

COMMONWEALTH OF VIRGINIA  
DEPARTMENT OF HEALTH

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**ENVIRONMENTAL  
RADIATION  
MONITORING  
PROGRAM**

**2018  
ANNUAL REPORT**



## **ACKNOWLEDGEMENTS**

The Office of Radiological Health acknowledges the following organizations and agencies that provide assistance to the Radiological Environmental Monitoring Program:

- Babcock & Wilcox
- Department of Agriculture and Consumer Services
  - Office of Dairy and Foods
- Department of Conservation and Recreation
  - Division of State Parks
- Department of General Services
  - Division of Consolidated Laboratory Services (DCLS)
- Dominion Virginia Power
- Newport News Shipbuilding
- Norfolk Naval Shipyard

## PREFACE

The Office of Radiological Health (ORH) maintains an extensive environmental monitoring program in order to characterize radiological conditions around certain fixed nuclear facilities in the Commonwealth of Virginia. This program provides an independent assessment of each facility's compliance with applicable federal and state regulations as they relate to offsite release limits. Each of these fixed nuclear facilities has its own routine surveillance program. The objectives of ORH's environmental monitoring program include:

- a) Providing information useful in assessing the adequacy of programs designed to protect the public;
- b) Meeting the requirements of regulatory agencies;
- c) Verifying radionuclide containment and plant waste management practices;
- d) Meeting legal liability obligations; and
- e) Providing public assurance and acceptance (NCRP, 1976)\*.

In addition to these stated objectives, ORH has identified other objectives such as;

- a) Maintenance of a database containing background radionuclide levels and trends to assist with the assessment of other environmental data;
- b) Identification of radiological releases not associated with the licensed facility; and
- c) Maintenance of equipment and procedures used in emergency preparedness and response activities.

This report is distributed to the licensee, as well as state and local agencies, which have a direct interest in the results. This report is available for download at:

<http://www.vdh.virginia.gov/radiological-health/environmental-monitoring/>

Readers are invited to submit any comments or questions regarding this report to the Office of Radiological Health.

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\*NCRP (2006) National Council on Radiation Protection and Measurements, *Environmental Radiation Measurements* (1976) - Report No. 050, National Council on Radiation Protection and Measurements, Washington.

# **SAMPLING PROGRAM**

## **AIR PARTICULATE AND RADIOGAS**

Stationary air samplers are deployed at sites around both Surry and North Anna Power Stations. In addition, a separate stationary air sampler is located at Pocahontas State Park which serves as a control site. Pumps run approximately 168 hours per week at an average flow rate of 115 cubic feet per hour. All samplers are continuously equipped with a charcoal filter and an air particulate filter which are analyzed weekly for gross beta and gamma activity with special emphasis on Iodine-131 retention. All stations, except the control site, are collocated with utility air samplers.

There is one air sampler located onsite at Babcock & Wilcox Technologies. This air pump is equipped with air particulate filters and runs approximately 168 hours per week with an average flow rate of 70 cubic feet per hour. Samples from this location are obtained quarterly and undergo gross alpha analysis

## **FISH**

Fish samples are collected biannually in Lake Anna near North Anna Power Station and from the discharge canal at Surry Power Station. Each sample consists of approximately one kilogram of flesh from a variety of fish species. All fish samples are counted for gamma activity with data based on wet weight.

## **MILK**

Raw milk samples are collected quarterly a dairy operating within the 10-mile Emergency Planning Zone (EPZ) around Surry Power Station. Currently there are no dairy farms within the 10-mile EPZ around North Anna Power Station. Samples consists of one gallon of raw milk with no preservatives added. Raw milk is a primary indicator of radioiodine incorporation in the food chain. Samples are analyzed for gamma activity and Strontium-89 & 90. Milk samples are further radiochemically separated for Iodine-131.

## **SHELLFISH**

Shellfish are indicators of incorporation of radioactivity in the food chain. Selected species are collected as a part of the environmental surveillance program around Surry Power Station (SPS). Samples consist of one kilogram of flesh and are collected annually approximately 0.5 mile off the mouth of the SPS discharge canal in the James River. All shellfish samples are counted for gamma activity with data based on activity per unit of wet weight.

## **SILT**

Silt is an indicator of radioactive deposition in sediment. Samples are collected biannually next to the Waste Treatment Building at North Anna Power Station and from the discharge canal at Surry Power Station. Silt is also collected quarterly at the Norfolk Naval Shipyard on the Elizabeth River and at Newport News Shipbuilding on the James River. Silt samples are counted for gross alpha and/or beta activity depending on collection location. Selected silt samples are further analyzed for gamma activity. Data is based on activity per unit of dry weight.

## **SOIL**

Two soil samples are collected annually at the Babcock & Wilcox facility. Samples are collected from a ball field on the facility's eastern boundary and from Riverside Park. Samples obtained undergo alpha analysis.

## **VEGETATION**

Green leafy vegetation can serve as an indicator of incorporation of radioactivity in the food chain. Samples are collected biannually from home gardens, small farms, or other suitable locations near each nuclear power station. Samples typically consist of approximately one kilogram of broad leaf plant species. When leafy vegetation is unavailable, tall grass or similar plants may be substituted. Vegetation is counted for gamma activity with data based on activity per unit wet weight.

In addition to vegetation collected near each nuclear power station, samples are collected annually from two sites at Babcock & Wilcox. Samples consist of approximately one kilogram of grass or broad leaf plant species collected from the ball field at the eastern site boundary and from Riverside Park. These samples undergo alpha analysis.

## **SURFACE WATER**

Surface water is collected weekly near the discharge point at each nuclear power facility. Automatic sampling units designed to pull three aliquots of water per day operate continuously throughout the week. All water collected is composited and tested to provide data on radioactive effluents. In addition to the samples collected near the power stations, control sites on Lake Anna and the James River are also tested on a weekly basis.

Surface water is also collected quarterly on the James River at Newport News Shipbuilding (NNSB) and on the Elizabeth River at the Norfolk Naval Shipyard (NNSY) to ensure that operations at these facilities result in minimal radioactive effluents.

Two surface water samples are collected annually from the James River at Babcock & Wilcox. Samples are collected from the ball field at the eastern site boundary and from Riverside Park. Samples undergo uranium separation followed by alpha counting.

## **AMBIENT GAMMA EXPOSURE**

Ambient gamma exposure readings are collected using optically stimulated luminescence dosimeters (OSLDs) located strategically around each power station. There are a total of twelve OSLD sample locations at North Anna Power Station and fourteen sites at Surry Power Station. One control OSLD station is located at Pocahontas State Park. The OSLD's are processed quarterly for net exposure by ORH staff using a Landauer microStar system. This analysis results in a millirem/quarter reading.

## **REPORTING PENDING SAMPLE ANALYSIS RESULTS**

When sample data fields in this report indicate that results have not yet been performed or reported by DCLS at the time of report publication, then the report will be updated once those results are made available.

## **Sources of Radioactivity in the Environment**

Naturally occurring or background radioactivity is found virtually everywhere within the environment. The decay of primordial terrestrial sources, such as uranium and thorium, is one contributing factor to this background radioactivity. Other sources are continually produced in our upper atmosphere through the interaction of atoms with cosmic rays.

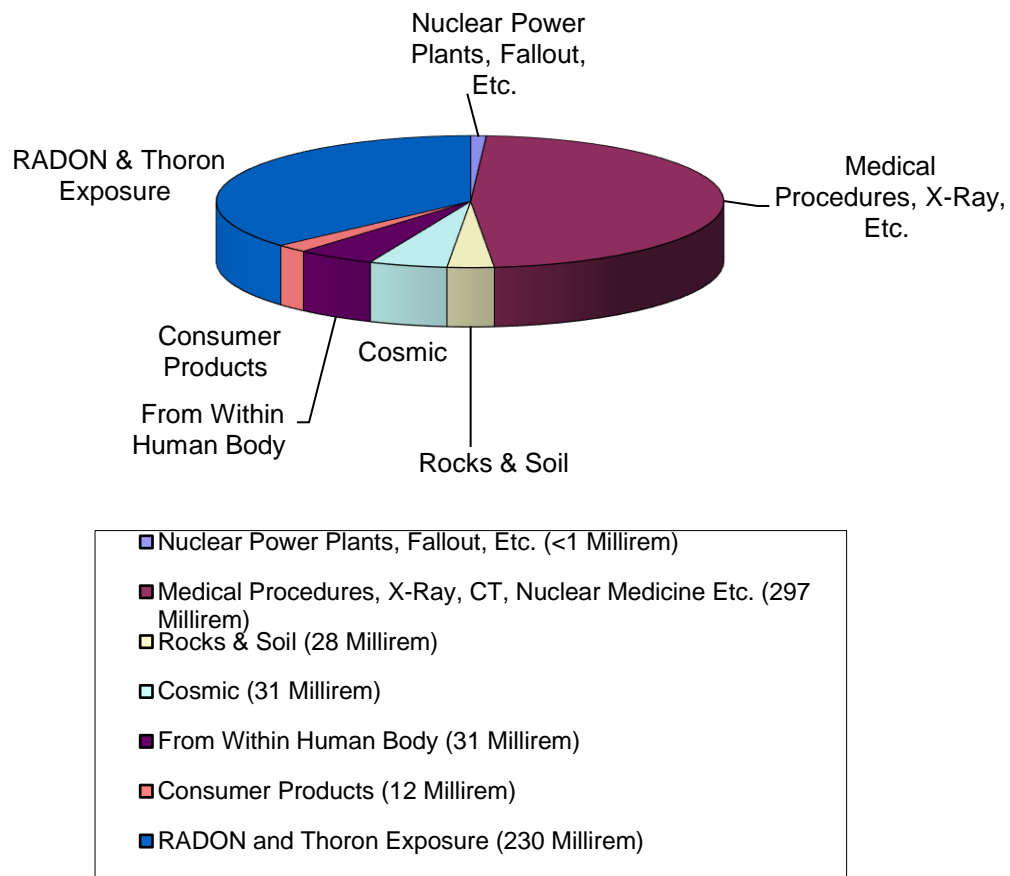
Environmental radiation levels are also influenced by human practices. The use of radioactive materials in the healing arts, uranium mining and milling operations, and nuclear power generation all are potentially contributing factors. In addition, background radiation levels were altered by residual fallout from nuclear weapons testing. The United States ceased atmospheric testing following adoption of the 1963 Nuclear Test Ban Treaty. Only long-lived fallout radionuclides currently remain.

## **Dose to the Public**

The primary source of natural radiation dose received by the general public is due to radon exposure (see Figure 1 next page). The average individual receives approximately 230 millirem/year from radon and less than 1 millirem/year from nuclear facilities; another 81 millirem/year are received from natural sources and approximately 297 mrem/year from medical procedures. The total average whole body dose nationwide is approximately 620 mrem/year.

Inherent in all standards for radiation control is the philosophy of limiting exposure whenever possible. This principle is termed “AS LOW AS REASONABLY ACHIEVABLE” (ALARA). In practice, this philosophy continues to result in very low average doses to the public from the nuclear facilities cited earlier. The environmental monitoring program maintained by the Office of Radiological Health continues to verify compliance to these standards.

**FIGURE 1: Sources of Radiation Exposure**



Source: National Council on Radiation Protection & Measurement; Estimated Annual Dose of 620 Millirem for an average person in the U.S.A.

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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: 01/01/18 - 01/08/18	Weekly	18	
Week 2: 01/08/18 - 01/15/18	Weekly	19	
Week 3: 01/15/18 - 01/22/18	Weekly	20	
Week 4: 01/22/18 - 01/29/18	Weekly	21	
Week 5: 01/29/18 - 02/05/18	Weekly	22	
Week 6: 02/05/18 - 02/12/18	Weekly	23	
Week 7: 02/12/18 - 02/19/18	Weekly	24	
Week 8: 02/19/18 - 02/26/18	Weekly	25	
Week 9: 02/26/18 - 03/05/18	Weekly	26	
Week 10: 03/05/18 - 03/12/18	Weekly	27	
Week 11: 03/12/18 - 03/19/18	Weekly	28	
Week 12: 03/19/18 - 03/26/18	Weekly	29	
Week 13: 03/26/18 - 04/02/18	Weekly	30	
Week 14: 04/02/18 - 04/09/18	Weekly	31	
Week 15: 04/09/18 - 04/16/18	Weekly	32	
Week 16: 04/16/18 - 04/23/18	Weekly	33	
Week 17: 04/23/18 - 04/30/18	Weekly	34	
Week 18: 04/30/18 - 05/07/18	Weekly	35	
Week 19: 05/07/18 - 05/14/18	Weekly	36	
Week 20: 05/14/18 - 05/21/18	Weekly	37	
Week 21: 05/21/18 - 05/28/18	Weekly	38	
Week 22: 05/28/18 - 06/04/18	Weekly	39	
Week 23: 06/04/18 - 06/11/18	Weekly	40	
Week 24: 06/11/18 - 06/18/18	Weekly	41	
Week 25: 06/18/18 - 06/25/18	Weekly	42	
Week 26: 06/25/18 - 07/02/18	Weekly	43	
Week 27: 07/02/18 - 07/09/18	Weekly	44	
Week 28: 07/09/18 - 07/16/18	Weekly	45	
Week 29: 07/16/18 - 07/23/18	Weekly	46	
Week 30: 07/23/18 - 07/30/18	Weekly	47	
Week 31: 07/30/18 - 08/06/18	Weekly	48	
Week 32: 08/06/18 - 08/13/18	Weekly	49	
Week 33: 08/13/18 - 08/20/18	Weekly	50	
Week 34: 08/20/18 - 08/27/18	Weekly	51	
Week 35: 08/27/18 - 09/03/18	Weekly	52	
Week 36: 09/03/18 - 09/10/18	Weekly	53	
Week 37: 09/10/18 - 09/17/18	Weekly	54	

## Sample Analysis Results for Surry & North Anna Power Stations

WEEK	FREQUENCY	PAGE	COMMENTS
Week 38: 09/17/18 - 09/24/18	Weekly	55	
Week 39: 09/24/18 - 10/01/18	Weekly	56	
Week 40: 10/01/18 - 10/08/18	Weekly	57	
Week 41: 10/08/18 - 10/15/18	Weekly	58	
Week 42: 10/15/18 - 10/22/18	Weekly	59	
Week 43: 10/22/18 - 10/29/18	Weekly	60	
Week 44: 10/29/18 - 11/05/18	Weekly	61	
Week 45: 11/05/18 - 11/12/18	Weekly	62	
Week 46: 11/12/18 - 11/19/18	Weekly	63	
Week 47: 11/19/18 - 11/26/18	Weekly	64	
Week 48: 11/26/18 - 12/03/18	Weekly	65	
Week 49: 12/03/18 - 12/10/18	Weekly	66	
Week 50: 12/10/18 - 12/17/18	Weekly	67	
Week 51: 12/17/18 - 12/24/18	Weekly	68	
Week 52: 12/24/18 - 12/31/18	Weekly	69	

## Other Sample Locations

SAMPLE	LOCATION	TYPE	FREQUENCY	PAGE
<b><u>Surface Water<sup>1</sup></u></b>				
NNSB-W-1	James River - NNSB-Pier 1	Surface Water	Quarterly	70
NNSB-W-2	James River - NNSB-Shipway 11	Surface Water	Quarterly	70
NNSY-W-1	Elizabeth River - NNSY - Drydock #4	Surface Water	Quarterly	71
NNSY-W-2	Elizabeth River - NNSY - Drydock #8	Surface Water	Quarterly	72
NNSY-W-3	Elizabeth River - NNSY - Wet Slip #1	Surface Water	Quarterly	73
<b><u>Silt<sup>2</sup></u></b>				
NNSB-S-1	James River - NNSB - Pier 1	Silt	Quarterly	74
NNSB-S-2	James River - NNSB-Shipway 11	Silt	Quarterly	75
NNSY-S-1	Elizabeth River - NNSY - Drydock #4	Silt	Quarterly	76
NNSY-S-2	Elizabeth River - NNSY - Drydock #8	Silt	Quarterly	77
NNSY-S-3	Elizabeth River - NNSY - Wet Slip #1	Silt	Quarterly	78

<sup>1</sup> Beginning 3<sup>rd</sup> Quarter 2018 all NNSB & NNSY water samples will be analyzed by VDH-ORH

<sup>2</sup> Beginning 3<sup>rd</sup> Quarter 2018 all NNSB & NNSY silt samples will be analyzed by VDH-ORH

## 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	79
NAPS-S-1	Waste Treatment Shoreline Soil	Soil	2x per year	79
<b>FISH</b>				
NAPS-F-1	North Anna Lake – Second Cooling Lagoon	Edible Fish	2x per year	80-81
SPS-F-1	James River – .5 miles off Discharge Canal	Edible Fish	2x per year	80-81
SPS-R-1	James River- Various Locations	Shellfish	Annually	82
<b>MILK</b>				
SPS-M-1	Surry County-Epps Dairy	Raw	Quarterly	83-84
NAPS-M-1	Louisa County-Lakeside Dairy	Raw	Discontinued	85
<b>VEGETATION</b>				
SPS-V-1	Surry County – Local Farmers	Edible Vegetation	2x per year	86
NAPS-V-1	Louisa County – Local Farmers	Edible Vegetation	2x per year	86

## 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	87-90
Williamsburg – Airport	SPS-D-2	Quarterly	Gamma in Air	87-90
Williamsburg – Busch Gardens	SPS-D-3	Quarterly	Gamma in Air	87-90
Newport News - Lee Hall	SPS-D-4	Quarterly	Gamma in Air	87-90
Naval Weapons Station – 1	SPS-D-5	Quarterly	Gamma in Air	87-90
Newport News – Fort Eustis	SPS-D-6	Quarterly	Gamma in Air	87-90
Surry – Route 628	SPS-D-7	Quarterly	Gamma in Air	87-90
Surry – Lawnes Creek	SPS-D-8	Quarterly	Gamma in Air	87-90
Surry Power Station	SPS-D-9	Quarterly	Gamma in Air	87-90
Surry – Hog Point	SPS-D-10	Quarterly	Gamma in Air	87-90
Surry – Bacon’s Castle	SPS-D-11	Quarterly	Gamma in Air	87-90
Surry – Alliance	SPS-D-12	Quarterly	Gamma in Air	87-90
Surry – Scotland Wharf	SPS-D-13	Quarterly	Gamma in Air	87-90
Surry – Lebanon Baptist Church	SPS-D-14	Quarterly	Gamma in Air	87-90
Louisa County - Mineral	NAPS-D-1	Quarterly	Gamma in Air	87-90
Louisa County – Wares Crossroads	NAPS-D-2	Quarterly	Gamma in Air	87-90
Louisa County – Good Hope Church	NAPS-D-3	Quarterly	Gamma in Air	87-90
Spotsylvania – Route 713	NAPS-D-4	Quarterly	Gamma in Air	87-90
Spotsylvania Route 614	NAPS-D-5	Quarterly	Gamma in Air	87-90
Spotsylvania – Levy	NAPS-D-6	Quarterly	Gamma in Air	87-90
Louisa County – Bumpass Fire Dept.	NAPS-D-7	Quarterly	Gamma in Air	87-90
Louisa County – Fred Hall	NAPS-D-8	Quarterly	Gamma in Air	87-90
Louisa County – Aspen Hill	NAPS-D-9	Quarterly	Gamma in Air	87-90
Louisa County – Route 685	NAPS-D-10	Quarterly	Gamma in Air	87-90
Louisa County – Route 700	NAPS-D-11	Quarterly	Gamma in Air	87-90
North Anna Power Station	NAPS-D-12	Quarterly	Gamma in Air	87-90
Pocahontas State Park (Control)	PSP-D-1	Quarterly	Gamma in Air	87-90
Radiological Health	ORH-D-1	Quarterly	Gamma in Air	87-90
Radiological Health	ORH-D-2	Quarterly	Gamma in Air	87-90

## Sampling Locations - Babcock & Wilcox

SAMPLE	LOCATION	TYPE	FREQUENCY	PAGE
<b><u>AIR</u></b>				
B&W-A-1	Eastern Site Boundary - Ballfield	Air Particulate	Quarterly	92
<b><u>SOIL</u></b>				
B&W-S-1	Eastern Site Boundary - Ballfield	Soil	Annually	93
B&W-S-2	James River Riverside Park	Soil	Annually	93
<b><u>SURFACE WATER</u></b>				
B&W-W-1	Eastern Site Boundary - Ballfield	Surface Water	Annually	93
B&W-W-2	James River Riverside Park	Surface Water	Annually	93
<b><u>VEGETATION</u></b>				
B&W-V-1	Eastern Site Boundary - Ballfield	Grass	Annually	94
B&W-V-2	James River Riverside Park	Grass	Annually	94

# COMMONWEALTH OF VIRGINIA

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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: 01/01/18 – 01/08/18<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 MICL being serviced and the holiday, samples were not collected.

**Virginia Department of Health**  
**Week 2: 01/08/18 – 01/15/18<sup>4</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>4</sup> Due to the MICL being serviced, samples were not collected.

**Virginia Department of Health**  
**Week 3: 01/15/18 – 01/22/18<sup>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				
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>5</sup> Due to the MICL being serviced, samples were not collected.

**Virginia Department of Health**  
**Week 4: 01/22/18 – 01/29/18<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	NDR	NDR	NDR	0.02 +/- 0.003
SPS-A-2	NDR	NDR	NDR	0.03 +/- 0.004
PSP-A-1	NDR	NDR	NDR	0.02 +/- 0.003
NAPS-A-1	NDR	NDR	NDR	0.03 +/- 0.005
NAPS-A-2	NDR	NDR	NDR	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	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	NDR
SPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	NDR
SPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	NDR
NAPS-W-1 <sup>7</sup>	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	6757 +/- 407
NAPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	NDR
NAPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	150 +/- 100

<sup>6</sup> Due to the MICL being serviced, and holiday 01/15, air samples collected 01/16 – 01/29.

<sup>7</sup> Due to 2 of 8 circulating water intake pumps not being in service, water sample had elevated tritium level.

# Virginia Department of Health

## Week 5: 01/29/18 – 02/05/18

### 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	0.01 +/- 0.002
SPS-A-2	NDR	NDR	NDR	0.02 +/- 0.003
PSP-A-1	NDR	NDR	NDR	0.02 +/- 0.003
NAPS-A-1	NDR	NDR	NDR	0.03 +/- 0.004
NAPS-A-2	NDR	NDR	NDR	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 37	Ba 140	H3 Activity
SPS-W-1	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	526 +/- 122
SPS-W-2	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	375 +/- 100
SPS-W-3	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	300 +/- 100
NAPS-W-1 <sup>8</sup>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	6682 +/- 412
NAPS-W-2	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR
NAPS-W-3	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	1126 +/- 158

<sup>8</sup> Due to 2 of 8 circulating water intake pumps not being in service, water sample had elevated tritium level.

# Virginia Department of Health

## Week 6: 02/05/18 – 02/12/18

### 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	0.02 +/- 0.004
SPS-A-2	NDR	NDR	NDR	0.03 +/- 0.010
PSP-A-1	NDR	NDR	NDR	0.02 +/- 0.004
NAPS-A-1	NDR	NDR	NDR	0.03 +/- 0.010
NAPS-A-2	NDR	NDR	NDR	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	Gross Beta	H3 Activity
SPS-W-1	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		751 +/- 123
SPS-W-1 DCLS	<3.0	<5.0	<10	<5.0	<11	<9.0	<10	<5.0	<5.0	<28	64.7 +/- 10.7	
SPS-W-2	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
SPS-W-2 DCLS	<3.0	<3.0	<7.0	<3.0	<7.0	<6.0	<6.0	<3.0	<3.0	<16	6.4 +/- 1.1	
SPS-W-3	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
SPS-W-3 DCLS	<3.0	<3.0	<7.0	<3.0	<7.0	<6.0	<7.0	<3.0	<3.0	<18	13.3 +/- 1.1	
NAPS-W-1 <sup>9</sup>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		7508 +/- 425
NAPS-W-1 DCLS	<5.0	<5.0	<11	<5.0	<11	<9.0	<13	<5.0	<5.0	<33	3.0 +/- 0.9	
NAPS-W-2	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
NAPS-W-2 DCLS	<5.0	<5.0	<11	<5.0	<11	<10	<17	<5.0	<5.0	<39	8.4 +/- 1.2	
NAPS-W-3	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		NDR
NAPS-W-3 DCLS	<3.0	<3.0	<7.0	<3.0	<7.0	<6.0	<9.0	<3.0	<3.0	<21	9.3 +/- 1.2	

<sup>9</sup> Due to 2 of 8 circulating water intake pumps not being in service, water sample had elevated tritium level.

**Virginia Department of Health**  
**Week 7: 02/12/18 – 02/19/18<sup>10</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	0.02 +/- 0.003
SPS-A-2	NDR	NDR	NDR	0.03 +/- 0.005
PSP-A-1	NDR	NDR	NDR	0.02 +/- 0.004
NAPS-A-1	NDR	NDR	NDR	0.04 +/- 0.005
NAPS-A-2	NDR	NDR	NDR	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 37	Ba 140	H3 Activity
SPS-W-1	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	826 +/- 140
SPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	601 +/- 122
SPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	375 +/- 99
NAPS-W-1 <sup>11</sup>	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	6231 +/- 397
NAPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	375 +/- 99
NAPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	375 +/- 99

<sup>10</sup> Due to holiday, 02/19, samples were collected 02/20.

<sup>11</sup> Due to 2 of 8 circulating water intake pumps not being in service, water sample had elevated tritium level.



# Virginia Department of Health

## Week 8: 02/19/18 – 02/26/18<sup>12</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	0.02 +/- 0.004
SPS-A-2	NDR	NDR	NDR	0.03 +/- 0.004
PSP-A-1	NDR	NDR	NDR	0.04 +/- 0.010
NAPS-A-1	NDR	NDR	NDR	0.04 +/- 0.010
NAPS-A-2	NDR	NDR	NDR	0.03 +/- 0.010

### 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	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	901 +/- 141
SPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	150 +/- 71
SPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	3 +/- 300
NAPS-W-1 <sup>13</sup>	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	9835 +/- 484
NAPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	526 +/- 300
NAPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	526 +/- 100

<sup>12</sup> Due to training, 02/26, samples were collected 02/27.

<sup>13</sup> Due to Dominion Power Station release of the Boron Recovery Tank, Tritium level was elevated.

**Virginia Department of Health**  
**Week 9: 02/26/18 – 03/05/18 <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	NDR	NDR	NDR	0.04 +/- 0.004
SPS-A-2	NDR	NDR	NDR	0.04 +/- 0.004
PSP-A-1	NDR	NDR	NDR	0.05 +/- 0.005
NAPS-A-1	NDR	NDR	NDR	0.05 +/- 0.007
NAPS-A-2 <sup>15</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	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	450 +/- 122
SPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	300 +/- 100
SPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	3 +/- 100
NAPS-W-1 <sup>16</sup>	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	6156 +/- 399
NAPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	375 +/- 100
NAPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	375 +/- 100

<sup>14</sup> Due to training on 03/05, samples were collected 03/06.

<sup>15</sup> Due to air sampler being unplugged, sample was not collected.

<sup>16</sup> Due to Dominion Power Station release of the Boron Recovery Tank, Tritium level was elevated.

# Virginia Department of Health

## Week 10: 03/05/18 – 03/12/18

### 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	0.02 +/- 0.004
SPS-A-2	NDR	NDR	NDR	0.02 +/- 0.004
PSP-A-1	NDR	NDR	NDR	0.03 +/- 0.005
NAPS-A-1	NDR	NDR	NDR	0.05 +/- 0.007
NAPS-A-2	NDR	NDR	NDR	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	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	901 +/- 141
SPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	150 +/- 71
SPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	3 +/- 122
NAPS-W-1 <sup>17</sup>	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	6006 +/- 387
NAPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	150 +/- 71
NAPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	150 +/- 71

<sup>17</sup> Due to Dominion Power Station release of the Boron Recovery Tank, Tritium level was elevated.

**Virginia Department of Health**  
**Week 11: 03/12/18 – 03/19/18<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 the MICL being serviced, samples were not collected.

**Virginia Department of Health**  
**Week 12: 03/19/18 - 03/26/18<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											

<sup>19</sup> Due to the MICL being serviced, samples were not collected.

**Virginia Department of Health**  
**Week 13: 03/26/18 – 04/02/18<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											

<sup>20</sup> Due to the MICL being serviced, samples were not collected.

**Virginia Department of Health**  
**Week 14: 04/02/18 – 04/09/18**

**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	0.03 +/- 0.004
SPS-A-2	NDR	NDR	NDR	0.03 +/- 0.005
PSP-A-1	NDR	NDR	NDR	0.03 +/- 0.010
NAPS-A-1	NDR	NDR	NDR	0.04 +/- 0.010
NAPS-A-2	NDR	NDR	NDR	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	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	1051 +/- 158
SPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	NDR
SPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	3 +/- 245
NAPS-W-1 <sup>21</sup>	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	9159 +/- 464
NAPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	NDR
NAPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	NDR

<sup>21</sup> Due to Dominion Power Station refueling outage and the reduction of intake pumps, Tritium level was elevated.

**Virginia Department of Health**  
**Week 15: 04/09/18 – 04/16/18**

**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	0.03 +/- 0.004
SPS-A-2	NDR	NDR	NDR	0.04 +/- 0.005
PSP-A-1	NDR	NDR	NDR	0.03 +/- 0.005
NAPS-A-1	NDR	NDR	NDR	0.04 +/- 0.006
NAPS-A-2	NDR	NDR	NDR	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	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	901 +/- 158
SPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	300 +/- 100
SPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	3 +/- 122
NAPS-W-1 <sup>22</sup>	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	5781 +/- 387
NAPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	NDR
NAPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	225 +/- 71

<sup>22</sup> Due to Dominion Power Station refueling outage and the reduction of intake pumps, Tritium level was elevated.



**Virginia Department of Health**  
**Week 16: 04/16/18 – 04/23/18**

**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	0.03 +/- 0.005
SPS-A-2	NDR	NDR	NDR	0.04 +/- 0.006
PSP-A-1	NDR	NDR	NDR	0.04 +/- 0.006
NAPS-A-1	NDR	NDR	NDR	0.04 +/- 0.006
NAPS-A-2	NDR	NDR	NDR	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	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	601 +/- 123
SPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	75 +/- 224
SPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	3 +/- 71
NAPS-W-1 <sup>23</sup>	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	4880 +/- 361
NAPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	225 +/- 71
NAPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	676 +/- 123

<sup>23</sup> Due to Dominion Power Station refueling outage and the reduction of intake pumps, Tritium level was elevated.

**Virginia Department of Health**  
**Week 17: 04/23/18 – 04/30/18**

**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	0.03 +/- 0.005
SPS-A-2	NDR	NDR	NDR	0.03 +/- 0.005
PSP-A-1	NDR	NDR	NDR	0.03 +/- 0.005
NAPS-A-1	NDR	NDR	NDR	0.05 +/- 0.010
NAPS-A-2	NDR	NDR	NDR	0.03 +/- 0.010

**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>24</sup>	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	3904 +/- 300
SPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	75 +/- 255
SPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	NDR
NAPS-W-1 <sup>25</sup>	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	8183 +/- 442
NAPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	NDR
NAPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	NDR

<sup>24</sup> Due to a batch release at Dominion Surry Power Plant, Tritium level was elevated.

<sup>25</sup> Due to Dominion Power Station refueling outage and the reduction of intake pumps, Tritium level was elevated.

# Virginia Department of Health

## Week 18: 04/30/18 – 05/07/18

### 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	0.04 +/- 0.006
SPS-A-2	NDR	NDR	NDR	0.05 +/- 0.007
PSP-A-1	NDR	NDR	NDR	0.04 +/- 0.010
NAPS-A-1	NDR	NDR	NDR	0.06 +/- 0.010
NAPS-A-2	NDR	NDR	NDR	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	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	6006 +/- 380
SPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	150 +/- 71
SPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	3 +/- 141
NAPS-W-1 <sup>26</sup>	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	9159 +/- 463
NAPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	150 +/- 71
NAPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	526 +/- 122

<sup>26</sup> Due to Dominion Power Station refueling outage and the reduction of intake pumps, Tritium level was elevated.

**Virginia Department of Health**  
**Week 19: 05/07/18 – 05/14/18**

**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>
<b>SPS-A-1<sup>27</sup></b>				
<b>SPS-A-2</b>	NDR	NDR	NDR	0.04 +/- 0.006
<b>PSP-A-1</b>	NDR	NDR	NDR	0.05 +/- 0.007
<b>NAPS-A-1</b>	NDR	NDR	NDR	0.06 +/- 0.008
<b>NAPS-A-2</b>	NDR	NDR	NDR	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	Gross Beta	H3 Activity
<b>SPS-W-1</b>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		1276 +/- 173
<b>SPS-W-1 DCLS</b>	<5.0	<5.0	<9.0	<5.0	<11	<9.0	<7.0	<5.0	<5.0	<23	<69.9	
<b>SPS-W-2</b>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		601 +/- 122
<b>SPS-W-2 DCLS</b>	<3.0	<3.0	<7.0	<3.0	<7.0	<5.0	<4.0	<3.0	<3.0	<12	<6.4	
<b>SPS-W-3</b>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		3 +/- 122
<b>SPS-W-3 DCLS</b>	<3.0	<3.0	<7.0	<3.0	<7.0	<5.0	<5.0	<3.0	<3.0	<14	<6.4	
<b>NAPS-W-1<sup>28</sup></b>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		7958 +/- 429
<b>NAPS-W-1 DCLS</b>	<5.0	<5.0	<10	<5.0	<11	<9.0	<11	<5.0	<5.0	<31	<69.9	
<b>NAPS-W-2</b>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		601 +/- 122
<b>NAPS-W-2 DCLS</b>	<5.0	<5.0	<10	<5.0	<11	<9.0	<10	<5.0	<5.0	<29	<6.4	
<b>NAPS-W-3</b>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR		3453 +/- 282
<b>NAPS-W-3 DCLS</b>	<3.0	<3.0	<6.0	<3.0	<7.0	<6.0	<7.0	<3.0	<3.0	<17	<6.4	

<sup>27</sup> Due to the inability to access the SPS-A-1 location, air sample was not collected.

<sup>28</sup> Due to Dominion Power Station refueling outage and the reduction of intake pumps, Tritium level was elevated.

# Virginia Department of Health

## Week 20: 05/14/18 - 05/21/18

### 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	0.02 +/- 0.003
SPS-A-2 <sup>29</sup>				
PSP-A-1	NDR	NDR	NDR	0.02 +/- 0.004
NAPS-A-1	NDR	NDR	NDR	0.03 +/- 0.005
NAPS-A-2	NDR	NDR	NDR	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	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	2027 +/- 211
SPS-W-2 <sup>30</sup>											
SPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	601 +/- 211
NAPS-W-1 <sup>31</sup>	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	11111 +/- 428
NAPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	826 +/- 141
NAPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	1577 +/- 186

<sup>29</sup> Due to air sampler equipment malfunction, sample was not collected.

<sup>30</sup> Due to flooding, a sample could not be collected safely.

<sup>31</sup> Due to Dominion Power Station release of the Boron Recovery Tank, Tritium level was elevated.

**Virginia Department of Health**  
**Week 21: 05/21/18 – 05/28/18<sup>32</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	0.02 +/- 0.003
SPS-A-2 <sup>33</sup>				
PSP-A-1	NDR	NDR	NDR	0.03 +/- 0.004
NAPS-A-1	NDR	NDR	NDR	0.04 +/- 0.006
NAPS-A-2	NDR	NDR	NDR	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	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	676 +/- 122
SPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	NDR
SPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	225 +/- 70
NAPS-W-1	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	5105 +/- 428
NAPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	NDR
NAPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	1502 +/- 199

<sup>32</sup> Due to holiday, 05/28, sample was collected 05/29.

<sup>33</sup> Due to air sampler being serviced, sample was not collected.

# Virginia Department of Health

## Week 22: 05/28/18 – 06/04/18

### 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	0.01 +/- 0.003
SPS-A-2	NDR	NDR	NDR	0.02 +/- 0.008
PSP-A-1	NDR	NDR	NDR	0.02 +/- 0.003
NAPS-A-1	NDR	NDR	NDR	0.02 +/- 0.004
NAPS-A-2	NDR	NDR	NDR	0.01 +/- 0.002

### 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	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	1727 +/- 199
SPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	NDR
SPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	3 +/- 122
NAPS-W-1 <sup>34</sup>	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	5931 +/- 386
NAPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	1126 +/- 158
NAPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	150 +/- 71

<sup>34</sup> Due to Dominion Power Station refueling outage and the reduction of intake pumps, Tritium level was elevated

**Virginia Department of Health**  
**Week 23: 06/04/18 - 06/11/18<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 the MICL being serviced, samples were not collected.



**Virginia Department of Health**  
**Week 24: 06/11/18 – 06/18/18<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 the MICL being serviced, samples were not collected.

**Virginia Department of Health**  
**Week 25: 06/18/18 – 06/25/18<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				
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>37</sup> Due to the MICL being serviced, samples were not collected.

# Virginia Department of Health

## Week 26: 06/25/18 - 07/02/18

### 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 +/- 0.010
SPS-A-2	NDR	NDR	NDR	0.06 +/- 0.010
PSP-A-1	NDR	NDR	NDR	0.06 +/- 0.010
NAPS-A-1	NDR	NDR	NDR	0.12 +/- 0.020
NAPS-A-2	NDR	NDR	NDR	0.12 +/- 0.020

### 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	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	225 +/- 70
SPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	NDR
SPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	NDR
NAPS-W-1	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	6907 +/- 397
NAPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	NDR
NAPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	2477 +/- 243

# Virginia Department of Health

## Week 27: 07/02/18 – 07/09/18

### 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	0.03 +/- 0.004
SPS-A-2	NDR	NDR	NDR	0.05 +/- 0.007
PSP-A-1	NDR	NDR	NDR	0.06 +/- 0.008
NAPS-A-1	NDR	NDR	NDR	0.08 +/- 0.011
NAPS-A-2	NDR	NDR	NDR	0.12 +/- 0.016

### 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	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	225 +/- 71
SPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	150 +/- 71
SPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	NDR
NAPS-W-1	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	5856 +/- 374
NAPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	225 +/- 71
NAPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	2778 +/- 264

**Virginia Department of Health**  
**Week 28: 07/09/18 – 07/16/18<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				
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>38</sup> Due to the North Anna Power Station Graded Exercise, no samples were collected.

**Virginia Department of Health**  
**Week 29: 07/16/18 – 07/23/18<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				
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>39</sup> Due to the North Anna Power Station Graded Exercise, no samples were collected.

**Virginia Department of Health**  
**Week 30: 07/23/19 – 07/30/18**

## 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	0.02 +/- 0.004
SPS-A-2	NDR	NDR	NDR	0.05 +/- 0.007
PSP-A-1	NDR	NDR	NDR	0.05 +/- 0.007
NAPS-A-1	NDR	NDR	NDR	0.09 +/- 0.013
NAPS-A-2	NDR	NDR	NDR	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	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	NDR
SPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	75 +/- 222
SPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	NDR
NAPS-W-1	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	3303 +/- 289
NAPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	751 +/- 222
NAPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	2853 +/- 263

**Virginia Department of Health**  
**Week 31: 07/30/18 – 08/06/18**

**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	0.04 +/- 0.010
SPS-A-2	NDR	NDR	NDR	0.07 +/- 0.010
PSP-A-1	NDR	NDR	NDR	0.05 +/- 0.010
NAPS-A-1	NDR	NDR	NDR	0.10 +/- 0.010
NAPS-A-2	NDR	NDR	NDR	0.11 +/- 0.010

**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	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	375 +/- 100
SPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	NDR
SPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	976 +/- 158
NAPS-W-1	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	4204 +/- 323
NAPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	450 +/- 100
NAPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	2778 +/- 264



**Virginia Department of Health**  
**Week 32: 08/06/18 – 08/13/18**

**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	0.03 +/- 0.005
SPS-A-2	NDR	NDR	NDR	0.05 +/- 0.010
PSP-A-1	NDR	NDR	NDR	0.05 +/- 0.010
NAPS-A-1	NDR	NDR	NDR	0.10 +/- 0.010
NAPS-A-2	NDR	NDR	NDR	0.07 +/- 0.010

**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	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	75 +/- 212
SPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	300 +/- 100
SPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	75 +/- 212
NAPS-W-1	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	4505 +/- 324
NAPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	NDR
NAPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	3529 +/- 283

**Virginia Department of Health**  
**Week 33: 08/13/18 – 08/20/18<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	NDR	NDR	NDR	0.03 +/- 0.005
SPS-A-2	NDR	NDR	NDR	0.06 +/- 0.010
PSP-A-1	NDR	NDR	NDR	0.06 +/- 0.010
NAPS-A-1 <sup>41</sup>				
NAPS-A-2	NDR	NDR	NDR	0.07 +/- 0.010

**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	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	375 +/- 100
SPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	225 +/- 71
SPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	375 +/- 100
NAPS-W-1	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	3604 +/- 300
NAPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	225 +/- 71
NAPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	3604 +/- 283

<sup>40</sup> Starting in the 3<sup>rd</sup> quarter of 2018 submission of duplicate water samples to DCLS was discontinued.

<sup>41</sup> Due to the electrical breaker trip, no air sample was collected.

**Virginia Department of Health**  
**Week 34: 08/20/18 – 08/27/18**

**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 +/- 0.007
SPS-A-2	NDR	NDR	NDR	0.09 +/- 0.013
PSP-A-1	NDR	NDR	NDR	0.08 +/- 0.011
NAPS-A-1	NDR	NDR	NDR	0.01 +/- 0.002
NAPS-A-2	NDR	NDR	NDR	0.12 +/- 0.015

**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	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	225 +/- 70
SPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	150 +/- 70
SPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	150 +/- 70
NAPS-W-1	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	3453 +/- 290
NAPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	225 +/- 70
NAPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	2553 +/- 254

**Virginia Department of Health**  
**Week 35: 08/27/18 - 09/03/18**

**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	0.04 +/- 0.010
SPS-A-2	NDR	NDR	NDR	0.09 +/- 0.010
PSP-A-1	NDR	NDR	NDR	0.09 +/- 0.010
NAPS-A-1	NDR	NDR	NDR	0.12 +/- 0.020
NAPS-A-2	NDR	NDR	NDR	0.15 +/- 0.020

**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	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	751 +/- 141
SPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	150 +/- 71
SPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	150 +/- 71
NAPS-W-1	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	4880 +/- 338
NAPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	225 +/- 71
NAPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	2703 +/- 254

**Virginia Department of Health**  
**Week 36: 09/04/18 – 09/10/18**

**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	0.03 +/- 0.005
SPS-A-2	NDR	NDR	NDR	0.06 +/- 0.008
PSP-A-1	NDR	NDR	NDR	0.04 +/- 0.006
NAPS-A-1	NDR	NDR	NDR	0.05 +/- 0.007
NAPS-A-2	NDR	NDR	NDR	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 <sup>42</sup>											
SPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	150 +/- 71
SPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	150 +/- 71
NAPS-W-1	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	3078 +/- 282
NAPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	225 +/- 71
NAPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	2553 +/- 254

<sup>42</sup> Due to flooding, no sample was collected

# Virginia Department of Health

## Week 37: 09/10/18 – 09/17/18

### 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	0.02 +/- 0.003
SPS-A-2	NDR	NDR	NDR	0.03 +/- 0.004
PSP-A-1	NDR	NDR	NDR	0.03 +/- 0.004
NAPS-A-1	NDR	NDR	NDR	0.03 +/- 0.004
NAPS-A-2	NDR	NDR	NDR	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	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	1652 +/- 199
SPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	150 +/- 70
SPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	1727 +/- 199
NAPS-W-1	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	3979 +/- 315
NAPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	75 +/- 223
NAPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	2778 +/- 263

# Virginia Department of Health

## Week 38: 09/17/18 – 09/24/18

### 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	0.03 +/- 0.004
SPS-A-2	NDR	NDR	NDR	0.04 +/- 0.010
PSP-A-1	NDR	NDR	NDR	0.03 +/- 0.005
NAPS-A-1	NDR	NDR	NDR	0.04 +/- 0.010
NAPS-A-2	NDR	NDR	NDR	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	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	1426 +/- 186
SPS-W-2 <sup>43</sup>											
SPS-W-3	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	826 +/- 141
NAPS-W-1 <sup>44</sup>	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	6006 +/- 378
NAPS-W-2	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	826 +/- 141
NAPS-W-3	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	1877 +/- 211

<sup>43</sup> Due to flooding, no sample was collected.

<sup>44</sup> Due to Dominions release of Boron Recovery Tank, tritium level was elevated.

**Virginia Department of Health**  
**Week 39: 09/24/18 – 10/01/18**

**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 +/- 0.007
SPS-A-2	NDR	NDR	NDR	0.06 +/- 0.010
PSP-A-1	NDR	NDR	NDR	0.06 +/- 0.009
NAPS-A-1	NDR	NDR	NDR	0.06 +/- 0.010
NAPS-A-2	NDR	NDR	NDR	0.08 +/- 0.011

**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	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	676 +/- 123
SPS-W-2 <sup>45</sup>											
SPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	375 +/- 302
NAPS-W-1	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	3679 +/- 71
NAPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	225 +/- 225
NAPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	2102 +/- 213

<sup>45</sup> Due to the elevated water, mud and safety, sample was not collected



**Virginia Department of Health**  
**Week 40: 10/01/18 – 10/08/18**

**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 +/- 0.007
SPS-A-2	NDR	NDR	NDR	0.06 +/- 0.010
PSP-A-1	NDR	NDR	NDR	0.07 +/- 0.010
NAPS-A-1	NDR	NDR	NDR	0.08 +/- 0.010
NAPS-A-2	NDR	NDR	NDR	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	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	150 +/- 71
SPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	NDR
SPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	150 +/- 71
NAPS-W-1	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	2928 +/- 274
NAPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	150 +/- 71
NAPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	2778 +/- 264

# Virginia Department of Health

## Week 41: 10/08/18 – 10/15/18

### 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	0.04 +/- 0.010
SPS-A-2	NDR	NDR	NDR	0.08 +/- 0.010
PSP-A-1	NDR	NDR	NDR	0.06 +/- 0.010
NAPS-A-1	NDR	NDR	NDR	0.07 +/- 0.010
NAPS-A-2 <sup>46</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	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	526 +/- 123
SPS-W-2 <sup>47</sup>											
SPS-W-3	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR
NAPS-W-1	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	4505 +/- 375
NAPS-W-2	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	225 +/- 71
NAPS-W-3	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	901 +/- 142

<sup>46</sup> Due to Hurricane Michael, the electrical breaker had tripped, sample was not collected.

<sup>47</sup> Due to the storm, flooding compromised safety, sample was not collected.

# Virginia Department of Health

## Week 42: 10/15/18 – 10/22/18

### 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	0.03 +/- 0.005
SPS-A-2	NDR	NDR	NDR	0.07 +/- 0.009
PSP-A-1	NDR	NDR	NDR	0.06 +/- 0.009
NAPS-A-1	NDR	NDR	NDR	0.07 +/- 0.010
NAPS-A-2	NDR	NDR	NDR	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	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	1351 +/- 173
SPS-W-2	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR
SPS-W-3	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	375 +/- 100
NAPS-W-1	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	3378 +/- 291
NAPS-W-2	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	375 +/- 100
NAPS-W-3	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	976 +/- 158

**Virginia Department of Health**  
**Week 43: 10/22/18 – 10/29/18**

**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	0.02 +/- 0.004
SPS-A-2	NDR	NDR	NDR	0.04 +/- 0.006
PSP-A-1	NDR	NDR	NDR	0.03 +/- 0.005
NAPS-A-1	NDR	NDR	NDR	0.05 +/- 0.007
NAPS-A-2	NDR	NDR	NDR	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	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	225 +/- 71
SPS-W-2	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR
SPS-W-3	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	225 +/- 71
NAPS-W-1	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	3153 +/- 284
NAPS-W-2	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR
NAPS-W-3	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	NDR	526 +/- 100

**Virginia Department of Health**  
**Week 44: 10/29/18 – 11/05/18**

**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	0.03 +/- 0.004
SPS-A-2	NDR	NDR	NDR	0.05 +/- 0.010
PSP-A-1	NDR	NDR	NDR	0.03 +/- 0.010
NAPS-A-1	NDR	NDR	NDR	0.05 +/- 0.010
NAPS-A-2	NDR	NDR	NDR	0.04 +/- 0.010

**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>48</sup>	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	7057 +/- 406
SPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	NDR
SPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	NDR
NAPS-W-1	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	3453 +/- 283
NAPS-W-2 <sup>49</sup>											
NAPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	NDR

<sup>48</sup> Due to multiple batch releases, tritium level was elevated.

<sup>49</sup> Due to flooding and road closure, sample was not collected.

**Virginia Department of Health**  
**Week 45: 11/05/18 – 11/12/18**

**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	0.02 +/- 0.004
SPS-A-2	NDR	NDR	NDR	0.04 +/- 0.006
PSP-A-1	NDR	NDR	NDR	0.03 +/- 0.005
NAPS-A-1	NDR	NDR	NDR	0.05 +/- 0.007
NAPS-A-2	NDR	NDR	NDR	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	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	4354 +/- 323
SPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	NDR
SPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	NDR
NAPS-W-1	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	3078 +/- 273
NAPS-W-2 <sup>50</sup>											
NAPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	NDR

<sup>50</sup> Due to flooding and road closure, sample was not collected.

**Virginia Department of Health**  
**Week 46: 11/12/18 – 11/19/18<sup>51</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>51</sup> Due to Thanksgiving Holiday, water samples were not collected, air samples will collect for two weeks.

**Virginia Department of Health**  
**Week 47: 11/19/18 – 11/26/18<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	NDR	NDR	NDR	0.03 +/- 0.004
SPS-A-2	NDR	NDR	NDR	0.05 +/- 0.006
PSP-A-1	NDR	NDR	NDR	0.03 +/- 0.004
NAPS-A-1	NDR	NDR	NDR	0.05 +/- 0.006
NAPS-A-2	NDR	NDR	NDR	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	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	1051 +/- 158
SPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	NDR
SPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	450 +/- 100
NAPS-W-1	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	4204 +/- 324
NAPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	150 +/- 71
NAPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	526 +/- 100

<sup>52</sup> Due to Veteran's Day and Thanksgiving Holidays, air samples were collected from 11/13 – 11/26, water sampler collection 11/19 – 11/26.



**Virginia Department of Health**  
**Week 48: 11/26/18 – 12/03/18**

**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	0.03 +/- 0.004
SPS-A-2	NDR	NDR	NDR	0.05 +/- 0.010
PSP-A-1	NDR	NDR	NDR	0.05 +/- 0.010
NAPS-A-1	NDR	NDR	NDR	0.05 +/- 0.010
NAPS-A-2	NDR	NDR	NDR	0.04 +/- 0.010

**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	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	2477 +/- 235
SPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	75 +/- 224
SPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	225 +/- 71
NAPS-W-1	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	4730 +/- 332
NAPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	150 +/- 71
NAPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	75 +/- 224

**Virginia Department of Health**  
**Week 49: 12/03/08 – 12/10/18<sup>53</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>53</sup> Due to a winter storm and closed offices, samples were not collected.

# Virginia Department of Health

## Week 50: 12/10/18 – 12/17/18

### 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	0.02 +/- 0.004
SPS-A-2	NDR	NDR	NDR	0.03 +/- 0.005
PSP-A-1	NDR	NDR	NDR	0.03 +/- 0.004
NAPS-A-1	NDR	NDR	NDR	0.04 +/- 0.005
NAPS-A-2	NDR	NDR	NDR	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	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	375 +/- 100
SPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	150 +/- 71
SPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	150 +/- 71
NAPS-W-1	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	3003 +/- 274
NAPS-W-2	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	NDR
NAPS-W-3	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	N D R	225 +/- 71

**Virginia Department of Health**  
**Week 51: 12/17/18 - 12/24/18<sup>54</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>54</sup> Due to the holiday, 12/24 & 12/25, samples were not collected.

**Virginia Department of Health**  
**Week 52: 12/24/18 – 12/31/18<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				
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>55</sup> Due to the holidays, 12/24 & 12/25, samples were not collected.

# Virginia Department of Health

## SURFACE WATER

January 1, 2018 through December 31, 2018

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

Qtr.	Date collected	Gamma Activity – pCi/liter						Gross Beta pCi/liter
		Ba-140	Cs-137	I-131	Mn-54	Zn-65	Zr95/Nb95	
1st	03/29/18 <sup>56</sup>							
2nd	06/19/18	<21.0	<5.0	<6.0	<5.0	<11.0	<9.0	126.5±14.2
3rd	09/26/18 <sup>57</sup>							
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						Gross Beta pCi/liter
		Ba-140	Cs-137	I-131	Mn-54	Zn-65	Zr95/Nb95	
1st	03/29/18 <sup>58</sup>							
2nd	06/19/18	<26.0	<5.0	<9.0	<5.0	<11.0	<9.0	122.5±14.3
3rd	09/26/18 <sup>59</sup>							
4th	11/29/18	NDR	NDR	NDR	NDR	NDR	NDR	N/A

<sup>56</sup> Water sample was rejected by Division of Consolidated Lab Services.

<sup>57</sup> Due to NNSY boat mechanical issue, sample was not collected.

<sup>58</sup> Water sample was rejected by Division of Consolidated Lab Services.

<sup>59</sup> Due to NNSY boat mechanical issue, sample was not collected.

# Virginia Department of Health

## SURFACE WATER

January 1, 2018 through December 31, 2018

### Norfolk Naval Shipyard

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

Qtr.	Date collected	Gamma Activity – pCi/liter					
	03/28/18 <sup>60</sup>						
		Ba-140	Cs-137	I-131	Mn-54	Zn-65	Zr95/Nb95
1st							
Gross Beta							
	06/19/18						
		Ba-140	Cs-137	I-131	Mn-54	Zn-65	Zr95/Nb95
2nd		<11.0	<3.0	<3.0	<3.0	<8.0	<6.0
Gross Beta		163.3±16.7					
	09/26/18						
		Ba-140	Cs-137	I-131	Mn-54	Zn-65	Zr95/Nb95
3rd		NDR	NDR	NDR	NDR	NDR	NDR
	11/26/18						
		Ba-140	Cs-137	I-131	Mn-54	Zn-65	Zr95/Nb95
4th		NDR	NDR	NDR	NDR	NDR	NDR

# Virginia Department of Health

## SURFACE WATER

<sup>60</sup> Water sample was rejected by Division of Consolidated Lab Services

January 1, 2018 through December 31, 2018

## Norfolk Naval Shipyard

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

Qtr.	Date collected	Gamma Activity – pCi/liter					
	03/29/18 <sup>61</sup>						
		Ba-140	Cs-137	I-131	Mn-54	Zn-65	Zr95/Nb95
1st							
Gross Beta							
	06/19/18						
		Ba-140	Cs-137	I-131	Mn-54	Zn-65	Zr95/Nb95
2nd		<15.0	<3.0	<5.0	<3.0	<7.0	<3.0
Gross Beta		156.7±16.1					
	09/26/18						
		Ba-140	Cs-137	I-131	Mn-54	Zn-65	Zr95/Nb95
3rd		NDR	NDR	NDR	NDR	NDR	NDR
	11/29/18						
		Ba-140	Cs-137	I-131	Mn-54	Zn-65	Zr95/Nb95
4th		NDR	NDR	NDR	NDR	NDR	NDR

<sup>61</sup> Water sample was rejected by Division of Consolidated Lab Services



# Virginia Department of Health SURFACE WATER

January 1, 2018 through December 31, 2018

## Norfolk Naval Shipyard

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

Qtr.	Date collected	Gamma Activity – pCi/liter				
	03/29/18 <sup>62</sup>					
		Ba-140	Cs-137	I-131	Mn-54	Zn-65
						Zr95/Nb95
<b>1st</b>						
<b>Gross Beta</b>						
	06/19/18					
		Ba-140	Cs-137	I-131	Mn-54	Zn-65
						Zr95/Nb95
<b>2nd</b>		<15.0	<3.0	<5.0	<3.0	<7.0
						<5.0
<b>Gross Beta</b>		156.1±15.5				
	09/26/18					
		Ba-140	Cs-137	I-131	Mn-54	Zn-65
						Zr95/Nb95
<b>3rd</b>		NDR	NDR	NDR	NDR	NDR
	11/29/18					
<b>4rd</b>		Ba-140	Cs-137	I-131	Mn-54	Zn-65
						Zr95/Nb95
		NDR	NDR	NDR	NDR	NDR

<sup>62</sup> Water sample was rejected by Division of Consolidated Lab Services.

# Virginia Department of Health SILT

January 1, 2018 through December 31, 2018

## Newport News Shipbuilder

Location	Date Collected	Gamma Activity pCi/gram			
James River – Pier 1  NNSB-S-1	03/29/18	<b>Cs-134</b> < 0.01	<b>Cs-137</b> 0.01 ± 0.01	<b>Co-58</b> < 0.01	<b>Co-60</b> < 0.01
James River – Pier 1  NNSB-S-1	06/19/18	<b>Cs-134</b> < 0.01	<b>Cs-137</b> 0.01 ± 0.01	<b>Co-58</b> < 0.01	<b>Co-60</b> < 0.01
James River – Pier 1  NNSB-S-1	09/26/18 <sup>63</sup>	<b>Cs-134</b>	<b>Cs-137</b>	<b>Co-58</b>	<b>Co-60</b>
James River – Pier 1  NNSB-S-1	11/29/18	<b>Cs-134</b> NDR	<b>Cs-137</b> NDR	<b>Co-58</b> NDR	<b>Co-60</b> NDR

<sup>63</sup> Due to NNSY's boat mechanical issue, sample was not collected.

# Virginia Department of Health SILT

January 1, 2018 through December 31, 2018

## Newport News Shipbuilder

Location	Date Collected	Gamma Activity pCi/gram			
James River – Shipway 11  NNSB-S-2	03/29/18	<b>Cs-134</b>	<b>Cs-137</b>	<b>Co-58</b>	<b>Co-60</b>
		< 0.01	0.03 ± 0.01	< 0.01	< 0.01
James River – Shipway 11  NNSB-S-2	06/19/18	<b>Cs-134</b>	<b>Cs-137</b>	<b>Co-58</b>	<b>Co-60</b>
		< 0.01	0.02 ± 0.01	< 0.01	< 0.01
James River – Shipway 11  NNSB-S-2	09/26/18 <sup>64</sup>	<b>Cs-134</b>	<b>Cs-137</b>	<b>Co-58</b>	<b>Co-60</b>
James River – Shipway 11  NNSB-S-2	11/29/18	<b>Cs-134</b>	<b>Cs-137</b>	<b>Co-58</b>	<b>Co-60</b>
		NDR	NDR	NDR	NDR

<sup>64</sup> Due to NNSY's boat mechanical issue, sample was not collected.

# Virginia Department of Health SILT

January 1, 2018 through December 31, 2018

## Norfolk Naval Shipyard

Location	Date Collected	Gamma Activity pCi/gram			
Elizabeth River Drydock #4	03/28/18				
NNSY-S-1	<b>Cs134</b>	<b>Cs137</b>	<b>Co58</b>	<b>Co60</b>	
	< 0.01	0.02 ± 0.01	< 0.01	< 0.01	
Elizabeth River Drydock #4	06/19/18				
NNSY-S-1	<b>Cs134</b>	<b>Cs137</b>	<b>Co58</b>	<b>Co60</b>	
	< 0.01	0.02 ± 0.01	< 0.01	< 0.01	
Elizabeth River Drydock #4	09/26/18				
NNSY-S-1	<b>Cs134</b>	<b>Cs137</b>	<b>Co58</b>	<b>Co60</b>	
	NDR	.0221	NDR	NDR	
Elizabeth River Drydock #4	11/29/18				
NNSY-S-1	<b>Cs134</b>	<b>Cs137</b>	<b>Co58</b>	<b>Co60</b>	
	NDR	NDR	NDR	NDR	

# Virginia Department of Health SILT

January 1, 2018 through December 31, 2018

## Norfolk Naval Shipyard

Location	Date Collected	Gamma Activity pCi/gram			
Elizabeth River Drydock #8	03/28/18				
NNSY-S-2	<b>Cs134</b>	<b>Cs137</b>	<b>Co58</b>	<b>Co60</b>	
	< 0.01	0.02 ± 0.01	< 0.01	< 0.01	
Elizabeth River Drydock #8	06/19/18				
NNSY-S-2	<b>Cs134</b>	<b>Cs137</b>	<b>Co58</b>	<b>Co60</b>	
	< 0.01	0.02 ± 0.01	< 0.01	< 0.01	
Elizabeth River Drydock #8	09/20/18				
NNSY-S-2	<b>Cs134</b>	<b>Cs137</b>	<b>Co58</b>	<b>Co60</b>	
	NDR	.0301	NDR	NDR	
Elizabeth River Drydock #8	11/29/18				
NNSY-S-2	<b>Cs134</b>	<b>Cs137</b>	<b>Co58</b>	<b>Co60</b>	
	NDR	NDR	NDR	NDR	

January 1, 2018 through December 31, 2018

Location	Date Collected	Gamma Activity			
		pCi/gram			
Elizabeth River Wet Slip #1	03/28/18				
NNSY-S-3	Cs134	Cs137	Co58	Co60	
	< 0.01	0.03 ± 0.01	< 0.01	< 0.01	
Elizabeth River Drydock #8	06/19/18				
NNSY-S-3	Cs134	Cs137	Co58	Co60	
	< 0.01	0.02 ± 0.01	< 0.01	< 0.01	
Elizabeth River Drydock #8	09/20/18				
NNSY-S-3	Cs134	Cs137	Co58	Co60	
	NDR	NDR	NDR	NDR	
Elizabeth River Drydock #8	11/29/18				
NNSY-S-3	Cs134	Cs137	Co58	Co60	
	NDR	.0256	NDR	NDR	

# Virginia Department of Health SILT

January 1, 2018 through December 31, 2018

## 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	02/05/18	<0.01 pCi/g	<0.01 pCi/g	<0.01 pCi/g	<0.01 pCi/g
		Cs-134	Cs-137	Co-58	Co-60
3rd	08/06/18	<0.01 pCi/g	<0.01 pCi/g	<0.01 pCi/g	<0.01 pCi/g

## 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	04/12/18	<0.01 pCi/g	<0.01 pCi/g	<0.01 pCi/g	<0.01 pCi/g
		Cs-134	Cs-137	Co-58	Co-60
4th	11/01/18 <sup>65</sup>	NDR	NDR	NDR	NDR

Note: Silt samples are collected bi-annually.

<sup>65</sup> NAPS-S-1 sample was counted at VDH-ORH Laboratory and all future NAPS-S-1 samples will be analyzed at VDH-ORH Laboratory.

# Virginia Department of Health

## FISH

January 1, 2018 through December 31, 2018

### Dominion Nuclear Power Station

Location Type of fish	Date Collected	Isotope	pCi/gram
North Anna 2 <sup>nd</sup> Cooling Lagoon	04/18/18	Ba-140	<0.05 pCi/g
		Cs-134	<0.01 pCi/g
		Cs-137	0.01 +/- 0.01 pCi/g
		Co-58	<0.01 pCi/g
		Co-60	<0.01 pCi/g
		I-131	<0.02 pCi/g
		Fe-59	<0.01 pCi/g
		Mn-54	<0.01 pCi/g
		Ru-106	<0.05 pCi/g
		Ag-110M	<0.01 pCi/g
NAPS- F-1 (Fish)		Zn-65	<0.01 pCi/g
		Nb-95	<0.01 pCi/g
Surry Discharge Canal	04/23/18	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	<0.04 pCi/g
		Fe-59	<0.02 pCi/g
		Mn-54	<0.01 pCi/g
		Ru-106	<0.05 pCi/g
		Ag-110M	<0.01 pCi/g
SPS-F-1 (Fish)		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, 2018 through December 31, 2018

## Dominion Nuclear Power Station

Location Type of fish	Date Collected	Isotope	pCi/gram
North Anna 4th Cooling Lagoon	10/17/18	Ba-140	<0.06 pCi/g
		Cs-134	<0.01 pCi/g
		Cs-137	0.01 +/- 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	<0.04 pCi/g
		Ag-110M	<0.01 pCi/g
NAPS- F-1 (Fish)		Zn-65	<0.01 pCi/g
		Nb-95	<0.01 pCi/g
Surry Discharge Canal	10/09/18	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
		I-131	<0.04 pCi/g
		Fe-59	<0.01 pCi/g
		Mn-54	<0.01 pCi/g
		Ru-106	<0.04 pCi/g
		Ag-110M	<0.01 pCi/g
SPS-F-1 (Fish)		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, 2018 through December 31, 2018

## Dominion Nuclear Power Station

Location Type of fish	Date Collected	Isotope	pCi/gram
Surry Power Station	04/23/18	Ba-140	<0.16 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	<0.16 pCi/g
(Clams and Oysters)		Fe-59	<0.02 pCi/g
		Mn-54	<0.01 pCi/g
		Ru-106	<0.05 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, 2018 through December 31, 2018

Surry County - Epps Dairy SPS-M-1 1st Quarter Date:01/09/18		
Isotope	Results - pCi/liter	
Ba-140	< 12.0 pCi/L	
Cs-134	< 3.0 pCi/L	
Cs-137	< 4.0 pCi/L	
K-40*	1.6 +/- 0.1 g/L	
I-131	< 3.0 pCi/L	
Sr-89	< 4.0 pCi/L	
Sr-90	< 0.5 pCi/L	
Surry County - Epps Dairy SPS-M-1 2nd Quarter Date: 04/02/2018		
Isotope	Results - pCi/liter	
Ba-140	< 20.0 pCi/L	
Cs-134	< 5.0 pCi/L	
Cs-137	< 4.0 pCi/L	
K-40	1.5 ± 0.1 g/L	
I-131	< 6.0 pCi/L	
Sr-89	< 4.0 pCi/L	
Sr-90	<0.4 pCi/L	
Surry County - Epps Dairy SPS-M-1 3rd Quarter Date: 07/02/2018		
Isotope	Results - pCi/liter	
Ba-140	< 12.0 pCi/L	
Cs-134	< 3.0 pCi/L	
Cs-137	< 4.0 pCi/L	
K-40	1.5 ± 0.1 g/L	
I-131	< 4.0 pCi/L	
Sr-89	< 4.0 pCi/L	
Sr-90	<0.71 ± 0.1 pCi/L	

# Virginia Department of Health

## Milk

January 1, 2018 through December 31, 2018

Surry County - Epps Dairy		
SPS-M-1		
4th Quarter Date: 10/04/18		
Isotope	Results - pCi/liter	
Ba-140	< 25.0 pCi/L	
Cs-134	< 5.0 pCi/L	
Cs-137	< 6.0 pCi/L	
K-40*	1.6 +/- 0.1 g/L	
I-131	< 8.0 pCi/L	
Sr-89	< 4.0 pCi/L	
Sr-90	0.44 +/- 0.3 g/L	

## **Virginia Department of Health Milk**

### **Louisa County Lake Side Dairy NAPS-M-1**

Lake Side Dairy is no longer in operation. There are no longer any dairy farms located within the 10 mile EPZ for milk sampling.

# Virginia Department of Health

## VEGETATION

January 1, 2018 through December 31, 2018

Location	Date collected	Type	Isotope	Results pCi/Gram (wet weight)
<b>Surry County</b>	<b>04/25/18</b>			
<b>Private garden</b>		Mixed Greens	I-131	<0.01
<b>SPS-V-1</b>			Cs-134	<0.01
			Cs-137	<0.01
<b>Louisa County</b>	<b>04/23/18</b>			
<b>Private Garden</b>		Mixed Greens	I-131	<0.01
<b>NAPS-V-1</b>			Cs-134	<0.01
			Cs-137	<0.01
<b>Surry County</b>	<b>11/30/18<sup>66</sup></b>			
<b>Private garden</b>		Mixed Greens	I-131	NDR
<b>SPS-V-1</b>			Cs-134	NDR
			Cs-137	NDR
<b>Louisa County</b>	<b>11/29/18<sup>67</sup></b>			
<b>Private Garden</b>		Mixed Greens	I-131	NDR
<b>NAPS-V-1</b>			Cs-134	NDR
			Cs-137	NDR

Note: Vegetation is collected bi-annually when available.

<sup>66</sup> SPS-V-1 sample was counted at VDH-ORH Laboratory and all future SPS-V-1 samples will be analyzed at VDH-ORH Laboratory.

<sup>67</sup> NAPS-V-1 sample was counted at VDH-ORH Laboratory and all future NAPS-V-1 samples will be analyzed at VDH-ORH Laboratory.

# Virginia Department of Health

## AMBIENT GAMMA EXPOSURE

November 6, 2018 through February 5, 2018

### FIRST QUARTER

Location	Station	Net Exposure Rate mR/Std Qtr +/- 2S.D.		
Jamestown – Historical site	SPS-D-1	30.60	+/-	11.06
Williamsburg – Airport	SPS-D-2	22.44	+/-	9.47
Williamsburg – Busch Gardens	SPS-D-3	31.68	+/-	11.26
Newport News - Lee Hall	SPS-D-4	33.29	+/-	11.54
Naval Weapons Station – 1	SPS-D-5	23.15	+/-	9.62
Newport News – Fort Eustis	SPS-D-6	28.14	+/-	10.61
Surry – Route 628	SPS-D-7	27.34	+/-	10.46
Surry – Lawnes Creek	SPS-D-8	30.11	+/-	10.97
Surry Power Station	SPS-D-9	26.66	+/-	10.33
Surry – Hog Point	SPS-D-10	25.54	+/-	9.91
Surry – Bacon's Castle	SPS-D-11	23.28	+/-	9.65
Surry – Alliance	SPS-D-12	27.24	+/-	10.49
Surry – Scotland Wharf	SPS-D-13	25.21	+/-	10.04
Surry – Lebanon Baptist Church	SPS-D-14	24.14	+/-	9.83
Louisa County - Mineral	NAPS-D-1	26.66	+/-	10.33
Louisa County – Wares Crossroads	NAPS-D-2	27.11	+/-	10.41
Louisa County – Good Hope Church	NAPS-D-3	31.03	+/-	11.14
Spotsylvania – Route 713	NAPS-D-4	27.38	+/-	10.47
Spotsylvania Route 614	NAPS-D-5	26.44	+/-	10.28
Spotsylvania – Levy	NAPS-D-6	31.14	+/-	11.16
Louisa County – Bumpass Fire Dept.	NAPS-D-7	38.93	+/-	10.76
Louisa County – Fred Hall	NAPS-D-8	24.14	+/-	9.83
Louisa County – Aspen Hill	NAPS-D-9	33.69	+/-	11.61
Louisa County – Route 685	NAPS-D-10	27.11	+/-	10.41
Louisa County – Route 700	NAPS-D-11	33.51	+/-	11.58
North Anna Power Station	NAPS-D-12	30.80	+/-	11.10
Pocahontas State Park (Control)	PSP-D-1	42.70	+/-	13.07
Radiological Health	ORH-D-1	15.05	+/-	7.76
Radiological Health	ORH-D-2	14.38	+/-	7.583

# Virginia Department of Health

## AMBIENT GAMMA EXPOSURE

February 5, 2018 through May 7, 2018

### SECOND QUARTER

Location	Station	Net Exposure Rate mR/Std Qtr +/- 2S.D.		
Jamestown – Historical site	SPS-D-1	23.55	+/-	9.70
Williamsburg – Airport	SPS-D-2	29.82	+/-	10.92
Williamsburg – Busch Gardens	SPS-D-3	29.82	+/-	10.92
Newport News - Lee Hall	SPS-D-4	37.31	+/-	12.22
Naval Weapons Station – 1	SPS-D-5	27.13	+/-	10.42
Newport News – Fort Eustis	SPS-D-6	27.90	+/-	10.56
Surry – Route 628	SPS-D-7	10.13	+/-	6.36
Surry – Lawnes Creek	SPS-D-8	28.25	+/-	10.63
Surry Power Station	SPS-D-9	27.34	+/-	10.46
Surry – Hog Point	SPS-D-10	23.78	+/-	9.75
Surry – Bacon's Castle	SPS-D-11	26.29	+/-	10.26
Surry – Alliance	SPS-D-12	22.57	+/-	9.50
Surry – Scotland Wharf	SPS-D-13	27.54	+/-	10.50
Surry – Lebanon Baptist Church	SPS-D-14	20.60	+/-	9.08
Louisa County - Mineral	NAPS-D-1	36.20	+/-	12.03
Louisa County – Wares Crossroads	NAPS-D-2	25.53	+/-	10.11
Louisa County – Good Hope Church	NAPS-D-3	29.55	+/-	10.87
Spotsylvania – Route 713	NAPS-D-4	24.88	+/-	9.98
Spotsylvania Route 614	NAPS-D-5	25.72	+/-	10.14
Spotsylvania – Levy	NAPS-D-6	31.99	+/-	11.31
Louisa County – Bumpass Fire Dept.	NAPS-D-7	31.76	+/-	11.27
Louisa County – Fred Hall	NAPS-D-8	24.88	+/-	9.98
Louisa County – Aspen Hill	NAPS-D-9	34.81	+/-	11.80
Louisa County – Route 685	NAPS-D-10	32.61	+/-	11.42
Louisa County – Route 700	NAPS-D-11	31.30	+/-	11.19
North Anna Power Station	NAPS-D-12	34.61	+/-	11.77
Pocahontas State Park (Control)	PSP-D-1	41.77	+/-	12.93
Radiological Health	ORH-D-1	15.48	+/-	7.87
Radiological Health	ORH-D-2	15.86	+/-	7.96



# Virginia Department of Health

## AMBIENT GAMMA EXPOSURE

May 7, 2018 through August 6, 2018

### THIRD QUARTER

Location	Station	Net Exposure Rate mR/Std Qtr +/- 2S.D.		
Jamestown – Historical site	SPS-D-1	29.17	+/-	10.80
Williamsburg – Airport	SPS-D-2	23.73	+/-	9.74
Williamsburg – Busch Gardens	SPS-D-3	32.01	+/-	11.32
Newport News - Lee Hall	SPS-D-4	33.47	+/-	11.57
Naval Weapons Station – 1	SPS-D-5	22.19	+/-	9.42
Newport News – Fort Eustis	SPS-D-6	27.45	+/-	10.48
Surry – Route 628 <sup>68</sup>	SPS-D-7		+/-	
Surry – Lawnes Creek	SPS-D-8	28.59	+/-	10.69
Surry Power Station	SPS-D-9	26.89	+/-	10.37
Surry – Hog Point	SPS-D-10	25.68	+/-	10.13
Surry – Bacon's Castle	SPS-D-11	21.88	+/-	9.35
Surry – Alliance	SPS-D-12	26.91	+/-	10.37
Surry – Scotland Wharf	SPS-D-13	23.59	+/-	9.71
Surry – Lebanon Baptist Church	SPS-D-14	23.22	+/-	9.64
Louisa County - Mineral	NAPS-D-1	28.27	+/-	10.63
Louisa County – Wares Crossroads	NAPS-D-2	27.20	+/-	10.43
Louisa County – Good Hope Church	NAPS-D-3	32.73	+/-	11.44
Spotsylvania – Route 713	NAPS-D-4	26.31	+/-	10.26
Spotsylvania Route 614	NAPS-D-5	27.34	+/-	10.46
Spotsylvania – Levy	NAPS-D-6	28.27	+/-	10.63
Louisa County – Bumpass Fire Dept.	NAPS-D-7	29.77	+/-	10.91
Louisa County – Fred Hall	NAPS-D-8	23.08	+/-	9.61
Louisa County – Aspen Hill	NAPS-D-9	35.84	+/-	11.97
Louisa County – Route 685	NAPS-D-10	27.16	+/-	10.42
Louisa County – Route 700	NAPS-D-11	33.27	+/-	11.54
North Anna Power Station	NAPS-D-12	32.42	+/-	11.39
Pocahontas State Park (Control)	PSP-D-1	42.86	+/-	13.09
Radiological Health	ORH-D-1	12.62	+/-	7.11
Radiological Health	ORH-D-2	13.80	+/-	7.43

<sup>68</sup> SPS-D-7 Due to a torn beta window, TLD was not analyzed.

# Virginia Department of Health

## AMBIENT GAMMA EXPOSURE

August 6, 2018 through December 17, 2018

### FOURTH QUARTER

Location	Station	Net Exposure Rate mR/Std Qtr +/- 2S.D.		
Jamestown – Historical site	SPS-D-1	30.51	+/-	11.05
Williamsburg – Airport	SPS-D-2	37.85	+/-	12.30
Williamsburg – Busch Gardens	SPS-D-3	41.74	+/-	12.92
Newport News - Lee Hall	SPS-D-4	47.40	+/-	13.77
Naval Weapons Station – 1	SPS-D-5	34.59	+/-	11.76
Newport News – Fort Eustis	SPS-D-6	37.47	+/-	12.24
Surry – Route 628	SPS-D-7	45.16	+/-	13.44
Surry – Lawnes Creek	SPS-D-8	35.08	+/-	11.85
Surry Power Station	SPS-D-9	34.14	+/-	11.69
Surry – Hog Point	SPS-D-10	34.18	+/-	11.69
Surry – Bacon's Castle	SPS-D-11	33.18	+/-	11.52
Surry – Alliance	SPS-D-12	30.33	+/-	11.01
Surry – Scotland Wharf	SPS-D-13	36.01	+/-	12.00
Surry – Lebanon Baptist Church	SPS-D-14	24.26	+/-	9.85
Louisa County - Mineral	NAPS-D-1	46.60	+/-	13.65
Louisa County – Wares Crossroads	NAPS-D-2	33.56	+/-	11.59
Louisa County – Good Hope Church	NAPS-D-3	42.03	+/-	12.97
Spotsylvania – Route 713	NAPS-D-4	34.69	+/-	11.78
Spotsylvania Route 614	NAPS-D-5	35.84	+/-	11.97
Spotsylvania – Levy	NAPS-D-6	40.91	+/-	12.79
Louisa County – Bumpass Fire Dept.	NAPS-D-7	41.38	+/-	12.86
Louisa County – Fred Hall	NAPS-D-8	33.49	+/-	11.57
Louisa County – Aspen Hill	NAPS-D-9	45.81	+/-	13.54
Louisa County – Route 685	NAPS-D-10	42.57	+/-	13.05
Louisa County – Route 700	NAPS-D-11	42.90	+/-	13.10
North Anna Power Station	NAPS-D-12	42.14	+/-	12.98
Pocahontas State Park (Control)	PSP-D-1	49.15	+/-	14.02
Radiological Health	ORH-D-1	16.24	+/-	8.06
Radiological Health	ORH-D-2	18.77	+/-	8.67

# COMMONWEALTH OF VIRGINIA

## DEPARTMENT OF HEALTH

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### OFFICE OF RADIOLOGICAL HEALTH

109 Governor Street, 7<sup>th</sup> Floor, Richmond, Virginia 23218-2448

Office (804) 864-8150

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# BABCOCK & WILCOX

# Virginia Department of Health

## AIR PARTICULATE COMPOSITE SAMPLES

January 1, 2018 through December 31, 2018

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>				
<b>1st</b>	01/03/2018	-	01/09/2018	0.001

### SECOND QUARTER REPORT

	Start	Date	Stop	Gross Alpha Activity pCi/meter <sup>3</sup>
<b>B&amp;W-A-1</b>				
<b>2nd</b>	04/04/2018	-	04/10/2018	0.001

### THIRD QUARTER REPORT

	Start	Date	Stop	Gross Alpha Activity pCi/meter <sup>3</sup>
<b>B&amp;W-A-1</b>				
<b>3rd</b>	07/11/2018	-	07/18/2018	0.002

### FOURTH QUARTER REPORT

	Start	Date	Stop	Gross Alpha Activity pCi/meter <sup>3</sup>
<b>B&amp;W-A-1</b>				
<b>4th</b>	10/11/18	-	10/17/18	0.001

## Virginia Department of Health SOIL

January 1, 2018 through December 31, 2018

Location	Date	Distance & Direction	Type	Alpha Activity ppm
Eastern Site Boundary Ball field B&W-S-1	12/04/18	Site Boundary	Soil	<1.0
James River Shoreline Near Six Mile Bridge "control" B&W-S-2	12/04/18	1.5 miles SW	Soil	<1.0

Soil samples collected annually.

Note: Uranium separation followed by alpha counting.

## SURFACE WATER

January 1, 2018 through December 31, 2018

Location	Date	Distance & Direction	Alpha Activity ppb
James River Shoreline Near Ball field at eastern site boundary B&W-W-1	12/04/18	Approx. 3 miles downstream	<2
James River Shoreline  Near Six Mile Bridge "control" B&W-W-2	12/04/18	Approx. 1.5 miles  upstream	<2

Surface water samples collected annually.

Note: Uranium separation followed by alpha counting.

# Virginia Department of Health

## VEGETATION

January 1, 2018 through June 30, 2018

Eastern Site Boundary / James River Shoreline

Location	Date	Distance & Direction	Alpha Activity ppm
Eastern site boundary Ball field B&W-V-1	12/04/18	Approx. 3 miles downstream	<1.0
James River Shoreline off Rt. 460 "control" B&W-V-2	12/04/18	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 (COVERERP), 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.