2019 through December 31, 2019

Newport News Shipbuilder

Location	Date Collected	Gamma Activity pCi/gram			
James River – Shipway 11 NNSB-S-2	03/29/19[50]	**Cs-134**	**Cs-137**	**Co-58**	**Co-60**
James River – Shipway 11 NNSB-S-2	06/26/19[51]	**Cs-134**	**Cs-137**	**Co-58**	**Co-60**
James River – Shipway 11 NNSB-S-2		**Cs-134**	**Cs-137**	**Co-58**	**Co-60**
James River – Shipway 11 NNSB-S-2		**Cs-134**	**Cs-137**	**Co-58**	**Co-60**

[50] Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.
[51] Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.

Virginia Department of Health
SILT

January 1, 2019 through December 31, 2019

Norfolk Naval Shipyard

Location	Date Collected	Gamma Activity pCi/gram			
Elizabeth River Drydock #4	03/28/19[52]				
NNSY-S-1	**Cs134**	**Cs137**	**Co58**	**Co60**	
Elizabeth River Drydock #4	06/26/19[53]				
NNSY-S-1	**Cs134**	**Cs137**	**Co58**	**Co60**	
Elizabeth River Drydock #4					
NNSY-S-1	**Cs134**	**Cs137**	**Co58**	**Co60**	
Elizabeth River Drydock #4					
NNSY-S-1	**Cs134**	**Cs137**	**Co58**	**Co60**	

[52] Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.
[53] Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.

Virginia Department of Health
SILT

January 1, 2019 through December 31, 2019

Norfolk Naval Shipyard

Location	Date Collected	Gamma Activity pCi/gram			
Elizabeth River Drydock #8	03/28/19[54]				
NNSY-S-2	**Cs134**	**Cs137**	**Co58**	**Co60**	
Elizabeth River Drydock #8	06/26/19[55]				
NNSY-S-2	**Cs134**	**Cs137**	**Co58**	**Co60**	
Elizabeth River Drydock #8					
NNSY-S-2	**Cs134**	**Cs137**	**Co58**	**Co60**	
Elizabeth River Drydock #8					
NNSY-S-2	**Cs134**	**Cs137**	**Co58**	**Co60**	

[54] Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.
[55] Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.

Virginia Department of Health
SILT

January 1, 2019 through December 31, 2019

Location	Date Collected	Gamma Activity pCi/gram			
Elizabeth River Wet Slip #1	03/28/19[56]				
NNSY-S-3	**Cs134**	**Cs137**	**Co58**	**Co60**	
Elizabeth River Drydock #8	06/26/19[57]				
NNSY-S-3	**Cs134**	**Cs137**	**Co58**	**Co60**	
Elizabeth River Drydock #8					
NNSY-S-3	**Cs134**	**Cs137**	**Co58**	**Co60**	
Elizabeth River Drydock #8					
NNSY-S-3	**Cs134**	**Cs137**	**Co58**	**Co60**	

[56] Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.
[57] Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.

Virginia Department of Health
SILT

January 1, 2019 through December 31, 2019

Surry Power Station
Discharge Canal, James River – SPS-S-1

Quarter	Date Collected	Gamma Activity pCi/gram			
		Cs-134	Cs-137	Co-58	Co-60
1st	03/28/19[58]				
		Cs-134	Cs-137	Co-58	Co-60
3rd					

North Anna Power Station
Waste Treatment NAPS-S-1

Quarter	Date Collected	Gamma Activity pCi/gram			
		Cs-134	Cs-137	Co-58	Co-60
2nd	06/26/19[59]				
		Cs-134	Cs-137	Co-58	Co-60
4th					

Note: Silt samples are collected bi-annually.

[58] Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.
[59] Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.

Virginia Department of Health
FISH

January 1, 2019 through December 31, 2019

Dominion Nuclear Power Station

Second Quarter

Location Type of fish	Date Collected	Isotope	pCi/gram
North Anna Cooling Lagoon	05/07/19	Ba-140	<0.05 pCi/g
		Cs-134	<0.01 pCi/g
		Cs-137	<0.01 pCi/g
		Co-58	<0.01 pCi/g
NAPS- F-1		Co-60	<0.01 pCi/g
(Fish)		I-131	<0.02 pCi/g
		Fe-59	<0.02 pCi/g
		Mn-54	<0.01 pCi/g
		Ru-106	<0.07 pCi/g
		Ag-110M	<0.01 pCi/g
		Zn-65	<0.02 pCi/g
		Nb-95	<0.02 pCi/g
Surry Discharge Canal	04/03/19	Ba-140	<0.06 pCi/g
		Cs-134	<0.01 pCi/g
		Cs-137	<0.01 pCi/g
		Co-58	<0.01 pCi/g
		Co-60	<0.01 pCi/g
SPS-F-1		I-131	<0.04 pCi/g
(Fish)		Fe-59	<0.01 pCi/g
		Mn-54	<0.01 pCi/g
		Ru-106	<0.03 pCi/g
		Ag-110M	<0.01 pCi/g
		Zn-65	<0.01 pCi/g
		Nb-95	<0.01 pCi/g

Note: Fish samples collected during the 2nd and 4th quarter.

Virginia Department of Health
FISH

January 1, 2019 through December 31, 2019

Dominion Nuclear Power Station

Fourth Quarter

Location Type of fish	Date Collected	Isotope	pCi/gram
North Anna Cooling Lagoon	05/07/19	Ba-140	<0.05 pCi/g
		Cs-134	
		Cs-137	<0.01 pCi/g
		Co-58	
NAPS- F-1		Co-60	<0.01 pCi/g
(Fish)		I-131	
		Fe-59	<0.02 pCi/g
		Mn-54	
		Ru-106	<0.07 pCi/g
		Ag-110M	
		Zn-65	<0.02 pCi/g
		Nb-95	
Surry Discharge Canal		Ba-140	
		Cs-134	<0.01 pCi/g
		Cs-137	
		Co-58	<0.01 pCi/g
		Co-60	
SPS-F-1		I-131	<0.04 pCi/g
(Fish)		Fe-59	
		Mn-54	<0.01 pCi/g
		Ru-106	
		Ag-110M	<0.01 pCi/g
		Zn-65	
		Nb-95	<0.01 pCi/g

Note: Fish samples collected during the 2nd and 4th quarter.

Virginia Department of Health
SHELLFISH

January 1, 2019 through December 31, 2019

Dominion Nuclear Power Station

Location Type of fish	Date Collected	Isotope	pCi/gram
Surry Power Station	03/13/19	Ba-140	<0.07 pCi/g
		Cs-134	<0.01 pCi/g
		Cs-137	<0.01 pCi/g
		Co-58	<0.01 pCi/g
		Co-60	<0.01 pCi/g
SPS-R-1		I-131	<0.07 pCi/g
(Clams and Oysters)		Fe-59	<0.01 pCi/g
		Mn-54	<0.01 pCi/g
		Ru-106	<0.03 pCi/g
		Ag-110M	<0.01 pCi/g
		Zn-65	<0.01 pCi/g
		Nb-95	<0.01 pCi/g

Note: Shellfish are collected annually when available.

Virginia Department of Health
Milk
January 1, 2019 through December 31, 2019

Surry County - Epps Dairy SPS-M-1 1st Quarter Date:01/04/19	
Isotope	**Results - pCi/liter**
Ba-140	< 13.0 pCi/L
Cs-134	< 3.0 pCi/L
Cs-137	< 4.0 pCi/L
K-40	1.6 +/- 0.1 g/L
I-131	< 4.0 pCi/L
Sr-89	< 4.0 pCi/L
Sr-90	< 0.45 pCi/L

Surry County - Epps Dairy SPS-M-1 2nd Quarter Date: 04/09/19	
Isotope	**Results - pCi/liter**
Ba-140	< 20.1 pCi/L
Cs-134	< 4.9 pCi/L
Cs-137	< 5.4 pCi/L
K-40	1.5 ± 0.1 g/L
I-131	< 5.7 pCi/L
Sr-89	< 4.0 pCi/L
Sr-90	<0.43 pCi/L

Surry County - Epps Dairy SPS-M-1 3rd Quarter Date:	
Isotope	**Results - pCi/liter**
Ba-140	
Cs-134	
Cs-137	
K-40	
I-131	
Sr-89	
Sr-90	

Virginia Department of Health

Milk

January 1, 2019 through December 31, 2019

Surry County - Epps Dairy SPS-M-1 4th Quarter Date:	
Isotope	**Results - pCi/liter**
Ba-140	
Cs-134	
Cs-137	
K-40*	
I-131	
Sr-89	
Sr-90	

Virginia Department of Health

VEGETATION

January 1, 2019 through December 31, 2019

Location	Date collected	Type	Isotope	Results pCi/Gram (wet weight)
Surry County **Private garden** **SPS-V-1**	2nd Quarter[61]	Mixed Greens	I-131 Cs-134 Cs-137	
Louisa County **Private Garden** **NAPS-V-1**	2nd Quarter[62]	Mixed Greens	I-131 Cs-134 Cs-137	
Surry County **Private garden** **SPS-V-1**		Mixed Greens	I-131 Cs-134 Cs-137	
Louisa County **Private Garden** **NAPS-V-1**		Mixed Greens	I-131 Cs-134 Cs-137	

Note: Vegetation is collected bi-annually when available.

[61] Due to the HPGE being inoperable, vegetation samples were not collected.
[62] Due to the HPGE being inoperable, vegetation samples were not collected.

Virginia Department of Health
AMBIENT GAMMA EXPOSURE
December 17, 2018 through March 25, 2019

FIRST QUARTER

Location	Station	Net Exposure Rate mR/Std Qtr +/- 2S.D.		
Jamestown – Historical site	SPS-D-1	**31.79**	**+/-**	**11.28**
Williamsburg – Airport	SPS-D-2	**26.62**	**+/-**	**10.32**
Williamsburg – Busch Gardens	SPS-D-3	**36.24**	**+/-**	**12.04**
Newport News - Lee Hall	SPS-D-4	**37.49**	**+/-**	**12.25**
Naval Weapons Station – 1	SPS-D-5	**24.36**	**+/-**	**9.87**
Newport News – Fort Eustis	SPS-D-6	**26.11**	**+/-**	**10.22**
Surry – Route 628	SPS-D-7	**22.35**	**+/-**	**9.46**
Surry – Lawnes Creek	SPS-D-8	**32.26**	**+/-**	**11.36**
Surry Power Station	SPS-D-9	**26.33**	**+/-**	**10.26**
Surry – Hog Point	SPS-D-10	**27.23**	**+/-**	**10.44**
Surry – Bacon's Castle	SPS-D-11	**24.38**	**+/-**	**9.88**
Surry – Alliance	SPS-D-12	**28.36**	**+/-**	**10.65**
Surry – Scotland Wharf	SPS-D-13	**25.38**	**+/-**	**10.08**
Surry – Lebanon Baptist Church	SPS-D-14	**24.32**	**+/-**	**9.86**
Louisa County - Mineral	NAPS-D-1	**29.10**	**+/-**	**10.79**
Louisa County – Wares Crossroads	NAPS-D-2	**26.71**	**+/-**	**10.34**
Spotsylvania – Good Hope Church	NAPS-D-3	**35.86**	**+/-**	**11.98**
Spotsylvania – Route 713	NAPS-D-4	**28.99**	**+/-**	**10.77**
Spotsylvania Route 614	NAPS-D-5	**28.55**	**+/-**	**10.69**
Spotsylvania – Levy	NAPS-D-6	**33.38**	**+/-**	**11.56**
Louisa County – Bumpass Fire Dept.	NAPS-D-7	**34.31**	**+/-**	**11.71**
Louisa County – Fred Hall	NAPS-D-8	**26.91**	**+/-**	**10.37**
Louisa County – Aspen Hill	NAPS-D-9	**39.55**	**+/-**	**12.58**
Louisa County – Route 685	NAPS-D-10	**28.07**	**+/-**	**10.60**
Louisa County – Route 700	NAPS-D-11	**35.26**	**+/-**	**11.88**
North Anna Power Station	NAPS-D-12	**33.84**	**+/-**	**11.63**
Pocahontas State Park (Control)	PSP-D-1	**47.04**	**+/-**	**13.72**
Radiological Health	ORH-D-1	**14.32**	**+/-**	**7.57**
Radiological Health	ORH-D-2	**16.37**	**+/-**	**8.09**

Virginia Department of Health
AMBIENT GAMMA EXPOSURE
March 25, 2019 through June 18, 2019

SECOND QUARTER

Location	Station	Net Exposure Rate mR/Std Qtr +/- 2S.D.		
Jamestown – Historical site	SPS-D-1	**18.44**	**+/-**	**8.59**
Williamsburg – Airport	SPS-D-2	**26.19**	**+/-**	**10.23**
Williamsburg – Busch Gardens	SPS-D-3	**28.48**	**+/-**	**10.67**
Newport News - Lee Hall	SPS-D-4	**35.86**	**+/-**	**11.98**
Naval Weapons Station – 1	SPS-D-5	**26.48**	**+/-**	**10.29**
Newport News – Fort Eustis	SPS-D-6	**26.91**	**+/-**	**10.37**
Surry – Route 628	SPS-D-7	**15.62**	**+/-**	**7.91**
Surry – Lawnes Creek	SPS-D-8	**24.79**	**+/-**	**9.96**
Surry Power Station	SPS-D-9	**24.79**	**+/-**	**9.96**
Surry – Hog Point	SPS-D-10	**22.35**	**+/-**	**9.46**
Surry – Bacon's Castle	SPS-D-11	**24.36**	**+/-**	**9.87**
Surry – Alliance	SPS-D-12	**21.94**	**+/-**	**9.87**
Surry – Scotland Wharf	SPS-D-13	**24.00**	**+/-**	**9.80**
Surry – Lebanon Baptist Church	SPS-D-14	**18.81**	**+/-**	**8.68**
Louisa County - Mineral	NAPS-D-1	**31.68**	**+/-**	**8.68**
Louisa County – Wares Crossroads	NAPS-D-2	**22.57**	**+/-**	**9.50**
Louisa County – Good Hope Church	NAPS-D-3	**22.74**	**+/-**	**10.53**
Spotsylvania – Route 713	NAPS-D-4	**25.19**	**+/-**	**10.04**
Spotsylvania Route 614	NAPS-D-5	**28.75**	**+/-**	**10.72**
Spotsylvania – Levy	NAPS-D-6	**29.59**	**+/-**	**10.88**
Louisa County – Bumpass Fire Dept.	NAPS-D-7	**28.70**	**+/-**	**10.71**
Louisa County – Fred Hall	NAPS-D-8	**23.94**	**+/-**	**9.79**
Louisa County – Aspen Hill	NAPS-D-9	**31.41**	**+/-**	**11.21**
Louisa County – Route 685	NAPS-D-10	**29.53**	**+/-**	**10.87**
Louisa County – Route 700	NAPS-D-11	**29.31**	**+/-**	**10.83**
North Anna Power Station	NAPS-D-12	**34.47**	**+/-**	**11.74**
Pocahontas State Park (Control)	PSP-D-1	**37.71**	**+/-**	**12.28**
Radiological Health	ORH-D-1	**13.49**	**+/-**	**7.35**
Radiological Health	ORH-D-2	**15.73**	**+/-**	**7.93**

Virginia Department of Health
AMBIENT GAMMA EXPOSURE

THIRD QUARTER

Location	Station	Net Exposure Rate mR/Std Qtr +/- 2S.D.
Jamestown – Historical site	SPS-D-1	**+/-**
Williamsburg – Airport	SPS-D-2	**+/-**
Williamsburg – Busch Gardens	SPS-D-3	**+/-**
Newport News - Lee Hall	SPS-D-4	**+/-**
Naval Weapons Station – 1	SPS-D-5	**+/-**
Newport News – Fort Eustis	SPS-D-6	**+/-**
Surry – Route 628	SPS-D-7	**+/-**
Surry – Lawnes Creek	SPS-D-8	**+/-**
Surry Power Station	SPS-D-9	**+/-**
Surry – Hog Point	SPS-D-10	**+/-**
Surry – Bacon's Castle	SPS-D-11	**+/-**
Surry – Alliance	SPS-D-12	**+/-**
Surry – Scotland Wharf	SPS-D-13	**+/-**
Surry – Lebanon Baptist Church	SPS-D-14	**+/-**
Louisa County - Mineral	NAPS-D-1	**+/-**
Louisa County – Wares Crossroads	NAPS-D-2	**+/-**
Louisa County – Good Hope Church	NAPS-D-3	**+/-**
Spotsylvania – Route 713	NAPS-D-4	**+/-**
Spotsylvania Route 614	NAPS-D-5	**+/-**
Spotsylvania – Levy	NAPS-D-6	**+/-**
Louisa County – Bumpass Fire Dept.	NAPS-D-7	**+/-**
Louisa County – Fred Hall	NAPS-D-8	**+/-**
Louisa County – Aspen Hill	NAPS-D-9	**+/-**
Louisa County – Route 685	NAPS-D-10	**+/-**
Louisa County – Route 700	NAPS-D-11	**+/-**
North Anna Power Station	NAPS-D-12	**+/-**
Pocahontas State Park (Control)	PSP-D-1	**+/-**
Radiological Health	ORH-D-1	**+/-**
Radiological Health	ORH-D-2	**+/-**

Virginia Department of Health
AMBIENT GAMMA EXPOSURE

FOURTH QUARTER

Location	Station	Net Exposure Rate mR/Std Qtr +/- 2S.D.
Jamestown – Historical site	SPS-D-1	**+/-**
Williamsburg – Airport	SPS-D-2	**+/-**
Williamsburg – Busch Gardens	SPS-D-3	**+/-**
Newport News - Lee Hall	SPS-D-4	**+/-**
Naval Weapons Station – 1	SPS-D-5	**+/-**
Newport News – Fort Eustis	SPS-D-6	**+/-**
Surry – Route 628	SPS-D-7	**+/-**
Surry – Lawnes Creek	SPS-D-8	**+/-**
Surry Power Station	SPS-D-9	**+/-**
Surry – Hog Point	SPS-D-10	**+/-**
Surry – Bacon's Castle	SPS-D-11	**+/-**
Surry – Alliance	SPS-D-12	**+/-**
Surry – Scotland Wharf	SPS-D-13	**+/-**
Surry – Lebanon Baptist Church	SPS-D-14	**+/-**
Louisa County - Mineral	NAPS-D-1	**+/-**
Louisa County – Wares Crossroads	NAPS-D-2	**+/-**
Louisa County – Good Hope Church	NAPS-D-3	**+/-**
Spotsylvania – Route 713	NAPS-D-4	**+/-**
Spotsylvania Route 614	NAPS-D-5	**+/-**
Spotsylvania – Levy	NAPS-D-6	**+/-**
Louisa County – Bumpass Fire Dept.	NAPS-D-7	**+/-**
Louisa County – Fred Hall	NAPS-D-8	**+/-**
Louisa County – Aspen Hill	NAPS-D-9	**+/-**
Louisa County – Route 685	NAPS-D-10	**+/-**
Louisa County – Route 700	NAPS-D-11	**+/-**
North Anna Power Station	NAPS-D-12	**+/-**
Pocahontas State Park (Control)	PSP-D-1	**+/-**
Radiological Health	ORH-D-1	**+/-**
Radiological Health	ORH-D-2	**+/-**

COMMONWEALTH OF VIRGINIA

DEPARTMENT OF HEALTH

OFFICE OF RADIOLOGICAL HEALTH
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BABCOCK & WILCOX

Virginia Department of Health

AIR PARTICULATE COMPOSITE SAMPLES

January 1, 2019 through December 31, 2019

Eastern Site Boundary – Ball field

FIRST QUARTER REPORT

	Start	Date	Stop	Gross Alpha Activity pCi/meter^3
B&W-A-1				
1st	01/09/2019	-	01/15/2019	0.001

SECOND QUARTER REPORT

	Start	Date	Stop	Gross Alpha Activity pCi/meter^3
B&W-A-1				
2nd	04/03/2019	-	04/09/2019	0.001

THIRD QUARTER REPORT

	Start	Date	Stop	Gross Alpha Activity pCi/meter^3
B&W-A-1				
3rd				

FOURTH QUARTER REPORT

	Start	Date	Stop	Gross Alpha Activity pCi/meter^3
B&W-A-1				
4th				

Virginia Department of Health

SOIL

January 1, 2019 through December 31, 2019

Location	Date	Distance & Direction	Type	Alpha Activity ppm
Eastern Site Boundary Ball field B&W-S-1		Site Boundary	Soil	<
James River Shoreline Near Six Mile Bridge "control" B&W-S-2		1.5 miles SW	Soil	<

Soil samples collected annually.
Note: Uranium separation followed by alpha counting.

SURFACE WATER

January 1, 2019 through December 31, 2019

Location	Date	Distance & Direction	Alpha Activity ppb
James River Shoreline Near Ball field at eastern site boundary B&W-W-1		Approx. 3 miles downstream	<
James River Shoreline Near Six Mile Bridge "control" B&W-W-2		Approx. 1.5 miles upstream	<

Surface water samples collected annually.
Note: Uranium separation followed by alpha counting.

Virginia Department of Health
VEGETATION

January 1, 2019 through June 30, 2019

Eastern Site Boundary / James River Shoreline

Location	Date	Distance & Direction	Alpha Activity ppm
Eastern site boundary Ball field B&W-V-1		Approx. 3 miles downstream	<
James River Shoreline off Rt. 460 "control" B&W-V-2		Approx. 4.5 Miles SW	<

Vegetation collected annually.
Note: Uranium separation followed by alpha counting.

COMMONWEALTH OF VIRGINIA
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EMERGENCY PREPAREDNESS

EMERGENCY PREPAREDNESS

The Office of Radiological Health (ORH) located within the Virginia Department of Health (VDH) is one of the lead response agencies for emergencies involving the potential or actual release of radioactive materials. Overall, state level emergency response is described in the Commonwealth of Virginia Radiological Emergency Response Plan (COVRERP), which is developed and maintained by the Virginia Department of Emergency Management (VDEM). In addition to generic guidelines for responding to any major radiological emergency, the response procedures contain segments addressing response to several specific types of radiological incidents. This includes sections which provide information needed for response to Licensee and Transportation accidents. Other sections contain background information and response guidance for accidents at fixed nuclear facilities. Plans are also being developed to respond to possible radiological terrorist attacks, which may include detonation of a radiological dispersion device (RDD aka “dirty bomb”), an improvised nuclear device (IND), or a military grade nuclear warhead.

When responding to any radiological emergency, the primary tasks of the Office of Radiological Health are to locate, identify, and predict the impact of any radioactive materials released to the environment. Based on the predicted or known impact, ORH then recommends appropriate measures to protect the public. ORH would also be tasked with helping to supervise the cleanup of radiological contamination and ensuring the proper disposal of radioactive waste. An ORH duty officer maintains 24-hour coverage to provide initial assessment/assistance for local responders and may also initiate the mobilization/deployment of other trained staff to respond to a radiological emergency when needed.

Under the provisions of current Federal Emergency Management Agency (FEMA) regulations, ORH conducts or participates in periodic drills that are designed to provide team training and to test emergency plans and procedures. The scope of these drills ranges from receiving and acknowledging simulated emergency communications to full-scale team deployment.

Federal regulations for commercial nuclear power generating facilities stipulate that a full-scale exercise involving appropriate local government participation and testing all significant response elements must be conducted and evaluated every other year. Because there are two such facilities, Surry and North Anna Nuclear Power Stations, Commonwealth of Virginia agencies will perform exercise activities on a yearly basis, alternating between the sites each year.