

Appendix D: Radiological Environmental Monitoring Program Supplemental Information

Negative values are reported in tables in this appendix. Background counts are subtracted from the sample counts. Negative values occur when the background count is greater than the sample count. Background counts reflect naturally occurring radionuclides and cosmic radiation that is detected by laboratory instrumentation.

Appendix Table D-1 Summary of Radioactive Atmospheric Releases by Source

All values under the "Calculated" column through "Totals" column are reported in curies.^a

In the Calculated column, blanks indicate the radionuclide is not present. In the facility (Reactors, Separations, SRNL) columns, a blank indicates the radionuclide was not analyzed. A 0.00E+00 in the facility columns indicates the result was not significant.

Radionuclide	Half-Life Time Interval ^b		Calculated ^c	Reactors	Separations ^d	SRNL	Total
<i>Gases and Vapors</i>							
H-3 (oxide)	12.3	y	2.46E+02	9.85E+02	6.71E+03		7.94E+03
H-3 (elemental)	12.3	y			1.31E+03		1.31E+03
H-3 Total	12.3	y	2.46E+02	9.85E+02	8.02E+03		9.25E+03
C-14	5700	y	9.48E-08		5.00E-02		5.00E-02
Hg-203	46.6	d	6.51E-10				6.51E-10
Kr-85	10.8	y			1.07E+04		1.07E+04
I-129	1.57E+07	y	4.31E-05		9.95E-03	8.67E-07	9.99E-03
I-131	8.02	d	7.01E-10				7.01E-10
<i>Particles</i>							
Ag-110m	250	d	1.48E-11				1.48E-11
Am-241	432	y	1.13E-05	0.00E+00	6.07E-06		1.73E-05
Am-243	7370	y	3.97E-09				3.97E-09
Ba-133	10.5	y	7.74E-07				7.74E-07
Cd-109	461	d	1.68E-08				1.68E-08
Ce-139	138	d	6.71E-10				6.71E-10
Ce-141	32.5	d	4.94E-11				4.94E-11
Ce-144	285	d	2.00E-08				2.00E-08
Cf-249	351	y	7.89E-12				7.89E-12
Cf-251	900	y	1.78E-11				1.78E-11
Cm-243	29.1	y	2.90E-09				2.90E-09
Cm-244	18.1	y	2.75E-07	0.00E+00	2.39E-08		2.99E-07
Co-57	272	d	6.41E-10				6.41E-10
Co-58	70.9	d			1.04E-06		1.04E-06
Co-60	5.27	y	6.30E-07	0.00E+00	0.00E+00	0.00E+00	6.30E-07
Cs-134	2.06	y	4.32E-07				4.32E-07
Cs-137	30.2	y	3.84E-03	0.00E+00	3.42E-05	0.00E+00	3.88E-03
Eu-152	13.5	y	1.90E-09				1.90E-09
Eu-154	8.59	y	3.56E-07				3.56E-07
Eu-155	4.76	y	1.18E-07				1.18E-07
F-18	110	m	4.00E-02				4.00E-02
Fe-55	2.74	y	8.04E-09				8.04E-09
Mn-54	312	d	6.01E-10				6.01E-10

Appendix Table D-1 Summary of Radioactive Atmospheric Releases by Source (continued)

Radionuclide	Half-Life Time Interval ^b	Calculated ^c	Reactors	Separations ^d	SRNL	Total
Particles						
Nb-94	2.03E+04 y	2.42E-07				2.42E-07
Nb-95	35.0 d	3.63E-07				3.63E-07
Ni-59	1.01E+05 y	5.76E-11				5.76E-11
Ni-63	100 y	7.41E-09				7.41E-09
Np-237	2.14E+06 y	1.55E-06	0.00E+00	6.80E-08		1.61E-06
Pa-233	27.0 d	1.42E-06				1.42E-06
Pb-212	10.6 h	8.43E-07				8.43E-07
Pm-147	2.62 y	2.89E-06				2.89E-06
Pm-148m	41.3 d	1.90E-12				1.90E-12
Pr-144	17.3 m	2.00E-08				2.00E-08
Pu-236	2.86 y	5.52E-10				5.52E-10
Pu-238	87.7 y	3.13E-05	4.42E-10	4.39E-06		3.57E-05
Pu-239	2.41E+04 y	6.84E-05	0.00E+00	7.01E-05		1.38E-04
Pu-240	6560 y	7.68E-06				7.68E-06
Pu-241	14.4 y	2.07E-04				2.07E-04
Pu-242	3.75E+05 y	3.28E-06				3.28E-06
Ra-226	1600 y	5.97E-07				5.97E-07
Ra-228	5.75 y	5.93E-07				5.93E-07
Rh-106 ^e	29.8 s	3.05E-06				3.05E-06
Ru-103	39.3 d	5.11E-10				5.11E-10
Ru-106	374 d	3.05E-06				3.05E-06
Sb-125	2.76 y	1.18E-06				1.18E-06
Sb-126 ^e	12.4 d	1.70E-07				1.70E-07
Se-79	2.95E+05 y	4.90E-09				4.90E-09
Sm-151	90 y	2.89E-06				2.89E-06
Sn-113	115 d	8.31E-10				8.31E-10
Sn-123	129 d	6.66E-12				6.66E-12
Sn-126	2.30E+05 y	1.70E-07				1.70E-07
Sr-85	64.8 d	7.61E-10				7.61E-10
Sr-89	50.5 d	5.99E-10				5.99E-10
Sr-90	28.8 y	3.32E-03	0.00E+00	3.21E-05		3.35E-03
Tc-99	2.11E+05 y	5.08E-05				5.08E-05
Te-127	9.35 h	1.04E-11				1.04E-11
Te-129	69.6 m	1.05E-12				1.05E-12
Th-228	1.91 y	1.34E-08	2.69E-09			1.61E-08
Th-229	7340 y	1.34E-09				1.34E-09
Th-230	7.54E+04 y	9.73E-11	6.51E-09			6.61E-09
Th-231	25.5 h	2.12E-04				2.12E-04
Th-232	1.41E+10 y	9.86E-12	3.13E-09			3.14E-09

Appendix Table D-1 Summary of Radioactive Atmospheric Releases by Source (continued)

Radionuclide	Half-Life Time Interval ^b		Calculated ^c	Reactors	Separations ^d	SRNL	Total
Particles							
Tl-208	3.05	m	1.41E-06				1.41E-06
U-232	68.9	y	5.50E-09				5.50E-09
U-233	1.59E+05	y	3.42E-09				3.42E-09
U-234	2.46E+05	y	4.12E-07	2.92E-09	2.68E-05		2.72E-05
U-235	7.04E+08	y	1.25E-08	0.00E+00	1.36E-06		1.37E-06
U-236	2.34E+07	y	3.01E-08				3.01E-08
U-238	4.47E+09	y	2.72E-07	2.84E-09	3.52E-05		3.55E-05
Y-88	107	d	5.81E-10				5.81E-10
Y-90^e	64.1	h	3.32E-03	0.00E+00	3.21E-05		3.35E-03
Y-91	58.5	d	2.14E-09				2.14E-09
Zn-65	244	d	5.82E-10				5.82E-10
Zr-95	64.0	d	1.22E-07				1.22E-07
Unidentified alpha	N/A		4.14E-05	1.58E-07	3.88E-07	0.00E+00	4.19E-05
Unidentified beta	N/A		1.03E-03	5.59E-05	9.92E-05	1.24E-06	1.19E-03
Total	N/A		2.46E+02	9.85E+02	1.87E+04	2.11E-06	2.00E+04

^a One curie equals 3.7E+10 becquerels

^b ICRP 107, *Nuclear Decay Data for Dosimetric Calculations* (2008). Half-life time intervals are given in seconds (s), days (d), months (m), and years (y).

^c Estimated releases from unmonitored sources. Beginning in 2016, individual isotope annual releases below 1E-12 Ci (1 pCi) are no longer reported in this table and, therefore, not used in the dose calculations.

^d Includes separations, waste management, and tritium facilities

^e Daughter products (Sb-126, Rh-106, & Y-90) in secular equilibrium with source terms (Sn-126, Ru-106, & Sr-90, respectively). In MAXDOSE/POPDOSE, they are included in the source term and their ingrowth is included in their parents' source term.

Appendix Table D-2 Summary of Air Effluent DOE DCS Sum of Fractions

As discussed in Chapter 5, SRS evaluates the effluent monitoring program by comparing the annual average concentrations to the DOE derived concentration standards (DCSs). DOE's *Derived Concentration Technical Standard*, DOE-STD-1196-2011 (DOE 2011) establishes numerical standards for DCSs to support implementing DOE Order 458.1. This table presents the air effluent DCS sum of fractions for continuously monitored sources. Discussion regarding the 291-F sum of fractions exceedance can be found in Section 5.3.2.1.

Facility (Sampling Location)	Radionuclides Included in the DCS Sum of Fractions	DCS Sum of Fractions	DCS Sum of Fractions Excluding Tritium
A Area (791-A Sandfilter Discharge)	I-129	1.28E-04	1.28E-04
C Area (C-Area Main Stack)	H-3 (oxide)	1.78E+00	0.00E+00
F Area (235-F Sandfilter Discharge)	Sr-89/90, U-234, U-238, Pu-238, Pu-239	4.02E-03	4.02E-03
F Area (291-F Stack Isokinetic)	Sr-89/90, I-129, Cs-137, U-234, U-235, Np-237, U-238, Pu-238, Pu-239, Am-241, Cm-244	2.08E+00	2.08E+00
F Area (772-4F Stack)	U-234, U-238, Pu-238, Pu-239, Am-241	2.01E-03	2.01E-03
H Area (291-H Stack Isokinetic)	H-3 (oxide), C-14, Kr-85, Co-58, Sr-89/90, I-129, Cs-137, U-234, U-238, Pu-238, Pu-239, Am-241	9.68E-02	9.68E-02
K Area (K-Area Main Stack)	H-3 (oxide)	1.78E+00	0.00E+00
L Area (L-Area Disassembly)	H-3 (oxide)	1.76E+00	0.00E+00
L Area (L-Area Main Stack)	H-3 (oxide)	1.97E+00	0.00E+00
Tritium (232-H)	H-3 (elemental), H-3 (oxide)	1.82E+01	0.00E+00
Tritium (233-H)	H-3 (elemental), H-3 (oxide)	2.69E+00	0.00E+00
Tritium (234-H)	H-3 (elemental), H-3 (oxide)	5.75E+00	0.00E+00
Tritium (238-H)	H-3 (oxide)	3.27E+00	0.00E+00
Tritium (264-H)	H-3 (elemental), H-3 (oxide)	5.01E+00	0.00E+00

Appendix Table D-3 Summary of Tritium in Environmental Air

Samples were collected approximately every 2 weeks at each of the 14 locations. Two samples were not collected due to field retrieval errors: Burial Ground North Nov. 20 to Dec. 4 and D Area June 5–19. Bolded minimum and maximum concentration results were reported as detected. Minimum and maximum concentrations not bolded indicate the result was less than the analytical method detection limit or the uncertainty is large. The results at the following locations were all not detected: Site Perimeter (Allendale Gate, East Talatha, and Patterson Mill Road) and 25-Mile Radius (Highway 301 @ State Line). The Highway 301 @ State Line location is the control location.

Location	Number of Detected Results	Mean Concentration (pCi/m ³)	Minimum Concentration (pCi/m ³)	Maximum Concentration (pCi/m ³)
Onsite				
Burial Ground North	25 of 25	2.37E+02	3.65E+01	7.49E+02
Site Perimeter				
Barnwell Gate	4 of 26	2.58E+00	-9.16E+00	1.34E+01
D Area	5 of 25	4.83E+00	-7.27E+00	1.48E+01
Darkhorse @ Williston Gate	2 of 26	3.65E+00	-8.68E+00	1.18E+01
Green Pond	2 of 26	4.33E+00	-3.57E+00	1.81E+01
Highway 21/167	1 of 26	2.81E+00	-6.16E+00	1.02E+01
Jackson	2 of 26	4.09E+00	-5.30E+00	1.25E+01
Talatha Gate	4 of 26	5.25E+00	-6.68E+00	3.14E+01
25-Mile Radius				
Aiken Airport	1 of 26	2.97E+00	-7.24E+00	1.42E+01
Augusta Lock & Dam 614	1 of 26	2.52E+00	-9.68E+00	1.10E+01

Appendix Table D-4 Summary of Tritium in Rainwater

Samples were collected approximately every 4 weeks at each of the 14 locations for a total of 13 samples at each site. However, in October 2019, Allendale Gate, Barnwell Gate, and D Area had minimal rainfall, and no sample could be collected for a total of 12 samples for the year. Bolded minimum and maximum concentration results were reported as detected. Minimum and maximum concentrations not bolded indicate the result was less than the analytical method detection limit or the uncertainty is large. The results at the following locations were all not detected: Site Perimeter (Allendale Gate, Barnwell Gate, Darkhorse @ Williston Gate, East Talatha, Green Pond, Highway 21/167, Jackson, and Patterson Mill Road) and 25-Mile Radius (Augusta Lock and Dam 614, Aiken Airport, and Highway 301 @ State Line). The Highway 301 @ State Line location is the control location.

Location	Number of Detected Results	Mean Concentration (pCi/L)	Minimum Concentration (pCi/L)	Maximum Concentration (pCi/L)
<i>Onsite</i>				
Burial Ground North	13 of 13	1.88E+03	4.30E+02	3.81E+03
<i>Site Perimeter</i>				
D Area	1 of 12	8.17E+01	-1.24E+02	5.32E+02
Talatha Gate	2 of 13	5.95E+01	-1.74E+02	3.89E+02

Appendix Table D-5 Summary of Radionuclides in Environmental Air

Glass fiber filter samples were collected approximately every 2 weeks at each of the 14 locations. Samples from all locations were analyzed biweekly for gamma emitting radionuclides, gross alpha, and gross beta. The onsite Burial Ground North is the only location where samples were analyzed for actinides and strontium-89/90 biweekly. Due to lab prep and analysis errors, americium-241 was not reported in 4 of 26 samples, and plutonium results were not reported in 3 of 26 samples at Burial Ground North. One sample from every perimeter location and 25-mile radius location was chosen for actinide and strontium-89/90 analysis, based on elevated releases at F-Canyon stack during 2019.

Bolded concentration results were reported as detected. Concentrations not bolded indicate the result was less than the analytical method detection limit or that the uncertainty is large.

Cobalt-60 and cesium-137 results were not detected for any samples collected biweekly.

Biweekly Samples: All Locations

Radionuclide	Number of Detected Results	Location of Minimum Concentration	Minimum Concentration (pCi/m ³)	Location of Maximum Concentration	Maximum Concentration (pCi/m ³)
Gross Alpha	363 of 364	Aiken Airport	1.04E-04	Augusta Lock & Dam	3.38E-03
Gross Beta	364 of 364	Patterson Mill Road	5.76E-03	Augusta Lock & Dam	2.84E-02

Cm-244 and Sr-89/90 results were not detected for site Burial Ground North; thus, they were not reported in the table Biweekly Actinide and Sr-89/90 Samples.

Biweekly Actinide and Sr-89/90 Samples

Location: Burial Ground North				
Radionuclide	Number of Detected Results	Mean Concentration (pCi/m ³)	Minimum Concentration (pCi/m ³)	Maximum Concentration (pCi/m ³)
U-234	25 of 26	2.36E-05	3.68E-06	5.46E-05
U-235	1 of 26	1.69E-06	-1.11E-06	5.49E-06
U-238	25 of 26	1.91E-05	3.38E-06	3.32E-05
Pu-238	3 of 23	2.13E-06	-1.15E-06	1.27E-05
Pu-239	1 of 23	1.24E-06	-1.03E-06	6.00E-06
Am-241	8 of 22	4.46E-06	1.83E-06	1.27E-05

U-235, Pu-239, Sr-89/90, and Cm-244 results were not detected for the annual sites; thus, they were not reported in the table Annual Actinide and Sr-89/90 Samples.

Annual Actinide and Sr-89/90 Samples

Location	Number of Samples	U-234	U-238	Pu-238	Am-241
		Concentration (pCi/m ³)	Concentration (pCi/m ³)	Concentration (pCi/m ³)	Concentration (pCi/m ³)
Allendale Gate	1	1.22E-05	1.05E-05	8.22E-06	1.26E-05
Barnwell Gate	1	3.65E-05	2.84E-05	0.00E+00	8.46E-06
D Area	1	1.10E-05	7.27E-05	0.00E+00	2.64E-06
Darkhorse @ Williston Gate	1	3.97E-05	2.12E-05	2.70E-06	4.70E-06
East Talatha	1	2.84E-05	3.19E-05	-7.46E-07	-1.75E-07
Green Pond	1	3.46E-05	1.94E-05	0.00E+00	-1.51E-07
Highway 21/167	1	2.76E-05	2.52E-05	6.76E-07	4.78E-06
Jackson	1	2.95E-05	2.57E-05	-6.97E-07	3.41E-06
Patterson Mill Road	1	2.84E-05	2.05E-05	4.57E-06	4.89E-06
Talatha Gate	1	3.14E-05	1.70E-05	0.00E+00	5.62E-06
Aiken Airport	1	2.60E-05	2.03E-05	1.21E-06	1.63E-07
Augusta Lock and Dam 614	1	3.00E-05	2.39E-05	1.35E-06	3.54E-06
Highway 301 @ State Line (Control Location)	1	3.54E-05	2.10E-05	1.89E-06	5.78E-06

Appendix Table D-6 Summary of Gamma Surveillance

Samples were collected approximately every quarter (12 weeks) at each of 50 locations. Typically, two samples are collected from each location. This was the case in 2019, except for Population Center location McBean, where one sample was missing during the retrieval of third-quarter samples.

Station Location Type	Percent of Stations	Quarter 1 Average mR/day	Quarter 2 Average mR/day	Quarter 3 Average mR/day	Quarter 4 Average mR/day	Annual Total Average mR/year	Annual Minimum mR/year	Annual Maximum mR/year
Population Centers	9	0.33	0.38	0.40	0.41	135.2	92.3	157.0
Site Perimeter	9	0.27	0.31	0.34	0.35	115.2	101.1	129.3
Air Surveillance Stations	14	0.29	0.32	0.35	0.36	120.7	100.7	150.7
Plant Vogtle Vicinity	18	0.26	0.31	0.33	0.32	109.6	71.8	138.03

Appendix D-7 Summary of Radionuclides in Soil

Samples are typically collected annually from 22 locations; however, the sampling location at Creek Plantation Trail 6 (2,300 ft) was inaccessible due to vegetation overgrowth, and only 21 samples were collected in 2019. Bolded values are detected results. Values not bolded indicate the result was less than the analytical method detection limit or the uncertainty is large.

The following locations were sampled: Creek Plantation Trail 1 (1,175 ft), Creek Plantation Trail 1 (1,600 ft), Creek Plantation Trail 1 (1,805 ft), F Area (2,000 feet West), H Area (2,000 ft East), Z Area (#3), Burial Ground Locations (643-26E-2 and Burial Ground North), Plant Perimeter Locations (Allendale Gate, Barnwell Gate, D Area, Darkhorse @ Williston Gate, East Talatha, Green Pond, Highway 21/167, Jackson, Patterson Mill Road, and Talatha Gate) and 25-Mile Radius Locations (Aiken Airport, Augusta Lock and Dam 614, and Highway 301 @ State Line). The Highway 301 @ State Line is the control location. Creek Plantation samples are analyzed for gamma and Sr-89/90.

All Co-60 and Np-237 results were not detected; thus, they were not reported in this table.

Radionuclide	Percent of Detected Results	Control Hwy 301 Concentration (pCi/g)	Location of Minimum Concentration	Minimum Concentration (pCi/g)	Location of Maximum Concentration	Maximum Concentration (pCi/g)
Cs-137	19 of 21	1.35E-01	Burial Ground (643-26E-2)	1.69E-02	Creek Plantation Trail 1 (1805 ft)	2.76E+01
U-234	18 of 18	1.34E+00	Allendale Gate	3.81E-01	Augusta Lock and Dam 614	1.39E+00
U-235	17 of 18	7.24E-02	Darkhorse @ Williston Gate	1.14E-02	Burial Ground (643-26E-2)	9.00E-02
Sr-89/90	1 of 21	1.13E-01	Darkhorse @ Williston Gate	-3.49E-02	Creek Plantation Trail 1 (1805 ft)	1.42E-01
U-238	18 of 18	1.34E+00	Allendale Gate	3.70E-01	Augusta Lock and Dam 614	1.40E+00
Pu-238	5 of 18	7.08E-04	Allendale Gate	-1.97E-04	F Area (2000 feet west)	5.08E-02
Pu-239	18 of 18	7.08E-03	Burial Ground (643-26E-2)	2.42E-03	F Area (2000 feet west)	9.43E-02
Am-241	13 of 18	2.49E-03	Burial Ground North	4.51E-04	Augusta Lock and Dam 614	1.51E-02
Cm-244	1 of 18	6.73E-04	Allendale Gate	-3.08E-04	Augusta Lock and Dam 614	2.13E-03
Gross Beta	18 of 18	1.19E+01	Aiken Airport	3.97E+00	Augusta Lock and Dam 614	1.66E+01
Gross Alpha	18 of 18	1.53E+01	Aiken Airport	3.22E+00	Augusta Lock and Dam 614	2.70E+01

Appendix Table D-8 Summary of Radionuclides in Grassy Vegetation

Samples are collected annually from 14 locations. Bolded values are detected results. Values not bolded indicate the result was less than the analytical method detection limit or the uncertainty is large. All results for Co-60, U-235, Np-237, Pu-238, Pu-239, Am-241, Cm-244, and gross alpha were not detected; thus, they were not reported in this table.

The following locations are sampled: Control (Highway 301 at the SC/GA State line), Onsite location (Burial Ground North), Site Perimeter locations (Allendale Gate, Barnwell Gate, D Area, Darkhorse @ Williston Gate, East Talatha, Green Pond, Highway 21/167, Jackson, Patterson Mill Road, Talatha Gate), and 25-Mile Radius Locations (Aiken Airport and the Augusta Lock and Dam 614).

Radionuclide	Percent of Detected Results	Control (Highway 301) Concentration (pCi/g)	Location of Minimum Concentration	Minimum Concentration (pCi/g)	Location of Maximum Concentration	Maximum Concentration (pCi/g)
H-3	2 of 14	2.76E-02	Darkhorse @ Williston Gate	-2.66E-02	Burial Ground North	1.11E+00
Cs-137	7 of 14	3.38E-02	Augusta Lock & Dam 614	-6.41E-02	Allendale Gate	8.08E-01
Sr-89/90	10 of 14	1.38E-01	Talatha Gate	1.25E-02	Highway 21/167	4.54E-01
U-234	14 of 14	7.32E-03	Augusta Lock and Dam 614	5.05E-03	Highway 21/167	1.54E-02
U-238	14 of 14	3.97E-03	East Talatha	4.97E-03	Highway 21/167	1.37E-02
Tc-99	14 of 14	4.32E-01	Jackson	2.20E-01	Highway 21/167	7.89E-01
Gross Beta	14 of 14	1.56E+01	Darkhorse @ Williston Gate	5.73E+00	Augusta Lock & Dam 614	1.96E+01

Appendix Table D-9 Summary of Radionuclides in Foodstuffs

Samples of five foodstuffs are collected annually from five regions surrounding SRS. Beef, greens, and fruit are collected each year. Six foodstuffs are collected on a rotating three-year cycle. Cabbage and grains were the rotational crop samples collected in 2019. The collected grains were rye and wheat, based on availability. Bolded minimum and maximum concentration results were reported as detected. Minimum and maximum concentrations not bolded indicate the result was less than the analytical method detection limit, or the uncertainty is large.

Food Type	Nuclide	Number of Samples	Number of Results > Detection Limit	Mean Sample Concentration (pCi/g)	Minimum Sample Concentration (pCi/g)	Maximum Sample Concentration (pCi/g)
Beef	H-3	5	1	2.65E-02	-9.81E-03	7.22E-02
	Tc-99	5	1	3.95E-02	7.32E-03	9.78E-02
	U-234	5	1	1.87E-04	1.24E-05	8.24E-04
	U-235	5	1	3.53E-05	9.62E-06	9.16E-05
	U-238	5	4	1.87E-04	7.78E-06	6.70E-04
	Gross Beta	5	5	1.58E+00	1.25E+00	1.86E+00
Cs-137, Co-60, Np-237, Pu-238, Pu-239, Am-241, Cm-244, Sr-89,90, and gross alpha were not detected in beef.						
Greens	H-3	5	1	3.82E-02	2.86E-03	9.54E-02
	Cs-137	5	5	2.99E-02	1.18E-02	8.30E-02
	Sr-89,90	5	5	1.17E-01	4.08E-02	2.08E-01
	Tc-99	5	4	4.62E-01	1.24E-01	1.05E+00
	U-234	5	5	1.13E-02	2.81E-03	3.95E-02
	U-235	5	1	5.78E-04	5.62E-05	1.98E-03
	U-238	5	5	1.12E-02	2.20E-03	4.27E-02
	Pu-238	5	1	2.94E-04	9.05E-05	6.68E-04
	Gross Beta	5	5	2.25E+01	1.65E+01	2.78E+01
Co-60, Np-237, Pu-239, Am-241, Cm-244, and gross alpha were not detected in greens.						
Fruit (watermelon)	Sr-89,90	5	1	3.75E-03	4.84E-04	8.57E-03
	Gross Beta	5	5	1.18E-01	7.78E-02	2.00E-01
H-3, Cs-137, Co-60, Np-237, Pu-238, Pu-239, Am-241, Cm-244, U-234, U-235, U-238, Tc-99, and gross alpha were not detected in fruit.						
Cabbage	Cs-137	5	1	1.24E-02	-2.59E-03	3.14E-02
	Sr-89,90	5	2	4.23E-02	1.39E-02	1.07E-01
	Tc-99	5	5	8.17E-01	3.59E-01	1.60E+00
	U-234	5	5	5.86E-02	1.69E-03	2.24E-01
	U-235	5	4	3.20E-03	2.67E-04	9.70E-03
	U-238	5	5	5.89E-02	2.97E-03	2.25E-01
	Pu-238	5	2	2.88E-04	-7.38E-05	6.70E-04
	Np-237	5	1	3.09E-04	-4.76E-06	6.92E-04
	Am-241	5	1	2.50E-04	0.00E+00	4.84E-04
	Gross Beta	5	5	1.83E+01	1.57E+01	2.43E+01
H-3, Co-60, Pu-239, Cm-244, and gross alpha were not detected in cabbage.						

Food Type	Nuclide	Number of Samples	Number of Results > Detection Limit	Mean Sample Concentration (pCi/g)	Minimum Sample Concentration (pCi/g)	Maximum Sample Concentration (pCi/g)
Grains	Cs-137	5	1	6.80E-03	-6.38E-04	2.64E-02
	Sr-89,90	5	1	2.29E-02	-3.03E-03	7.30E-02
	U-234	5	5	2.43E-03	1.92E-03	2.86E-03
	U-238	5	5	2.28E-03	1.80E-03	3.43E-03
	Pu-238	5	2	3.64E-04	-5.16E-05	8.92E-04
	Cm-244	5	1	2.49E-04	1.09E-04	6.73E-04
	Gross Beta	5	5	5.05E+00	3.86E+00	6.65E+00
H-3, Co-60, U-235, Am-241, Np-237, Pu-239, and Tc-99, and gross alpha were not detected in grains.						

Appendix Table D-10 Summary of Radionuclides in Dairy

SRS collects cow and goat milk samples from dairies in communities surrounding the Site. The number listed in parentheses in the "location" column indicates the number of dairies in the named state that provide samples to SRS.

Bolded minimum and maximum concentration results were reported as detected. Minimum and maximum concentrations not bolded indicate the result was less than the analytical method detection limit or the uncertainty is large. All Co-60 results were not detected and, thus, not reported in this table.

Location	Nuclide	Number of Samples	Number of Results > Detection Limit	Mean Sample Concentration (pCi/L)	Minimum Sample Concentration (pCi/L)	Maximum Sample Concentration (pCi/L)
SC-Dairies (4) cow milk	H-3	14	0			
SC-Dairies (1) goat milk	H-3	2	0			
GA-Dairies (3) cow milk	H-3	12	1	5.55E+01	-6.32E+01	2.04E+02
SC-Dairies (4) cow milk	Cs-137	14	0			
SC-Dairies (1) goat milk	Cs-137	2	2	7.13E+00	6.68E+00	7.57E+00
GA-Dairies (3) cow milk	Cs-137	12	0			
SC-Dairies (4) cow milk	Sr-90	14	2	5.44E-01	-3.54E-01	3.16E+00
SC-Dairies (1) goat milk	Sr-90	2	2	1.77E+00	9.51E-01	2.58E+00
GA-Dairies (3) cow milk	Sr-90	12	1	2.95E-01	-1.94E-01	1.29E+00

Appendix Table D-11 Radiation in Liquid Source Releases

All values under the “Reactors,” “Separations,” “SRNL,” and the “Totals” column are reported in curies. ^a

Tritium is the main contributing radionuclide in liquid source releases. Although the remaining radionuclides are contributors, their contributions in liquid source releases are minimal.

In the facility (Reactor, Separations, SRNL) columns, a blank indicates the radionuclide was not analyzed. A 0.00E+00 in the facility columns indicates the result was not significant.

All Co-60 results were not detected; thus, they were not reported in this table.

Radionuclide	Half-Life Time Interval ^b		Reactors (Ci)	Separations ^c (Ci)		SRNL (Ci)	Totals (Ci)
H-3 ^d	y		1.29E+02	2.9	0.00E+00		4.24E+02
C-14	5,700	y		1.5	3.25E-04		1.53E-02
Sr-90	28.8	y	0.00E+00	1.3			1.31E-02
Tc-99	2.11E+05	y		1.6	0.00E+00		1.66E-02
I-129	1.57E+07	y		8.9	0.00E+00		8.92E-03
Cs-137 ^e	30.2	y	0.00E+00	8.2	0.00E+00		8.24E-03
Ra-226	1,600	y		2.3			2.32E-03
U-234	2.46E+05	y		1.9	6.90E-05		1.93E-02
U-235	7.04E+08	y		3.5	3.96E-06		3.62E-04
U-238	4.47E+09	y		2.2	5.28E-05		2.20E-02
Np-237	2.14E+06	y		8.6			8.61E-05
Pu-238	87.7	y		1.0	1.45E-05		1.21E-04
Pu-239	2.41E+04	y		5.4	3.92E-06		9.38E-06
Am-241	432	y		1.1			1.16E-05
Cm-244	18.1	y		2.1			2.17E-06
Alpha ^f			3.86E-03	4.8	5.66E-04		4.91E-03
Beta-Gamma ^g			3.82E-02		2.58E	11.06E-03	4.18E-02
				Sum			4.24E+02

^a One curie equals 3.7E+10 becquerels

^b ICRP 107, *Nuclear Decay Data for Dosimetric Calculations* (2008). Half-life time intervals are given in years (y).

^c Includes separations, waste management, and tritium processing facilities.

^d The tritium release total, which includes direct + migration releases, is used in the dose calculations for SRS impacts.

^e Depending on which value is higher, the Cs-137 release total is based on concentrations measured in Steel Creek mouth fish near RM 141.5 or on the actual measured effluent release total from the Site. Refer to Chapter 6, *Radiological Dose Assessment*, for more information.

^{f,g} For dose calculations, unidentified alpha and beta/gamma releases are assumed to be Pu-239 and Sr-90, respectively.

Appendix Table D-12 Summary of Liquid Effluent DOE DCS Sum of Fractions by Facility

Facility (Sampling Location)	Radionuclides Included in The Sum of Fractions	DCS Sum of Fractions	DCS Sum of Fractions Excluding Tritium
A Area (TB-2 Outfall at Road 1A)	C-14, U-234, U-235, U-238, Pu-238, Pu-239	4.23E-04	4.23E-04
F Area (F-013 200-F Cooling Basin)	H-3, Cs-137, U-234, U-235, U-238, Pu-238, Pu-239	3.27E-03	2.71E-03
F Area (F-05)	H-3, Sr-89/90, I-129, U-234, U-238, Pu-238, Pu-239, Am-241, Cm-244, Tc-99	1.61E-02	1.56E-02
F Area (FM-3 F-Area Effluent)	H-3, U-234, U-238, Pu-238, Pu-239, Am-241, Tc-99	6.31E-04	3.34E-04
F-Tank Farm (F-012 281-8F Retention Basin)	H-3, Sr-89/90, Cs-137, U-234, U-238, Pu-238	5.99E-03	5.61E-03
H Area (FM-1C H-Area Effluent)	H-3, Sr-89/90, U-234, Np-237, U-238, Pu-238, Pu-239, Am-241, Cm-244	3.23E-03	2.12E-03
H Area (H-004)	H-3, U-234, U-235, U-238, Pu-238	4.61E-03	8.91E-04
H-ETP (U3R-2A ETP Outfall at Road C)	H-3, C-14, Sr-89/90, Cs-137, U-234, U-238, Pu-239	1.01E+00	1.72E-03
H-Tank Farm (H-017 281-8H Retention Basin)	H-3, Sr-89/90, I-129, Cs-137, U-234, U-238, Pu-238, Pu-239, Am-241, Tc-99	1.45E-02	1.36E-02
H-Tank Farm (HP-52 H-Area Tank Farm)	H-3, Sr-89/90, U-234, U-238, Pu-238, Am-241	1.15E-03	4.51E-04
K Area (K Canal)	H-3	7.08E-05	0.00
S Area (S-004)	H-3, Cs-137, U-234, U-238, Pu-238	2.24E-03	1.12E-03
Tritium (HP-15 Tritium Facility Outfall)	H-3	4.74E-03	0.00

Appendix Table D-13 Summary of Radionuclides in Sediments

SRS collected annual sediment samples at 39 locations in 2019—11 Savannah River, 20 stream, and 8 stormwater basins, totaling 462 analytes. Locations sampled are as follows: Savannah River locations (mouths of Beaver Dam Creek [BDC] and Steel Creek [SC], River Miles [RM] 118.7, 129, 134.0, 150.2, 150.4, 151, 157.2, 160.5, and 161.0), SRS Stream locations (downstream of R-1, FM-2, FM-3A, FM-A7, FM-A7A, FMC @ Rd A, FMC Swamp, L3R-1A, L3R-2, McQB at MO, McQB below Z Basin, PB @ Rd A, PB Swamp, SC-2A, SC-4, TB-5, TC-1, U3R-0, U3R-3, and U3R-4), and SRS Stormwater Basin locations (E-001, E-002, E-003, E-004, E-005, E-006, Pond 400, and Z Basin).

Bolded concentration results were reported as detected. Concentrations not bolded indicate the result was less than the analytical method detection limit or the uncertainty is large.

The streams and stormwater basins have the same control locations, TC-1 and U3R-0. The river control location is RM 161.0.

For the river sediment analyses, all results for Co-60, Cm-243/244, Np-237, and Sr-90 were below the detection limit. For the stream sediment, all results for Co-60 were below the detection limit. For the basin sediment, all results for Co-60 and Np-237 were below the detection limit. Therefore, these results are not presented in the sediment tables below.

River Sediment Results

10 River Locations Plus 1 Control

Analyte	Number > DL	Control RM 161.0 (pCi/g)	Location of Maximum Result	Maximum Result (pCi/g)
Americium-241	3 of 10	8.22E-04	RM 150.2	7.50E-03
Cesium-137	7 of 11	5.91E-02	SC RM	1.33E+00
Gross Alpha	11 of 11	1.39E+01	RM 157.2	2.04E+01
Nonvolatile Beta	11 of 11	2.27E+01	RM 134	2.57E+01
Plutonium-238	2 of 10	1.63E-03	RM 129	2.08E-03
Plutonium-239/240	2 of 10	1.82E-03	RM 118.7	5.39E-03
Uranium-233/234	10 of 10	9.14E-01	RM 150.2	1.84E+00
Uranium-235	10 of 10	2.21E-02	RM 150.2	1.05E-01
Uranium-238	10 of 10	1.01E+00	RM 150.2	2.02E+00

Stream Sediment Results

18 Stream Locations Plus 2 Controls (Some locations only sampled for Cs-137, Co-60, gross alpha and nonvolatile beta)

Analyte	Number >DL	Control TC-1 (pCi/g)	Control U3R-0 (pCi/g)	Location of Maximum Result	Maximum Result (pCi/g)
Americium-241	10 of 16	6.36E-03	1.82E-03	FM-A-7A	5.79E-02
Cesium-137	17 of 20	4.39E-02	8.28E-02	Downstream of R-1	5.10E+01
Curium-243/244	6 of 16	1.64E-03	6.58E-03	FM-A-7A	5.14E-02
Gross Alpha	20 of 20	1.57E+01	3.02E+01	TB-5	3.79E+01
Neptunium-237	3 of 16	4.73E-03	1.49E-03	FMC Swamp	5.49E-03
Nonvolatile Beta	20 of 20	1.25E+01	1.78E+01	Downstream of R-1	6.71E+01
Plutonium-238	8 of 16	3.78E-03	1.32E-03	FM-2	4.20E-01
Plutonium-239/240	13 of 16	3.98E-03	4.12E-03	McQB @MO	8.60E-02
Strontium-90	1 of 16	1.32E-01	1.32E-01	FMC Swamp	2.78E-01
Uranium-233/234	16 of 16	1.15E+00	1.26E+00	TB-5	6.22E+00
Uranium-235	15 of 16	4.87E-02	7.33E-02	TB-5	3.23-01
Uranium-238	16 of 16	1.08E+00	1.40E+00	TB-5	6.18E+00

Stormwater Basin Sediment Results

Eight Basin Locations Plus Two Controls

Analyte	Number >DL	Control TC-1 (pCi/g)	Control U3R-0 (pCi/g)	Location of Maximum Result	Maximum Result (pCi/g)
Americium-241	6 of 10	6.36E-03	1.82E-03	Pond 400	3.54E-02
Cesium-137	4 of 10	4.39E-02	8.28E-02	Z Basin	2.06E+03
Curium-243/244	3 of 10	1.64E-03	6.58E-03	Pond 400	5.55-03
Gross Alpha	10 of 10	1.57E+01	3.02E+01	Pond 400	2.72E+01
Nonvolatile Beta	10 of 10	1.25E+01	1.78E+01	Z-Area Basin	1.98E+03
Plutonium-238	4 of 10	3.78E-03	1.32E-03	E-001	2.63E-01
Plutonium-239/240	6 of 10	3.98E-03	4.12E-03	Pond 400	1.78E-01
Strontium-90	2 of 10	1.32E-01	1.32E-01	E-003	7.75E-01
Uranium-233/234	10 of 10	1.15E+00	1.26E+00	Pond 400	2.26E+00
Uranium-235	9 of 10	4.87E-02	7.33E-02	Pond 400	1.03-01
Uranium-238	10 of 10	1.08E+00	1.40E+00	Pond 400	2.11E+00

Appendix Table D-14 Summary of Radionuclides in Drinking Water

Bolded minimum and maximum concentration results were reported as detected. Minimum and maximum concentrations not bolded indicate the result was less than the analytical method detection limit or the uncertainty is large.

Samples at the treatment plants are collected monthly. These samples are analyzed for tritium, Co-60, Cs-137, gross alpha and gross beta. For the treatment plants samples, all results for Co-60, Cs-137, and gross alpha were below detection limits; thus, they are not presented in the table below. Samples are collected at one onsite location quarterly for tritium, Co-60, Cs-137, gross beta and gross alpha analyses, and collected annually for Sr-90 and actinides analyses. All other onsite locations are collected annually. For the quarterly onsite samples, all results for tritium, Co-60, and Cs-137 were below detection limits; thus, they are not presented in the table below. For the onsite annual samples, all results for tritium, Co-60, Cs-137, Sr-90, U-235, Pu-239, and Cm-244 were below detection limits; thus, they are not presented in the table below.

Treatment Plants—Finished Water Summary

Tritium					
Locations	Number of Samples	Number of Detects	Mean Concentration (pCi/L)	Minimum Concentration (pCi/L)	Maximum Concentration (pCi/L)
BJWSA Purrysburg WTP	12	7	2.29E+02	6.11E+01	4.11E+02
North Augusta Public Water Works	12	1	1.39E+02	-6.73E+00	3.22E+02

Gross Beta					
Locations	Number of Samples	Number of Detects	Mean Concentration (pCi/L)	Minimum Concentration (pCi/L)	Maximum Concentration (pCi/L)
BJWSA Purrysburg WTP	12	12	1.82E+00	1.32E+00	2.33E+00
North Augusta Public Water Works	12	12	1.76E+00	1.45E+00	2.27E+00

Onsite Location Summary—Quarterly Samples

Gross Beta					
Location	Number of Samples	Number of Detects	Mean Concentration (pCi/L)	Minimum Concentration (pCi/L)	Maximum Concentration (pCi/L)
782-3A quarterly	4	4	8.82E-01	5.54E-01	1.14E+00

Gross Alpha					
Location	Number of Samples	Number of Detects	Mean Concentration (pCi/L)	Minimum Concentration (pCi/L)	Maximum Concentration (pCi/L)
782-3A quarterly	4	2	3.50E-01	2.47E-01	5.49E-01

Onsite Location Summary—Annual Samples

Location	Number of Samples	U-234 Concentration (pCi/L)	U-238 Concentration (pCi/L)	Pu-238 Concentration (pCi/L)	Am-241 Concentration (pCi/L)
617-8G	1	2.70E-02	2.19E-02	1.18E-02	5.30E-03
681-3G Dom. Water Faucet	1	1.75E-02	2.16E-02	1.68E-03	1.29E-02
704-16G	1	1.21E-02	1.05E-02	1.02E-02	1.71E-02
709-1G	1	2.59E-02	2.49E-02	1.16E-03	2.86E-03
737-G	1	1.78E-02	1.36E-02	5.46E-04	1.02E-02
782-3A (annual)	1	2.34E-02	7.08E-02	5.32E-04	8.43E-03
905-112G Well	1	3.95E-02	4.73E-02	-2.78E-03	4.92E-03
905-113G Well	1	3.35E-02	2.32E-02	2.20E-03	5.46E-03
905-125B	1	1.88E-02	3.30E-02	1.78E-03	3.57E-03
905-67B	1	1.15E-02	1.69E-02	-1.22E-03	8.30E-03

Onsite Location Summary—Annual Samples (continued)

Location	Number of Samples	Gross Beta	Gross Alpha
		Concentration (pCi/L)	Concentration (pCi/L)
617-8G	1	8.11E-01	3.27E-01
681-3G Dom. Water Faucet	1	2.51E+00	1.16E-01
704-16G	1	1.36E+00	1.27E+00
709-1G	1	1.22E+00	3.00E-01
737-G	1	1.31E+00	-1.27E-02
782-3A (annual)	1	9.90E-01	3.80E-01
905-112G Well	1	1.51E+00	7.57E-01
905-113G Well	1	1.66E+00	1.41E+00
905-125B	1	6.97E-01	9.24E-01
905-67B	1	1.33E+00	1.81E+00

Appendix Table D-15 Summary of Radionuclides in Freshwater Fish

Bolded minimum and maximum concentration results were reported as detected. Minimum and maximum concentrations not bolded indicate the result was less than the analytical method detection limit or the uncertainty is large. Sr-89/90 is the only analysis performed in both flesh (edible) and bone (nonedible) samples. All Co-60, I-129, and gross alpha results were nonsignificant and, thus, not reported in this table.

The analyte mean is set to zero if all composite values per fish species at a single location are less than the MDL or the uncertainty is large. Three composite samples were analyzed for each fish type from each location.

Cs-137 (Edible)									
Location	Bass			Catfish			PanFish		
	Mean (pCi/g)	Minimum (pCi/g)	Maximum (pCi/g)	Mean (pCi/g)	Minimum (pCi/g)	Maximum (pCi/g)	Mean (pCi/g)	Minimum (pCi/g)	Maximum (pCi/g)
Augusta L&D	1.15E-02	8.62E-03	1.68E-02	2.68E-02	1.96E-02	4.00E-02	1.40E-02	3.78E-03	2.01E-02
Upper Three Runs Creek River Mouth	2.36E-02	1.13E-02	4.19E-02	2.05E-02	9.51E-03	4.11E-02	2.11E-02	5.16E-03	3.05E-02
Four Mile Creek River Mouth	9.48E-02	5.05E-02	1.55E-01	5.63E-02	2.24E-02	1.17E-01	4.24E-02	1.36E-02	7.00E-02
Steel Creek River Mouth	8.59E-02	4.43E-02	1.28E-01	9.98E-02	4.46E-02	1.37E-01	6.34E-02	4.70E-02	8.03E-02
Lower Three Runs Creek River Mouth	1.92E-01	4.59E-02	4.38E-01	7.57E-02	5.86E-02	1.05E-01	3.58E-02	1.72E-02	6.70E-02
Hwy 301 Bridge Area	2.34E-02	1.89E-02	2.73E-02	1.96E-02	1.81E-02	2.15E-02	1.79E-02	1.38E-02	2.34E-02

Sr-89/90 (Edible)									
Location	Bass			Catfish			Panfish		
	Mean (pCi/g)	Minimum (pCi/g)	Maximum (pCi/g)	Mean (pCi/g)	Minimum (pCi/g)	Maximum (pCi/g)	Mean (pCi/g)	Minimum (pCi/g)	Maximum (pCi/g)
Augusta L&D	3.14E-03	7.35E-04	4.51E-03	0.00E+00	-3.16E-04	2.34E-03	0.00E+00	4.73E-04	2.31E-03
Upper Three Runs Creek River Mouth	0.00E+00	1.32E-03	3.05E-03	0.00E+00	2.33E-04	1.34E-03	0.00E+00	-1.52E-03	3.11E-03
Four Mile Creek River Mouth	2.74E-03	2.18E-03	3.08E-03	0.00E+00	5.97E-04	1.43E-03	3.18E-03	2.35E-03	4.43E-03
Steel Creek River Mouth	2.46E-03	1.48E-03	3.41E-03	0.00E+00	-5.73E-04	2.73E-03	0.00E+00	4.76E-05	2.46E-03
Lower Three Runs Creek River Mouth	0.00E+00	2.20E-03	2.56E-03	0.00E+00	4.89E-04	1.94E-03	5.46E-03	2.20E-03	8.97E-03
Hwy 301 Bridge Area	0.00E+00	1.13E-03	2.22E-03	1.85E-03	8.59E-04	2.62E-03	4.83E-03	3.59E-03	7.08E-03

Sr-89/90 (Nonedible)									
Location	Bass			Catfish			Panfish		
	Mean (pCi/g)	Minimum (pCi/g)	Maximum (pCi/g)	Mean (pCi/g)	Minimum (pCi/g)	Maximum (pCi/g)	Mean (pCi/g)	Minimum (pCi/g)	Maximum (pCi/g)
Augusta L&D	5.33E-01	3.43E-01	7.19E-01	6.50E-01	5.30E-01	7.51E-01	8.77E-01	7.46E-01	1.01E+00
Upper Three Runs Creek River Mouth	8.30E-01	6.51E-01	9.35E-01	7.54E-01	5.70E-01	9.73E-01	6.78E-01	5.27E-01	8.16E-01
Four Mile Creek River Mouth	2.04E+00	1.12E+00	2.92E+00	7.94E-01	4.73E-01	9.86E-01	8.70E-01	7.43E-01	1.07E+00
Steel Creek River Mouth	8.16E-01	6.51E-01	9.43E-01	7.44E-01	5.78E-01	8.54E-01	8.39E-01	6.95E-01	9.35E-01
Lower Three Runs Creek River Mouth	5.38E-01	4.16E-01	6.22E-01	7.11E-01	6.32E-01	7.68E-01	8.18E-01	7.14E-01	8.76E-01
Hwy 301 Bridge Area	6.59E-01	5.86E-01	7.65E-01	7.80E-01	6.65E-01	8.51E-01	9.65E-01	9.16E-01	1.04E+00

Tc-99 (Edible)									
Location	Bass			Catfish			Panfish		
	Mean (pCi/g)	Minimum (pCi/g)	Maximum (pCi/g)	Mean (pCi/g)	Minimum (pCi/g)	Maximum (pCi/g)	Mean (pCi/g)	Minimum (pCi/g)	Maximum (pCi/g)
Augusta L&D	0.00E+00	3.81E-02	5.41E-02	5.65E-02	3.32E-02	7.22E-02	0.00E+00	5.22E-02	5.65E-02
Upper Three Runs Creek River Mouth	0.00E+00	-1.48E-02	7.32E-02	0.00E+00	3.84E-02	7.24E-02	0.00E+00	-2.10E-02	6.19E-02
Four Mile Creek River Mouth	0.00E+00	-4.49E-02	5.27E-02	0.00E+00	-7.62E-03	7.14E-03	0.00E+00	-1.68E-02	2.04E-02
Steel Creek River Mouth	5.86E-02	4.03E-02	8.49E-02	0.00E+00	5.35E-03	3.78E-02	0.00E+00	3.62E-02	6.03E-02
Lower Three Runs Creek River Mouth	0.00E+00	1.53E-02	6.14E-02	0.00E+00	3.11E-02	6.68E-02	0.00E+00	-8.59E-03	3.70E-02
Hwy 301 Bridge Area	9.48E-02	5.22E-02	1.39E-01	8.02E-02	6.24E-02	1.15E-01	9.99E-02	8.97E-02	1.19E-01

Gross Beta (Edible)									
Location	Bass			Catfish			Panfish		
	Mean (pCi/g)	Minimum (pCi/g)	Maximum (pCi/g)	Mean (pCi/g)	Minimum (pCi/g)	Maximum (pCi/g)	Mean (pCi/g)	Minimum (pCi/g)	Maximum (pCi/g)
Augusta L&D	2.09E+00	1.91E+00	2.22E+00	2.12E+00	2.01E+00	2.34E+00	1.59E+00	1.35E+00	1.95E+00
Upper Three Runs Creek River Mouth	2.37E+00	2.11E+00	2.51E+00	2.45E+00	2.18E+00	2.62E+00	2.08E+00	1.84E+00	2.41E+00
Four Mile Creek River Mouth	1.93E+00	1.89E+00	1.98E+00	1.74E+00	1.36E+00	2.22E+00	1.67E+00	1.52E+00	1.82E+00
Steel Creek River Mouth	2.66E+00	2.46E+00	2.76E+00	2.45E+00	2.01E+00	2.86E+00	2.25E+00	2.18E+00	2.31E+00
Lower Three Runs Creek River Mouth	1.90E+00	1.66E+00	2.27E+00	1.89E+00	1.72E+00	2.07E+00	1.32E+00	1.16E+00	1.61E+00
Hwy 301 Bridge Area	2.30E+00	1.86E+00	3.14E+00	2.03E+00	1.94E+00	2.22E+00	1.40E+00	1.15E+00	1.53E+00

Appendix Table D-16 Summary of Radionuclides in Saltwater Fish

Bolded minimum and maximum concentration results were reported as detected. Minimum and maximum concentrations not bolded indicate the result was less than the analytical method detection limit or the uncertainty is large. Sr-89/90 is the only analysis performed in both flesh (edible) and bone (nonedible) samples. Results of all samples for Co-60, Cs-137, I-129, Sr-89/90 (in flesh), and gross alpha were below method detection limits.

All saltwater fish are collected at the location designated as River Miles 0–8 (mouth of Savannah River).

Marine Mullet					
Analyte	Number of Samples	Number of Results > Detection Limit	Mean (pCi/g)	Minimum (pCi/g)	Maximum (pCi/g)
Tc-99	3	1	7.25E-02	6.95E-02	7.62E-02
Sr-89/90 Nonedible	3	2	3.22E-01	2.76E-01	3.46E-01
Gross Beta	3	3	2.59E+00	2.36E+00	2.70E+00

Appendix Table D-17 Summary of Radionuclides in Shellfish

Bolded minimum and maximum concentration results were reported as detected. Minimum and maximum concentrations not bolded indicate the result was less than the analytical method detection limit or the uncertainty is large. All Co-60, Cs-137, I-129, Tc-99, Sr-89/90, and gross alpha results were not detected; thus, they were not reported in this table.

All shellfish are collected at the location designated as River Miles 0-8 (at the mouth of Savannah River).

The species of shellfish collected in 2019 were shrimp and crab.

Nuclide	Number of Samples	Number of Results > Detection Limit	Mean Concentration (pCi/g)	Minimum Concentration (pCi/g)	Maximum Concentration (pCi/g)
Gross B	2	2	1.22E+00	9.57E-01	1.49E+00

Appendix Table D-18 Summary of Radionuclides in Wildlife

Bolded concentration results were reported as detected. Minimum and maximum concentrations not bolded indicate the result was less than the analytical method detection limit or the uncertainty is large. All Co-60 results were below detection limits and, thus, are not reported in this table.

Sample Type	Nuclide	Number of Samples	Number of Results > Detection Limit	Mean Sample Concentration (pCi/g)	Minimum Sample Concentration (pCi/g)	Maximum Sample Concentration (pCi/g)
Deer Flesh	Cs-137	26	26	6.98E-01	2.73E-01	1.35E+00
Hog Flesh	Cs-137	6	6	6.77E-01	3.41E-02	2.06E+00
Alligator Flesh	Cs-137	1	1	1.54E-01	1.54E-01	1.54E-01
Deer Flesh	Sr-89/90	26	1	1.57E-03	-2.10E-03	5.41E-03
Hog Flesh	Sr-89/90	6	0	1.10E-03	-1.74E-03	4.05E-03
Deer Bone	Sr-89/90	26	26	3.16E+00	1.15E+00	6.32E+00
Hog Bone	Sr-89/90	6	6	1.96E+00	7.24E-01	3.73E+00