

COMMONWEALTH OF VIRGINIA  
DEPARTMENT OF HEALTH

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OFFICE OF RADIOLOGICAL HEALTH  
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**ENVIRONMENTAL  
RADIATION  
MONITORING  
PROGRAM**

**2019  
Fourth Quarter Report**

COMMONWEALTH OF VIRGINIA  
DEPARTMENT OF HEALTH

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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

<b>WEEK</b>	<b>FREQUENCY</b>	<b>PAGE</b>	<b>COMMENTS</b>
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
<b><u>Surface Water</u></b>				
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
<b><u>Silt</u></b>				
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
<b>SILT</b>				
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
<b>FISH</b>				
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
<b>MILK</b>				
SPS-M-1	Surry County-Epps Dairy	Raw	Quarterly	77-78
<b>VEGETATION</b>				
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

<b>Dosimetry</b>	<b>Station</b>	<b>Frequency</b>	<b>Description</b>	<b>Page</b>
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

<b>SAMPLE</b>	<b>LOCATION</b>	<b>TYPE</b>	<b>FREQUENCY</b>	<b>PAGE</b>
<b><u>AIR</u></b>				
B&W-A-1	Eastern Site Boundary - Ballfield	Air Particulate	Quarterly	85
<b><u>SOIL</u></b>				
B&W-S-1	Eastern Site Boundary - Ballfield	Soil	Annually	86
B&W-S-2	James River Riverside Park	Soil	Annually	86
<b><u>SURFACE WATER</u></b>				
B&W-W-1	Eastern Site Boundary - Ballfield	Surface Water	Annually	86
B&W-W-2	James River Riverside Park	Surface Water	Annually	86
<b><u>VEGETATION</u></b>				
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 be 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<sup>1</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
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											

<sup>1</sup> Due to the holiday, 12/31, samples were not collected.

**Virginia Department of Health**  
**Week 2: 01/07/19 – 01/14/19<sup>2</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
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

<sup>2</sup> 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<sup>3</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
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											

<sup>3</sup> 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<sup>4,5</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
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

<sup>4</sup> Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.

<sup>5</sup> 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<sup>6</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
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

<sup>6</sup> 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<sup>7</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
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

<sup>7</sup> 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<sup>8, 9</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
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 <sup>10</sup>											21622 +/- 716
NAPS-W-2											300 +/- 71
NAPS-W-3											NDR

<sup>8</sup> Due to the holiday 02/18, samples were collected 02/19.

<sup>9</sup> Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.

<sup>10</sup> 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<sup>11</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
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 <sup>12</sup>												
SPS-W-3												901 +/- 142
NAPS-W-1												4129 +/- 309
NAPS-W-2 <sup>13</sup>												
NAPS-W-3												976 +/- 142

<sup>11</sup> Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.

<sup>12</sup> Due to weather related high waters and safety, no sample could be collected.

<sup>13</sup> 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**<sup>14</sup>

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
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 <sup>15</sup>											
NAPS-W-3											375 +/- 100

<sup>14</sup> Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.

<sup>15</sup> 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<sup>16</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
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

<sup>16</sup> 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<sup>17</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
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											

<sup>17</sup> 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<sup>18</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
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											

<sup>18</sup> 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<sup>19</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
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											

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<sup>19</sup> 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<sup>20</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
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											

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<sup>20</sup> 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<sup>21</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
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											

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<sup>21</sup> 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<sup>22, 23</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
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

<sup>22</sup> Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.

<sup>23</sup> Due to a training exercise, air sample collection period was 6 days.

**Virginia Department of Health**  
**Week 17: 04/22/19 – 04/29/19<sup>24</sup>**

**Air**

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

<sup>24</sup> Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.

<sup>25</sup> Due to equipment malfunction, air sample was not collected.

**Virginia Department of Health**  
**Week 18: 04/29/19 – 05/06/19<sup>26</sup>**

**Air**

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

<sup>26</sup> Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.

<sup>27</sup> Due to equipment malfunction, air sample was not collected.

**Virginia Department of Health**  
**Week 19: 05/06/19 – 05/13/19<sup>28</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
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

<sup>28</sup> 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<sup>29</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
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

<sup>29</sup> 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<sup>30</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
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											

<sup>30</sup> 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<sup>31</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
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											

<sup>31</sup> Due to competing office obligations, samples were not collected.

**Virginia Department of Health**  
**Week 23: 06/03/19 - 06/10/19<sup>32, 33</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
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

<sup>32</sup> Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.

<sup>33</sup> 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<sup>34</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
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											

<sup>34</sup> Due to training commitments related to VOPEX 2019, samples were not collected.

**Virginia Department of Health**  
**Week 25: 06/17/19 – 06/24/19<sup>35</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
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											

<sup>35</sup> 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<sup>36</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
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											

<sup>36</sup> Due to a scheduled Dominion training event, samples were not collected.

**Virginia Department of Health**  
**Week 27: 07/01/19 – 07/08/19<sup>37</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
SPS-A-1				0.04 +/- 0.008
SPS-A-2				0.09 +/- 0.013
PSP-A-1				0.04 +/- 0.006
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											NDR
SPS-W-2											NDR
SPS-W-3											NDR
NAPS-W-1											2628 +/- 257
NAPS-W-2											150 +/- 71
NAPS-W-3											826 +/- 142

<sup>37</sup> 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<sup>38</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
SPS-A-1				0.04 +/- 0.006
SPS-A-2				0.09 +/- 0.012
PSP-A-1				0.07 +/- 0.010
NAPS-A-1				0.08 +/- 0.010
NAPS-A-2				0.06 +/- 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											1051 +/- 158
SPS-W-2											1802 +/- 213
SPS-W-3											826 +/- 142
NAPS-W-1											5030 +/- 347
NAPS-W-2											1051 +/- 158
NAPS-W-3											1952 +/- 213

<sup>38</sup> Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.

**Virginia Department of Health**  
**Week 29: 07/15/19 – 07/22/19<sup>39</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
SPS-A-1				0.03 +/- 0.005
SPS-A-2				0.05 +/- 0.007
PSP-A-1				0.04 +/- 0.006
NAPS-A-1				0.04 +/- 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											2477 +/- 246
SPS-W-2											NDR
SPS-W-3											NDR
NAPS-W-1											2553 +/- 256
NAPS-W-2											NDR
NAPS-W-3											1426 +/- 188

<sup>39</sup> Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.

**Virginia Department of Health**  
**Week 30: 07/22/19 – 07/29/19<sup>40</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
SPS-A-1				0.05 +/- 0.008
SPS-A-2				0.05 +/- 0.007
PSP-A-1				0.09+/- 0.012
NAPS-A-1				0.05 +/- 0.007
				0.06 +/- 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												1051 +/- 159
SPS-W-2												676 +/- 123
SPS-W-3												676 +/- 123
NAPS-W-1												3078 +/- 275
NAPS-W-2												526 +/- 123
NAPS-W-3												1877 +/- 213

<sup>40</sup> Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.

**Virginia Department of Health**  
**Week 31: 07/29/19 – 08/05/19<sup>41</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
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											

<sup>41</sup> Due to Dominion Monitoring Point location verification, no samples were collected.

**Virginia Department of Health**  
**Week 32: 08/05/19 - 08/12/19<sup>42</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
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											

<sup>42</sup> Due to staffing issues, no samples were collected.

**Virginia Department of Health**  
**Week 33: 08/12/19 – 08/19/19<sup>43</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
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											

<sup>43</sup> Due to Dominion Monitoring Point location verification, no samples were collected.

**Virginia Department of Health**  
**Week 34: 08/19/19 – 08/26/19<sup>44</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
SPS-A-1				0.02 +/- 0.003
SPS-A-2				0.04 +/- 0.005
PSP-A-1				0.04 +/- 0.005
NAPS-A-1 <sup>45</sup>				
NAPS-A-2				0.05 +/- 0.006

**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											225 +/- 71
SPS-W-3											75 +/- 71
NAPS-W-1											2628 +/- 256
NAPS-W-2											NDR
NAPS-W-3											1652 +/- 201

<sup>44</sup> Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.

<sup>45</sup> Due to equipment malfunction, air sample was not collected.

**Virginia Department of Health**  
**Week 35: 08/26/19 - 09/02/19<sup>46</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
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											

<sup>46</sup> Due to HPGE system upgrade, no samples were collected.

**Virginia Department of Health**  
**Week 36: 09/02/19 – 09/09/19<sup>47</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
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											

<sup>47</sup> Due to Dominion Dose Assessment Training, samples were not collected.

**Virginia Department of Health**  
**Week 37: 09/09/19 – 09/16/19** <sup>48, 49</sup>

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
SPS-A-1				0.05 +/- 0.007
SPS-A-2				0.09 +/- 0.012
PSP-A-1				0.12 +/- 0.016
NAPS-A-1				0.17 +/- 0.022
NAPS-A-2				0.22 +/- 0.027

**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 +/- 70
SPS-W-2											NDR
SPS-W-3											NDR
NAPS-W-1											3904 +/- 297
NAPS-W-2											NDR
NAPS-W-3											1502 +/- 185

<sup>48</sup> Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.

<sup>49</sup> Due to the slightly elevated result, on all air filter paper samples they were reanalyzed and confirmed.

**Virginia Department of Health**  
**Week 38: 09/16/19 – 09/23/19** <sup>50</sup>

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
SPS-A-1	NDR	NDR	NDR	0.05 +/- 0.006
SPS-A-2				0.03 +/- 0.004
PSP-A-1				0.04 +/- 0.006
NAPS-A-1				0.05 +/- 0.007
NAPS-A-2 <sup>51</sup>				

**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 +/- 70
SPS-W-2											NDR
SPS-W-3											150 +/- 70
NAPS-W-1											3078 +/- 271
NAPS-W-2											NDR
NAPS-W-3											2402 +/- 243

<sup>50</sup> Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.

<sup>51</sup> Due to equipment malfunction, air sample was not collected.

**Virginia Department of Health**  
**Week 39: 09/23/19 – 09/30/19<sup>52</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
SPS-A-1				0.04 +/- 0.006
SPS-A-2				0.09 +/- 0.012
PSP-A-1				0.07 +/- 0.010
NAPS-A-1				0.07 +/- 0.010
NAPS-A-2 <sup>53</sup>				

**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 <sup>54</sup>											14,715 +/- 590
SPS-W-2											NDR
SPS-W-3											450 +/- 100
NAPS-W-1											3153 +/- 284
NAPS-W-2											NDR
NAPS-W-3											2778 +/- 235

<sup>52</sup> Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.

<sup>53</sup> Due to equipment malfunction, air sample was not collected.

<sup>54</sup> Due to Dominion Power Station release of the Boron Recovery Tank, Tritium level was elevated.

**Virginia Department of Health**  
**Week 40: 09/30/19 - 10/07/19<sup>55</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
SPS-A-1				0.05 +/- 0.007
SPS-A-2				0.06 +/- 0.009
PSP-A-1				0.09 +/- 0.012
NAPS-A-1				0.09 +/- 0.012
NAPS-A-2 <sup>56</sup>				

**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											976 +/- 142
SPS-W-2											300 +/- 71
SPS-W-3											676 +/- 123
NAPS-W-1											4655 +/- 333
NAPS-W-2											375 +/- 71
NAPS-W-3											2928 +/- 265

<sup>55</sup> Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.

<sup>56</sup> Due to equipment malfunction, air sample was not collected.

**Virginia Department of Health**  
**Week 41: 10/07/19 - 10/14/19<sup>57</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
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											

<sup>57</sup> Due to Holiday, 10/14, samples were not collected.

**Virginia Department of Health**  
**Week 42: 10/14/19 - 10/21/19** <sup>58</sup>

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
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 +/- 0.004
NAPS-A-2				0.05 +/- 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											676 +/- 122
SPS-W-2											300 +/- 70
SPS-W-3											526 +/- 122
NAPS-W-1											3604 +/- 290
NAPS-W-2											526 +/- 122
NAPS-W-3											1802 +/- 211

<sup>58</sup> Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.

**Virginia Department of Health**  
**Week 43: 10/21/19 - 10/28/19<sup>59</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
SPS-A-1				0.02 +/- 0.004
SPS-A-2				0.05 +/- 0.007
PSP-A-1				0.04 +/- 0.006
NAPS-A-1				0.05 +/- 0.007
NAPS-A-2				0.04 +/- 0.006

**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											450 +/- 100
SPS-W-2											NDR
SPS-W-3											150 +/- 71
NAPS-W-1											2553 +/- 245
NAPS-W-2											NDR
NAPS-W-3											1126 +/- 158

<sup>59</sup> Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.

**Virginia Department of Health**  
**Week 44: 10/28/19 – 11/04/19<sup>60,61</sup>**

**Air**

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

**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 <sup>62</sup>											38,288 +/- 186
SPS-W-2											225 +/- 1
SPS-W-3											676 +/- 3
NAPS-W-1											2703 +/- 13
NAPS-W-2											300 +/- 2
NAPS-W-3											1351 +/- 7

<sup>60</sup> Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.

<sup>61</sup> Due to all water samples tritium results being elevated, all water samples were reanalyzed to confirm.

<sup>62</sup> Due to Surry Power Station refueling outage, tritium levels were elevated.

**Virginia Department of Health**  
**Week 45: 11/04/19 - 11/11/19<sup>63</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
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											

<sup>63</sup> Due to HPGE being serviced, no samples were collected.

**Virginia Department of Health**  
**Week 46: 11/11/19 - 11/18/19<sup>64</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
SPS-A-1				0.03 +/- 0.005
SPS-A-2				0.06 +/- 0.008
PSP-A-1				0.04 +/- 0.006
NAPS-A-1				0.06 +/- 0.009
NAPS-A-2				0.05 +/- 0.007

**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											1351 +/- 173
SPS-W-2											526 +/- 100
SPS-W-3											1126 +/- 158
NAPS-W-1											4655 +/- 324
NAPS-W-2											450 +/- 100
NAPS-W-3											1877 +/- 212

<sup>64</sup> Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.

**Virginia Department of Health**  
**Week 47: 11/18/19 - 11/25/19<sup>65</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
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											

<sup>65</sup> Due to Thanksgiving holiday, 11/28, samples were not collected.

**Virginia Department of Health**  
**Week 48: 11/25/19 – 12/02/19<sup>66</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
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											225 +/- 71
SPS-W-2											NDR
SPS-W-3											150 +/- 71
NAPS-W-1											4129 +/- 317
NAPS-W-2											NDR
NAPS-W-3											4129 +/- 100

<sup>66</sup> Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.

**Virginia Department of Health**  
**Week 49: 12/02/09 – 12/09/19<sup>67</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
SPS-A-1				0.03 +/- 0.005
SPS-A-2				0.05 +/- 0.007
PSP-A-1				0.04 +/- 0.006
NAPS-A-1				0.05 +/- 0.007
NAPS-A-2				0.05 +/- 0.007

**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											6832 +/- 408
SPS-W-2											901 +/- 142
SPS-W-3											976 +/- 159
NAPS-W-1											7808 +/- 444
NAPS-W-2											601 +/- 123
NAPS-W-3											751 +/- 142

<sup>67</sup> Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.

**Virginia Department of Health**  
**Week 50: 12/09/19 - 12/16/19<sup>68</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
SPS-A-1				0.03 +/- 0.004
SPS-A-2				0.03 +/- 0.004
PSP-A-1				0.03 +/- 0.005
NAPS-A-1				0.06 +/- 0.006
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											1201 +/- 174
SPS-W-2											450 +/- 101
SPS-W-3											751 +/- 142
NAPS-W-1											3754 +/- 302
NAPS-W-2											375 +/- 101
NAPS-W-3											751 +/- 101

<sup>68</sup> Due to the HPGE being inoperable, air and water samples could not be analyzed for gamma.

**Virginia Department of Health**  
**Week 51: 12/16/19 - 12/23/19<sup>69</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
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											

<sup>69</sup> Due to the Christmas holiday, 12/24 & 12/25, samples were not collected.

**Virginia Department of Health**  
**Week 52: 12/23/19 – 12/30/19<sup>70</sup>**

**Air**

Site	Gamma & Radiogas in Air			Air Particulate
	I-131 Activity pCi/meter <sup>3</sup>	Cs-134 Activity pCi/meter <sup>3</sup>	Cs-137 Activity pCi/meter <sup>3</sup>	Gross Beta Activity pCi/meter <sup>3</sup>
SPS-A-1				0.03 +/- 0.004
SPS-A-2				0.05 +/- 0.006
PSP-A-1				0.04 +/- 0.005
NAPS-A-1				0.04 +/- 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											676 +/- 122
SPS-W-2											526 +/- 122
SPS-W-3											751 +/- 141
NAPS-W-1											5856 +/- 366
NAPS-W-2											751 +/- 122
NAPS-W-3											751 +/- 122

<sup>70</sup> Due to the Christmas holiday, 12/24 & 12/25, samples were not collected.

# Virginia Department of Health SURFACE WATER

January 1, 2019 through December 31, 2019

## Newport News Shipbuilder

Qtr.	Date collected	Gamma Activity – pCi/liter					
		Ba-140	Cs-137	I-131	Mn-54	Zn-65	Zr95/Nb95
<b>1st</b>	03/28/19 <sup>71</sup>						
<b>2nd</b>	06/26/19 <sup>72</sup>						
<b>3rd</b>	09/26/19 <sup>73</sup>						
<b>4th</b>	11//29/19 <sup>74</sup>						

## 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
<b>1st</b>	03/28/19 <sup>75</sup>						
<b>2nd</b>	06/26/19 <sup>76</sup>						
<b>3rd</b>	09/26/19 <sup>77</sup>						
<b>4<sup>th</sup></b>	11/29/19 <sup>78</sup>						

<sup>71</sup> Due to the HPGE being inoperable, water sample was not collected.  
<sup>72</sup> Due to the HPGE being inoperable, water sample was not collected.  
<sup>73</sup> Due to the HPGE being inoperable, water sample was not collected.  
<sup>74</sup> Due to the HPGE being inoperable, water sample was not collected.  
<sup>75</sup> Due to the HPGE being inoperable, water sample was not collected.  
<sup>76</sup> Due to the HPGE being inoperable, water sample was not collected.  
<sup>77</sup> Due to the HPGE being inoperable, water sample was not collected.  
<sup>78</sup> Due to the HPGE being inoperable, water sample was not collected.

# 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 <sup>79</sup>						
		Ba-140	Cs-137	I-131	Mn-54	Zn-65	Zr95/Nb95
<b>1st</b>							
	06/26/19 <sup>80</sup>						
		Ba-140	Cs-137	I-131	Mn-54	Zn-65	Zr95/Nb95
<b>2nd</b>							
	09/26/19 <sup>81</sup>						
		Ba-140	Cs-137	I-131	Mn-54	Zn-65	Zr95/Nb95
<b>3rd</b>							
	11/26/19 <sup>82</sup>						
		Ba-140	Cs-137	I-131	Mn-54	Zn-65	Zr95/Nb95
<b>4th</b>							

<sup>79</sup> Due to the HPGE being inoperable, water sample was not collected.

<sup>80</sup> Due to the HPGE being inoperable, water sample was not collected.

<sup>81</sup> Due to the HPGE being inoperable, water sample was not collected.

<sup>82</sup> Due to the HPGE being inoperable, water sample was not collected.

# 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 <sup>83</sup>						
		Ba-140	Cs-137	I-131	Mn-54	Zn-65	Zr95/Nb95
<b>1st</b>							
	06/26/19 <sup>84</sup>						
		Ba-140	Cs-137	I-131	Mn-54	Zn-65	Zr95/Nb95
<b>2nd</b>							
	09/26/19 <sup>85</sup>						
		Ba-140	Cs-137	I-131	Mn-54	Zn-65	Zr95/Nb95
<b>3rd</b>							
	11/29/19 <sup>86</sup>						
		Ba-140	Cs-137	I-131	Mn-54	Zn-65	Zr95/Nb95
<b>4th</b>							

<sup>83</sup> Due to the HPGE being inoperable, water sample was not collected.

<sup>84</sup> Due to the HPGE being inoperable, water sample was not collected.

<sup>85</sup> Due to the HPGE being inoperable, water sample was not collected.

<sup>86</sup> Due to the HPGE being inoperable, water sample was not collected.

# 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 <sup>87</sup>						
		Ba-140	Cs-137	I-131	Mn-54	Zn-65	Zr95/Nb95
<b>1st</b>							
	06/26/19 <sup>88</sup>						
		Ba-140	Cs-137	I-131	Mn-54	Zn-65	Zr95/Nb95
<b>2nd</b>							
	09/26/19 <sup>89</sup>						
		Ba-140	Cs-137	I-131	Mn-54	Zn-65	Zr95/Nb95
<b>3rd</b>							
	11/29/19 <sup>90</sup>						
		Ba-140	Cs-137	I-131	Mn-54	Zn-65	Zr95/Nb95
<b>4rd</b>							

<sup>87</sup> Due to the HPGE being inoperable, water sample was not collected.

<sup>88</sup> Due to the HPGE being inoperable, water sample was not collected.

<sup>89</sup> Due to the HPGE being inoperable, water sample was not collected.

<sup>90</sup> Due to the HPGE being inoperable, water sample was not collected.

# 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 <sup>91</sup>	Cs-134	Cs-137	Co-58	Co-60
James River - Pier 1  NNSB-S-1	06/26/19 <sup>92</sup>	Cs-134	Cs-137	Co-58	Co-60
James River - Pier 1  NNSB-S-1	09/26/19 <sup>93</sup>	Cs-134	Cs-137	Co-58	Co-60
James River - Pier 1  NNSB-S-1	11/29/19 <sup>94</sup>	Cs-134	Cs-137	Co-58	Co-60

<sup>91</sup> Due to the HPGE being inoperable, silt sample was not collected.

<sup>92</sup> Due to the HPGE being inoperable, silt sample was not collected.

<sup>93</sup> Due to the HPGE being inoperable, silt sample was not collected.

<sup>94</sup> Due to the HPGE being inoperable, silt sample was not collected.

# 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 <sup>95</sup>	Cs-134	Cs-137	Co-58	Co-60
James River - Shipway 11  NNSB-S-2	06/26/19 <sup>96</sup>	Cs-134	Cs-137	Co-58	Co-60
James River - Shipway 11  NNSB-S-2	09/26/19 <sup>97</sup>	Cs-134	Cs-137	Co-58	Co-60
James River - Shipway 11  NNSB-S-2	11/29/19 <sup>98</sup>	Cs-134	Cs-137	Co-58	Co-60

<sup>95</sup> Due to the HPGE being inoperable, silt sample was not collected.

<sup>96</sup> Due to the HPGE being inoperable, silt sample was not collected.

<sup>97</sup> Due to the HPGE being inoperable, silt sample was not collected.

<sup>98</sup> Due to the HPGE being inoperable, silt sample was not collected.

# 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 NNSY-S-1	03/28/19 <sup>99</sup>	Cs134	Cs137	Co58	Co60
Elizabeth River Drydock #4 NNSY-S-1	06/26/19 <sup>100</sup>	Cs134	Cs137	Co58	Co60
Elizabeth River Drydock #4 NNSY-S-1	09/26/19 <sup>101</sup>	Cs134	Cs137	Co58	Co60
Elizabeth River Drydock #4 NNSY-S-1	11/29/19 <sup>102</sup>	Cs134	Cs137	Co58	Co60

<sup>99</sup> Due to the HPGE being inoperable, silt sample was not collected.

<sup>100</sup> Due to the HPGE being inoperable, silt sample was not collected.

<sup>101</sup> Due to the HPGE being inoperable, silt sample was not collected.

<sup>102</sup> Due to the HPGE being inoperable, silt sample was not collected.

# Virginia Department of Health SILT

January 1, 2019 through December 31, 2019

## Norfolk Naval Shipyard

Location	Date Collected	Gamma Activity pCi/gram			
<b>Elizabeth River Drydock #8</b>	03/28/19 <sup>103</sup>				
<b>NNSY-S-2</b>	<b>Cs134</b>	<b>Cs137</b>	<b>Co58</b>	<b>Co60</b>	
<b>Elizabeth River Drydock #8</b>	06/26/19 <sup>104</sup>				
<b>NNSY-S-2</b>	<b>Cs134</b>	<b>Cs137</b>	<b>Co58</b>	<b>Co60</b>	
<b>Elizabeth River Drydock #8</b>	09/20/19 <sup>105</sup>				
<b>NNSY-S-2</b>	<b>Cs134</b>	<b>Cs137</b>	<b>Co58</b>	<b>Co60</b>	
<b>Elizabeth River Drydock #8</b>	11/29/19 <sup>106</sup>				
<b>NNSY-S-2</b>	<b>Cs134</b>	<b>Cs137</b>	<b>Co58</b>	<b>Co60</b>	

<sup>103</sup> Due to the HPGE being inoperable, silt sample was not collected.

<sup>104</sup> Due to the HPGE being inoperable, silt sample was not collected.

<sup>105</sup> Due to the HPGE being inoperable, silt sample was not collected.

<sup>106</sup> Due to the HPGE being inoperable, silt sample was not collected.

# 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 <sup>107</sup>				
NNSY-S-3	Cs134	Cs137	Co58	Co60	
Elizabeth River Drydock #8	06/26/19 <sup>108</sup>				
NNSY-S-3	Cs134	Cs137	Co58	Co60	
Elizabeth River Drydock #8	09/20/19 <sup>109</sup>				
NNSY-S-3	Cs134	Cs137	Co58	Co60	
Elizabeth River Drydock #8	11/29/19 <sup>110</sup>				
NNSY-S-3	Cs134	Cs137	Co58	Co60	

<sup>107</sup> Due to the HPGE being inoperable, silt sample was not collected.

<sup>108</sup> Due to the HPGE being inoperable, silt sample was not collected.

<sup>109</sup> Due to the HPGE being inoperable, silt sample was not collected.

<sup>110</sup> Due to the HPGE being inoperable, silt sample was not collected.

# 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 <sup>111</sup>				
3rd	09/01/19 <sup>112</sup>				

### 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 <sup>113</sup>				
4th	10/04/19 <sup>114</sup>				

Note: Silt samples are collected bi-annually.

<sup>111</sup> Due to the HPGE being inoperable, silt sample was not collected.

<sup>112</sup> Due to the HPGE being inoperable, silt sample was not collected.

<sup>113</sup> Due to the HPGE being inoperable, silt sample was not collected.

<sup>114</sup> Due to the HPGE being inoperable, silt sample was not collected.

# 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	04/05/07/19 /18	Ba-140	<0.05 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
		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
		NAPS- F-1 (Fish)	04/03/19
Cs-134	<0.01 pCi/g		
Cs-137	<0.01 pCi/g		
Co-58	<0.01 pCi/g		
Co-60	<0.01 pCi/g		
I-131	<0.04 pCi/g		
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		
Surry Discharge Canal	04/03/19		
		Cs-134	<0.01 pCi/g
		Cs-137	<0.01 pCi/g
		Co-58	<0.01 pCi/g
		Co-60	<0.01 pCi/g
		I-131	<0.04 pCi/g
		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
		SPS-F-1 (Fish)	04/03/19
Cs-134	<0.01 pCi/g		
Cs-137	<0.01 pCi/g		
Co-58	<0.01 pCi/g		
Co-60	<0.01 pCi/g		
I-131	<0.04 pCi/g		
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 2<sup>nd</sup> and 4<sup>th</sup> 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	
<b>North Anna Cooling Lagoon</b>	11/13/19	Ba-140	<0.14 pCi/g	
		Cs-134	<0.01 pCi/g	
		Cs-137	<0.01 pCi/g	
		Co-58	<0.01 pCi/g	
		<b>NAPS- F-1</b>	Co-60	<0.01 pCi/g
		<b>(Fish)</b>	I-131	<0.09 pCi/g
			Fe-59	<0.03 pCi/g
			Mn-54	<0.01 pCi/g
			Ru-106	<0.09 pCi/g
			Ag-110M	<0.01 pCi/g
			Zn-65	<0.02 pCi/g
			Nb-95	<0.02 pCi/g
<b>Surry Discharge Canal</b>	10/15/19	Ba-140	<0.03 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	
		<b>SPS-F-1</b>	I-131	<0.01 pCi/g
		<b>(Fish)</b>	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 2<sup>nd</sup> and 4<sup>th</sup> 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
<b>Surry Power Station</b>	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
		I-131	<0.07 pCi/g
		Fe-59	<0.01 pCi/g
		Mn-54	<0.01 pCi/g
		Ru-106	<0.03 pCi/g
		Ag-110M	<0.01 pCi/g
<b>SPS-R-1 (Clams and Oysters)</b>		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

<b>Surry County - Epps Dairy</b> <b>SPS-M-1</b> 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
<b>Surry County - Epps Dairy</b> <b>SPS-M-1</b> 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
<b>Surry County - Epps Dairy</b> <b>SPS-M-1</b> 3rd Quarter Date: 07/02/19	
Isotope	Results - pCi/liter
Ba-140	< 19.0 pCi/L
Cs-134	< 5.0 pCi/L
Cs-137	< 3.0 pCi/L
K-40	1.6 ± 0.1 g/L
I-131	< 5.0 pCi/L
Sr-89	< 4.0 pCi/L
Sr-90	< 0.42 ± 0.31 pCi/L

# Virginia Department of Health Milk

January 1, 2019 through December 31, 2019

Surry County - Epps Dairy SPS-M-1 4th Quarter Date: 10/03/19	
Isotope	Results - pCi/liter
Ba-140	< 14.0 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	0.63 +/- 0.27 pCi/L

# Virginia Department of Health

## VEGETATION<sup>115</sup>

January 1, 2019 through December 31, 2019

Location	Date collected	Type	Isotope	Results pCi/Gram (wet weight)
<b>Surry County</b>				
<b>Private garden SPS-V-1</b>	2nd Quarter	Mixed Greens	I-131	
			Cs-134	
			Cs-137	
<b>Louisa County</b>				
<b>Private Garden NAPS-V-1</b>	2nd Quarter	Mixed Greens	I-131	
			Cs-134	
			Cs-137	
<b>Surry County</b>				
<b>Private garden SPS-V-1</b>	4th Quarter	Mixed Greens	I-131	
			Cs-134	
			Cs-137	
<b>Louisa County</b>				
<b>Private Garden NAPS-V-1</b>	4th Quarter	Mixed Greens	I-131	
			Cs-134	
			Cs-137	

Note: Vegetation is collected bi-annually when available.

<sup>115</sup> Due to the HPGE being inoperable, vegetation samples for Surry and Louisa, 2<sup>nd</sup> & 4<sup>th</sup> quarters, were not collected.

# Virginia Department of Health

## AMBIENT GAMMA EXPOSURE

December 17, 2019 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

June 18, 2019 through October 7, 2019

### THIRD QUARTER

Location	Station	Net Exposure Rate mR/Std Qtr +/- 2S.D.		
Jamestown – Historical site	SPS-D-1	34.96	+/-	11.82
Williamsburg – Airport	SPS-D-2	28.19	+/-	10.62
Williamsburg – Busch Gardens	SPS-D-3	38.28	+/-	12.37
Newport News - Lee Hall	SPS-D-4	41.58	+/-	12.90
Naval Weapons Station – 1	SPS-D-5	28.01	+/-	10.59
Newport News – Fort Eustis	SPS-D-6	29.21	+/-	10.81
Surry – Route 628	SPS-D-7	21.36	+/-	9.24
Surry – Lawnes Creek	SPS-D-8	35.66	+/-	11.94
Surry Power Station	SPS-D-9	28.72	+/-	10.72
Surry – Hog Point	SPS-D-10	31.34	+/-	11.20
Surry – Bacon’s Castle	SPS-D-11	26.36	+/-	10.27
Surry – Alliance	SPS-D-12	29.62	+/-	10.89
Surry – Scotland Wharf	SPS-D-13	28.29	+/-	10.75
Surry – Lebanon Baptist Church	SPS-D-14	27.42	+/-	10.47
Louisa County - Mineral	NAPS-D-1	32.19	+/-	11.35
Louisa County – Wares Crossroads	NAPS-D-2	31.85	+/-	11.29
Louisa County – Good Hope Church	NAPS-D-3	41.07	+/-	12.82
Spotsylvania – Route 713	NAPS-D-4	31.63	+/-	11.25
Spotsylvania Route 614	NAPS-D-5	33.08	+/-	11.50
Spotsylvania – Levy	NAPS-D-6	36.44	+/-	12.07
Louisa County – Bumpass Fire Dept.	NAPS-D-7	33.06	+/-	11.50
Louisa County – Fred Hall	NAPS-D-8	29.06	+/-	10.78
Louisa County – Aspen Hill	NAPS-D-9	47.71	+/-	13.81
Louisa County – Route 685	NAPS-D-10	32.33	+/-	11.37
Louisa County – Route 700	NAPS-D-11	39.88	+/-	12.63
North Anna Power Station	NAPS-D-12	41.09	+/-	12.82
Pocahontas State Park (Control)	PSP-D-1	52.64	+/-	14.51
Radiological Health	ORH-D-1	15.24	+/-	7.81
Radiological Health	ORH-D-2	17.63	+/-	8.40

# Virginia Department of Health

## AMBIENT GAMMA EXPOSURE

October 7, 2019 to December 17, 2019

### FOURTH QUARTER

Location	Station	Net Exposure Rate mR/Std Qtr +/- 2S.D.		
Jamestown – Historical site	SPS-D-1	21.88	+/-	9.36
Williamsburg – Airport	SPS-D-2	27.14	+/-	10.42
Williamsburg – Busch Gardens	SPS-D-3	30.31	+/-	11.01
Newport News - Lee Hall	SPS-D-4	34.12	+/-	11.68
Naval Weapons Station – 1	SPS-D-5	26.85	+/-	10.36
Newport News – Fort Eustis	SPS-D-6	24.36	+/-	9.87
Surry – Route 628	SPS-D-7	20.43	+/-	9.04
Surry – Lawnes Creek	SPS-D-8	26.17	+/-	10.23
Surry Power Station	SPS-D-9	25.46	+/-	10.09
Surry – Hog Point	SPS-D-10	25.34	+/-	10.07
Surry – Bacon’s Castle	SPS-D-11	25.08	+/-	10.02
Surry – Alliance	SPS-D-12	26.04	+/-	10.21
Surry – Scotland Wharf	SPS-D-13	26.53	+/-	10.30
Surry – Lebanon Baptist Church	SPS-D-14	19.45	+/-	8.82
Louisa County - Mineral	NAPS-D-1	33.51	+/-	11.58
Louisa County – Wares Crossroads	NAPS-D-2	23.36	+/-	9.67
Louisa County – Good Hope Church	NAPS-D-3	28.99	+/-	10.77
Spotsylvania – Route 713	NAPS-D-4	27.67	+/-	10.52
Spotsylvania Route 614	NAPS-D-5	26.08	+/-	10.21
Spotsylvania – Levy	NAPS-D-6	30.71	+/-	11.08
Louisa County – Bumpass Fire Dept.	NAPS-D-7	28.21	+/-	10.62
Louisa County – Fred Hall	NAPS-D-8	25.12	+/-	10.02
Louisa County – Aspen Hill	NAPS-D-9	33.69	+/-	11.61
Louisa County – Route 685	NAPS-D-10	31.05	+/-	11.14
Louisa County – Route 700	NAPS-D-11	30.58	+/-	11.06
North Anna Power Station	NAPS-D-12	34.58	+/-	11.76
Pocahontas State Park (Control)	PSP-D-1	37.71	+/-	12.28
Radiological Health	ORH-D-1	15.30	+/-	7.82
Radiological Health	ORH-D-2	15.68	+/-	7.92

# COMMONWEALTH OF VIRGINIA

## DEPARTMENT OF HEALTH

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### 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 <sup>3</sup>
<b>B&amp;W-A-1</b>				
1st	01/09/2019	-	01/15/2019	0.001

### SECOND QUARTER REPORT

	Start	Date	Stop	Gross Alpha Activity pCi/meter <sup>3</sup>
<b>B&amp;W-A-1</b>				
2nd	04/03/2019	-	04/09/2019	0.001

### THIRD QUARTER REPORT

	Start	Date	Stop	Gross Alpha Activity pCi/meter <sup>3</sup>
<b>B&amp;W-A-1</b>				
3rd	07/04/2019	-	07/09/2019	0.001

### FOURTH QUARTER REPORT

	Start	Date	Stop	Gross Alpha Activity pCi/meter <sup>3</sup>
<b>B&amp;W-A-1</b>				
4th	10/02/19	-	10/08/19	0.001

# Virginia Department of Health

## SOIL

January 1, 2019 through December 31, 2019

Location	Date	Distance & Direction	Type	Alpha Activity ppm
<b>Eastern Site Boundary</b> <b>Ball field</b> B&W-S-1	10/09/19	Site Boundary	Soil	<1.0
<b>James River Shoreline</b> <b>Near Six Mile Bridge</b> <b>“control”</b> B&W-S-2	10/09/19	1.5 miles SW	Soil	<1.0

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
<b>James River Shoreline</b> <b>Near Ball field at</b> <b>eastern site boundary</b> <b>B&amp;W-W-1</b>		Approx. 3 miles downstream	<2.0
<b>James River Shoreline</b> <b>Near Six Mile Bridge</b> <b>“control”</b> <b>B&amp;W-W-2</b>		Approx. 1.5 miles upstream	<2.0

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
<b>Eastern site boundary Ball field B&amp;W-V-1</b>	10/09/19	Approx. 3 miles downstream	<1.0
<b>James River Shoreline off Rt. 460 "control" B&amp;W-V-2</b>	10/09/19	Approx. 4.5 Miles SW	<1.0

Vegetation collected annually.

Note: Uranium separation followed by alpha counting.

COMMONWEALTH OF VIRGINIA  
DEPARTMENT OF HEALTH

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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.