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.

Radioactive Atmospheric Releases by Source (Curies[a])

Radionuclide	Half-Life[b]		Calculated[c]	Reactors	Separations[d]	SRNL	Total
Gases and Vapors							
H-3 (oxide)	12.3	y	1.54E+02	7.43E+02	6.61E+03		7.51E+03
H-3 (elemental)	12.3	y			1.60E+03		1.60E+03
H-3 Total	12.3	y	1.54E+02	7.43E+02	8.21E+03		9.11E+03
C-14	5700	y	1.04E-05		6.20E-02		6.20E-02
Hg-203	46.6	d	5.26E-10				5.26E-10
Kr-85	10.8	y			1.68E+04		1.68E+04
I-129	1.57E+07	y	1.58E-05		5.56E-03	6.19E-07	5.57E-03
I-131	8.02	r	7.10E-10				7.10E-10
Particles							
Ag-110m	250	d	1.48E-11				1.48E-11
Am-241	432	y	1.67E-05	0.00E+00	7.00E-06		2.37E-05
Am-243	7370	y	3.61E-07				3.61E-07
Ba-133	10.5	y	6.55E-07				6.55E-07
Cd-109	461	d	1.36E-08				1.36E-08
Ce-139	138	d	5.18E-10				5.18E-10
Ce-141	32.5	d	4.94E-11				4.94E-11
Ce-144	285	d	2.00E-08				2.00E-08
Cm-243	29.1	y	2.98E-07	0.00E+00	1.90E-08		3.17E-07
Cm-244	18.1	y	4.95E-10				4.95E-10
Co-57	272	d	3.39E-06	0.00E+00	0.00E+00	0.00E+00	3.39E-06
Co-60	5.27	y	4.31E-07				4.31E-07
Cs-134	2.06	y	3.51E-03	0.00E+00	4.72E-03	0.00E+00	8.23E-03
Cs-137	30.2	y	9.21E-09				9.21E-09
Eu-152	13.5	y	7.11E-07				7.11E-07
Eu-154	8.59	y	1.18E-07				1.18E-07
Eu-155	4.76	y	1.00E-02				1.00E-02
Fe-55	2.74	y	3.76E-08				3.76E-08
Mn-54	312	d	4.55E-10				4.55E-10
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	3.67E-07				3.67E-07

Radioactive Atmospheric Releases by Source (Curies)[a] (continued)

Radionuclide	Half-Life[b]		Calculated[c]	Reactors	Separations[d]	SRNL	Total
Ni-63	100	y	4.55E-05				4.55E-05
Np-237	2.14E+06	y	1.54E-06	0.00E+00	1.30E-07		1.68E-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	4.56E-10				4.56E-10
Pu-238	87.7	y	3.19E-05	0.00E+00	3.65E-06		3.56E-05
Pu-239	2.41E+04	y	8.20E-05	0.00E+00	8.10E-05		1.63E-04
Pu-240	6560	y	2.54E-05				2.54E-05
Pu-241	14.4	y	2.37E-04				2.37E-04
Pu-242	3.75E+05	y	2.68E-05				2.68E-05
Ra-226	1600	y	4.04E-07				4.04E-07
Ra-228	5.75	y	4.07E-07				4.07E-07
Rh-106[(e)]	29.8	s	3.04E-06				3.04E-06
Ru-103	39.3	d	5.11E-10				5.11E-10
Ru-106	374	d	3.04E-06				3.04E-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	6.30E-10				6.30E-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	5.82E-10				5.82E-10
Sr-89	50.5	d	5.40E-10				5.40E-10
Sr-90	28.8	y	2.85E-03	0.00E+00	1.51E-05		2.87E-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	1.17E-08	3.35E-09			1.51E-08
Th-229	7340	y	1.23E-09				1.23E-09
Th-230	7.54E+04	y	7.87E-11	4.99E-09			5.06E-09
Th-231	25.5	h	2.12E-04				2.12E-04
Th-232	1.41E+10	y	4.29E-12	2.68E-09			2.69E-09

Radioactive Atmospheric Releases by Source (Curies)[a] (continued)

Radionuclide	Half-Life[b]		Calculated[c]	Reactors	Separations[d]	SRNL	Total
Tl-208	3.05	m	1.41E-06				1.41E-06
U-232	68.9	y	5.35E-09				5.35E-09
U-233	1.59E+05	y	2.89E-08				2.89E-08
U-234	2.46E+05	y	5.02E-07	3.68E-09	3.12E-05		3.17E-05
U-235	7.04E+08	y	2.73E-08	0.00E+00	1.81E-06		1.83E-06
U-236	2.34E+07	y	3.01E-08				3.01E-08
U-238	4.47E+09	y	4.48E-07	3.41E-09	3.98E-05		4.03E-05
Y-88	107	d	5.18E-10				5.18E-10
Y-90[e]	64.1	h	2.85E-03	0.00E+00	1.51E-05		2.87E-03
Y-91	58.5	d	7.98E-10				7.98E-10
Zn-65	244	d	9.41E-10				9.41E-10
Zr-95	64.0	d	1.22E-07				1.22E-07
Unidentified alpha	N/A		3.00E-05	4.34E-06	1.90E-06	2.55E-06	3.88E-05
Unidentified beta	N/A		8.56E-04	4.13E-05	1.16E-04	4.91E-06	1.02E-03
TOTAL	**N/A**		**1.54E+02**	**7.43E+02**	**2.50E+04**	**8.08E-06**	**2.59E+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), hours (h), 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; therefore, they were 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 U.S. Department of Energy (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	1.06E-04	1.06E-04
C Area (C-Area Main Stack)	H-3 (oxide)	1.31E-01	0.00E+00
F Area (235-F Sandfilter Discharge)	U-234, U-238, Am-241	1.99E-03	1.99E-03
F Area (291-F Stack Isokinetic)	I-129, Cs-137, U-234, U-235, Np-237, U-238, Pu-238, Pu-239, Am-241, Cm-244	2.47E+00	2.47E+00
F Area (772-4F Stack)	U-234, U-238, Pu-239, Am-241	7.72E-04	7.72E-04
H Area (291-H Stack Isokinetic)	H-3 (oxide), C-14, Kr-85, I-129, Cs-137, U-234, U-235, U-238, Pu-238, Pu-239, Am-241, Cm-244	6.66E-02	6.66E-02
K Area (K-Area Main Stack)	H-3 (oxide)	1.31E+00	0.00E+00
L Area (L-Area Disassembly)	H-3 (oxide)	1.35E+00	0.00E+00
L Area (L-Area Main Stack)	H-3 (oxide)	1.32E+00	0.00E+00
Tritium (232-H)	H-3 (elemental), H-3 (oxide)	1.91E+01	0.00E+00
Tritium (233-H)	H-3 (elemental), H-3 (oxide)	3.90E+00	0.00E+00
Tritium (234-H)	H-3 (oxide)	4.00E+00	0.00E+00
Tritium (238-H)	H-3 (oxide)	1.16E-01	0.00E+00
Tritium (264-H)	H-3 (elemental), H-3 (oxide)	1.37E+01	0.00E+00

Appendix Table D-3 Summary of Tritium in Environmental Air

Samples were collected approximately every 2 weeks at each of the 15 locations, with site A-14 being added in October and totaling 16 sites. One sample was invalidated at site Burial Ground North in April due to unexpected power loss. 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 (A-14 and Barnwell Gate) and 25-Mile Radius (Augusta Lock & Dam and Aiken Airport). 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	3.53E+02	**9.00E+01**	**7.62E+02**
Site Perimeter				
Allendale Gate	1 of 26	4.15E+00	-7.95E+00	2.67E+01
Barricade 8	4 of 26	5.31E+00	-2.52E+00	**1.98E+01**
D Area	5 of 26	6.49E+00	-3.46E+00	**2.12E+01**
Darkhorse @ Williston Gate	3 of 26	3.93E+00	-2.17E+00	**1.43E+01**
East Talatha	1 of 26	3.36E+00	-6.24E+00	1.08E+01
Green Pond	1 of 26	4.67E+00	-2.42E+00	1.26E+01
Highway 21/167	2 of 26	3.65E+00	-3.68E+00	**1.24E+01**
Jackson	3 of 26	4.96E+00	-2.24E+00	**2.36E+01**
Patterson Mill Road	1 of 26	3.02E+00	-3.95E+00	1.47E+01
Talatha Gate	5 of 26	6.44E+00	-1.87E+00	**2.48E+01**
25-Mile Radius				
Highway 301	1 of 26	2.05E+00	-6.92E+00	**1.88E+01**

Appendix Table D-4 Summary of Tritium in Rainwater

Samples were collected approximately every 4 weeks at each of the 15 air surveillance locations, with site A-14 being added in October and totaling 16 sites. 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 (A-14, Allendale Gate, Darkhorse @ Williston Gate, East Talatha, Green Pond, Patterson Mill Road, and Talatha Gate) and 25-Mile Radius (Augusta Lock & Dam, Aiken Airport, and Highway 301 @ State Line). The Highway 301 @ State Line location is the control location. Burial Ground North, Barricade 8, and D Area had special samples pulled in November as a precaution due to open glovebox work at the Tritium Facility.

Location	Number of Detected Results	Mean Concentration (pCi/L)	Minimum Concentration (pCi/L)	Maximum Concentration (pCi/L)
Onsite				
Burial Ground North	14 of 14	4.88E+03	**6.41E+02**	**2.86E+04**
Barnwell Gate	1 of 13	3.19E+01	-1.52E+02	**4.35E+02**
Barricade 8	4 of 14	2.09E+02	-1.13E+02	**6.38E+02**
D Area	3 of 14	2.35E+02	-1.61E+02	**1.22E+03**
Hwy 21/167	1 of 13	6.39E+01	-1.11E+02	**3.81E+02**
Jackson	2 of 13	1.50E+02	-1.17E+02	**7.03E+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 15 locations, with site A-14 being added in October and totaling 16 sites. Samples from all locations were analyzed biweekly for gamma emitting radionuclides, gross alpha, and gross beta. The onsite location 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, the sample collected January 27 to February 10 is missing results for strontium-89,90, the sample collected February 24 to March 10 is missing all analytes, samples collected from April 21 to May 5 were invalidated due to a pump failure, and samples collected March 24 to April 21 are missing strontium-89,90 and plutonium-238/239 at Burial Ground North.

One sample from every perimeter location and 25-mile radius location was chosen for actinide and strontium-89,90 (Sr-89,90) analysis based on elevated releases at F-Area stacks during 2021. Highway 301 @ State Line used three samples since it was the control location and the three different sampling time periods were utilized.

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	393 of 394	Highway 21/167	7.08E-05	D-Area	**5.76E-03**
Gross Beta	394 of 394	Highway 21/167	**1.23E-03**	Talatha Gate	**3.03E-02**

Cm-244 and U-235 results were not detected for site Burial Ground North; therefore, they were not reported in the table Biweekly Actinide and Strontium-89,90 Samples.

Biweekly Actinide and Strontium-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)
Sr-89,90	1 of 21	1.55E-04	-9.08E-05	**5.35E-04**
U-234	24 of 24	2.54E-05	**1.32E-05**	**4.97E-05**
U-238	24 of 24	2.09E-05	**1.04E-05**	**3.05E-05**
Pu-238	1 of 22	1.07E-06	-1.33E-06	**1.05E-05**
Pu-239	1 of 22	1.03E-06	-2.43E-06	4.81E-06
Am-241	4 of 23	4.61E-06	1.87E-07	**1.33E-05**

U-235, Pu-238, Sr-89,90, and Cm-244 results were not detected for the annual sites; therefore, they were not reported in the table Annual Actinide and Strontium-89,90 Samples.

Appendix Table D-5 Summary of Radionuclides in Environmental Air (continued)

Annual Actinide and Strontium-89,90 Samples

		U-234	U-238	Am-241	Pu-239
Location	**Number of Samples**	**Concentration (pCi/m^3)**	**Concentration (pCi/m^3)**	**Concentration (pCi/m^3)**	**Concentration (pCi/m^3)**
A-14	1	**1.55E-05**	**1.90E-05**	2.44E-06	-1.72E-06
Allendale Gate	1	**4.38E-05**	**1.87E-05**	1.29E-05	-2.06E-06
Barnwell Gate	1	**2.76E-05**	**1.59E-05**	3.30E-06	-8.54E-08
Barricade 8	1	**1.45E-05**	**1.21E-05**	**5.59E-06**	-1.26E-06
D Area	1	**2.76E-05**	**1.80E-05**	3.59E-06	**2.09E-05**
Darkhorse @ Williston Gate	1	**3.51E-05**	**2.66E-05**	**8.78E-06**	1.25E-06
East Talatha	1	**3.22E-05**	**2.41E-05**	8.16E-07	3.00E-07
Green Pond	1	**1.93E-05**	**2.84E-05**	**7.14E-06**	0.00E+00
Highway 21/167	1	**1.48E-05**	**9.73E-06**	**8.11E-06**	-3.57E-07
Jackson	1	**1.86E-05**	**2.34E-05**	3.27E-06	-6.30E-07
Patterson Mill Road	1	**2.23E-05**	**2.23E-05**	7.57E-06	-9.89E-08
Talatha Gate	1	**2.18E-05**	**2.44E-05**	4.89E-06	-1.04E-07
Aiken Airport	1	**1.96E-05**	**1.79E-05**	1.64E-06	-9.62E-07
Augusta Lock and Dam 614	1	**1.94E-05**	**2.20E-05**	2.68E-06	0.00E+00
Highway 301 @ State Line (Control Location)	3	**3.14E-05**	**2.11E-05**	**5.65E-06**	-1.90E-06
		1.47E-05	**1.97E-05**	**8.86E-06**	0.00E+00
		1.41E-05	**1.58E-05**	**7.16E-06**	6.41E-07

Appendix Table D-6 Summary of Gamma Surveillance

Samples were collected approximately every quarter (12 weeks) at each of the 51 locations. Typically, two samples are collected from each location. This was the case in 2021 except for Site Perimeter location PP-65, which was missing one sample for the fourth-quarter, and Population Center locations Girard and McBean, where Girard was missing one sample during the retrieval of the first-quarter samples and McBean was missing one third-quarter sample. Also, SRS was not able to retrieve any OSLDs for Plant Vogtle Vicinity locations GAP_4H and GAP_4L during the first quarter and NRC_5 during the fourth quarter. Please reference Environmental Maps, SRS Optically Stimulated Luminescent Dosimeter [OSLD] Sampling Locations.

Station Location Type	Number 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	0.39	0.37	0.38	0.44	141	100	165
Site Perimeter	9	0.34	0.30	0.29	0.38	119	101	135
Air Surveillance Stations	15	0.33	0.31	0.31	0.40	123	93	154
Plant Vogtle Vicinity	18	0.31	0.29	0.30	0.37	112	76	136

Appendix D-7 Summary of Radionuclides in Soil

Soil samples were collected from 19 locations in 2021. 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: F Area (2,000 feet West), H Area (2,000 feet East), Z Area (#3), Burial Ground Locations (643-26E-2 and Burial Ground North), Plant Perimeter Locations (Allendale Gate, Barnwell Gate, Barricade 8, 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.

All Co-60, Sr 89,90, and Np-237 results were not detected; therefore, they were not reported in this table.

Radionuclide	Number 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	17 of 19	**1.15E-01**	Burial Ground (643-26E-2)	-1.43E-02	Aiken Airport	**3.38E-01**
U-234	19 of 19	**1.50E+00**	Barricade 8	**2.86E-01**	Augusta Lock and Dam 614	**1.32E+00**
U-235	19 of 19	**7.19E-02**	Highway 21/167	**1.20E-02**	Augusta Lock and Dam 614	**7.14E-02**
U-238	19 of 19	**1.49E+00**	Barricade 8	**2.35E-01**	Augusta Lock and Dam 614	**1.41E+00**
Pu-238	5 of 19	-3.22E-04	Burial Ground North	-1.82E-04	F Area (2000 feet west)	**5.11E-02**
Pu-239	17 of 19	**7.35E-03**	Burial Ground North	**1.09E-03**	F Area (2000 feet west)	**1.43E-01**
Am-241	15 of 19	**4.27E-03**	Green Pond	8.11E-04	F Area (2000 feet west)	**1.41E-02**
Cm-244	2 of 19	4.32E-04	Barricade 8	-1.99E-04	Jackson	**4.57E-03**
Gross Beta	17 of 19	**1.21E+01**	Patterson Mill Road	1.49E+00	Augusta Lock and Dam 614	**1.27E+01**
Gross Alpha	18 of 19	**1.06E+01**	Barricade 8	7.24E-01	Augusta Lock and Dam 614	**1.44E+01**

Appendix Table D-8 Summary of Radionuclides in Grassy Vegetation

Samples are collected annually from 15 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, Pu-238, Cm-244, and Tc-99 were not detected; therefore, they were not reported in this table.

The following locations are sampled: Onsite location (Burial Ground North), Site Perimeter locations (Allendale Gate, Barnwell Gate, Barricade 8, 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, Augusta Lock and Dam 614, and Highway 301 @ State Line). Highway 301 @ State Line is the control location.

Radionuclide	Number 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	6 of 15	2.57E-02	Darkhorse @ Williston Gate	2.97E-03	Burial Ground North	**1.03E+00**
Cs-137	11 of 17	**2.67E-01**	Darkhorse @ Williston Gate	-1.82E-03	Allendale Gate	**6.16E-01**
Sr-89,90	11 of 15	**6.89E-02**	Darkhorse @ Williston Gate	3.32E-02	Patterson Mill Road	**3.92E-01**
U-234	14 of 15	**1.38E-03**	Darkhorse @ Williston Gate	1.22E-03	Highway 21/167	**2.04E-02**
U-235	1 of 15	2.81E-04	Allendale Gate	-2.42E-04	Talatha Gate	**8.35E-04**
U-238	14 of 15	**1.21E-03**	Darkhorse @ Williston Gate	1.60E-03	Highway 21/167	**1.90E-02**
Np-237	3 of 15	1.13E-04	Highway 21/167	-1.00E-04	Green Pond	**9.38E-04**
Pu-239	1 of 15	3.11E-05	Jackson	-1.94E-04	Barricade 8	**1.12E-03**
Am-241	1 of 15	6.40E-04	Highway 21/167	-1.40E-04	Augusta Lock & Dam 614	6.41E-04
Gross Beta	15 of 15	**5.08E+00**	Green Pond	**2.70E+00**	Barricade 8	**1.42E+01**
Gross Alpha	1 of 15	-1.13E-01	Barnwell Gate	-1.26E-01	East Talatha	**1.02E+00**

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. Pecans and corn were the rotational crop samples for 2021. However, no pecans were collected due to poor crop production. 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	Gross Beta	5	5	2.75E+00	**2.26E+00**	**3.97E+00**
	H-3	5	1	3.24E-02	-2.42E-03	**9.08E-02**
	Pu-239	5	1	5.82E-06	-1.35E-05	5.57E-05
	U-234	5	1	3.03E-05	2.20E-06	**6.62E-05**
Am-241, Cm-244, Co-60, Cs-137, Gross Alpha, Np-237, Pu-238, Sr-89,90, Tc-99, U-235 and U-238 were not detected in beef.						
Greens	Cs-137	5	4	2.55E-02	1.52E-02	**3.35E-02**
	Gross Beta	5	5	2.12E+01	**1.64E+01**	**2.84E+01**
	Pu-239	5	1	3.21E-04	7.43E-05	**5.59E-04**
	Sr-89,90	5	4	1.18E-01	3.16E-02	**3.57E-01**
	Tc-99	5	5	5.54E-01	**2.15E-01**	**8.78E-01**
	U-234	5	4	1.38E-02	8.81E-04	**2.57E-02**
	U-235	5	2	5.61E-04	0.00E+00	**9.73E-04**
	U-238	5	5	1.44E-02	**2.48E-03**	**2.73E-02**
Am-241, Cm-244, Co-60, Gross Alpha, H-3, Np-237, and Pu-238 were not detected in greens.						
Fruit (watermelon)	Gross Beta	5	4	1.30E-01	4.16E-02	**2.19E-01**
	U-234	5	1	6.77E-05	3.11E-05	**9.68E-05**
Am-241, Cm-244, Co-60, Cs-137, Gross Alpha, H-3, Np-237, Pu-238, Pu-239, Sr-89,90, Tc-99, U-234, U-235, and U-238 were not detected in fruit.						
Corn	Cs-137	5	2	9.98E-03	2.43E-03	**2.50E-02**
	Gross Beta	5	5	9.60E+00	**8.38E+00**	**1.23E+01**
Am-241, Cm-244, Co-60, Gross Alpha, H-3, Np-237, Pu-238, Pu-239, Sr-89,90, Tc-99, U-234, U-235, and U-238 were not detected in peanuts.						

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 and H-3 results were not detected; therefore, they were 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	Cs-137	16	5	2.62E+00	-4.27E-01	**1.08E+01**
SC–Dairies (4) Cow Milk	Sr-90	16	4	6.43E-01	-4.57E-01	**3.03E+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, and 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; therefore, 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]	12.3	y	1.17E+02	3.65E+02	0.00E+00	4.83E+02
C-14	5,700	y		5.80E-04	0.00E+00	5.80E-04
Mn-54	8.56E-01	y		9.70E-06		9.70E-06
Co-58	1.94E-01	y		1.61E-04		1.61E-04
Sr-90	28.8	y	0.00E+00	2.15E-02		2.15E-02
Tc-99	2.11E+05	y		3.42E-02	0.00E+00	3.42E-02
I-129	1.57E+07	y		2.19E-02	0.00E+00	2.19E-02
Cs-137[e]	30.2	y	0.00E+00	2.37E-02	0.00E+00	2.37E-02
U-234	2.46E+05	y		3.27E-02	1.32E-04	3.28E-02
U-235	7.04E+08	y		3.72E-04	1.31E-05	3.85E-04
U-238	4.47E+09	y		3.32E-02	1.33E-04	3.34E-02
Np-237	2.14E+06	y		1.17E-04		1.17E-04
Pu-238	87.7	y		3.97E-04	8.43E-07	3.98E-04
Pu-239	2.41E+04	y		2.01E-05	0.00E+00	2.01E-05
Am-241	432	y		3.18E-05		3.18E-05
Cm-244	18.1	y		1.46E-04		1.46E-04
Alpha [f]	N/A		3.88E-03	1.74E-03	5.97E-04	6.22E-03
Beta-Gamma [g]	N/A		4.53E-02	6.36E-03	9.99E-04	5.27E-02
					Sum	**4.83E+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)	H-3, Tc-99, C-14, Co-60, I-129, Cs-137, U-234, U-235, U-238, Pu-238, Pu-239	1.56E-03	1.52E-03
F Area (F-013 200-F Cooling Basin)	H-3, Tc-99, Co-60, I-129, Cs-137, U-234, U-235, U-238, Np-237, Pu-238, Pu-239, Am-241, Cm-244, Sr-89,90	4.90E-03	4.52E-03
F Area (F-05)	H-3, Tc-99, C-14, Co-60, I-129, Cs-137, U-234, U-235, U-238, Np-237, Pu-238, Pu-239, Am-241, Cm-244, Sr-89,90	6.14E-03	5.84E-03
F Area (FM-3 F-Area Effluent)	H-3, Tc-99, C-14, Co-60, I-129, Cs-137, U-234, U-235 U-238, Np-237, Pu-238, Pu-239, Am-241, Cm-244, Sr-89,90	1.93E-03	1.54E-03
F-Tank Farm (F-012 281-8F Retention Basin)	H-3, Tc-99, Co-60, I-129, Cs-137, U-234, U-235, U-238, Np-237, Pu-238, Pu-239, Am-241, Cm-244, Sr-89,90	1.08E-02	1.03E-02
G-010 (Central Sanitary Wastewater Treatment Facility)	H-3, Tc-99, Co-60, I-129, Cs-137, U-234, U-235, U-238, Pu-238, Pu-239, Am-241, Cm-244, Sr-89,90	1.15E-02	1.10E-02
H Area (FM-1C H-Area Effluent)	H-3, C-14, Co-60, Cs-137, U-234, U-235, U-238, Np-237, Pu-238, Pu-239, Am-241, Cm-244, Sr-89,90	3.48E-03	2.56E-03
H Area (H-004)	H-3, Co-60, Cs-137, U-234, U-235, U-238, Pu-238, Pu-239, Sr-89,90	7.77E-03	3.57E-03
H-ETP (U3R-2A ETP Outfall)	H-3, C-14, Co-60, Cs-137, U-234, U-235, U-238, Np-237, Pu-238, Pu-239, Am-241, Cm-244, Sr-89,90	1.24E+00	1.25E-01
H-Tank Farm (H-017 281-8H Retention Basin)	H-3, Tc-99, Co-60, I-129, Cs-137, U-234, U-235, U-238, Np-237, Pu-238, Pu-239, Am-241, Cm-244, Sr-89,90	1.00E-02	9.43E-03
H-Tank Farm (HP-52 H-Area Tank Farm)	H-3, Co-60, Cs-137, U-234, U-235, U-238, Pu-238, Pu-239, Am-241, Cm-244, Sr-89,90	2.24E-03	1.50E-03
K Area (K Canal)	H-3, Co-60, Cs-137, Sr-89,90	1.22E-03	1.01E-03
L Area	H-3, Co-60, Cs-137, Sr-89,90	4.11E-04	3.10E-04
S Area (S-004)	H-3, Co-60, Cs-137, U-234, U-235, U-238, Pu-238, Pu-239, Sr-89,90	2.72E-03	8.76E-04
Tritium (HP-15 Tritium Facility Outfall)	H-3, Co-60, Cs-137, Sr-89,90	8.61E-03	6.32E-05

Appendix Table D-13 Summary of Radionuclides in Sediments

SRS collected annual sediment samples at 41 locations in 2021—10 Savannah River, 23 stream, and 8 stormwater basins—totaling 461 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, 150.2, 150.4, 151, and 157.2), 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 @ MO, McQB below Z Basin, Meyers Branch, PB @ Rd A, PB Swamp, SC-2A, SC-4, TB-5, U3R-3, U3R-4, U3R of Rd. 4, and U3R @ USFS Rd 2-1), and SRS Stormwater Basin locations (E-001, E-002, E-003, E-004, E-05, E-06, Pond 400, and Z-Basin). The control location for the river samples is RM 161.0. The control locations for the stream and stormwater basin sediment samples are TC-1 and U3R-1A.

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.

River Sediment Results

Nine River Locations Plus One Control
(Some locations only sampled for Cs-137, Co-60, gross alpha, and nonvolatile beta)

Analyte	Number > DL	Control RM 161.0 (pCi/g)	Location of Maximum Result	Maximum Result (pCi/g)
Americium-241	4 of 9	**3.53E-03**	RM-157.2	**4.07E-03**
Cesium-137	7 of 10	**7.38E-02**	SC RM	**1.59E+00**
Cobalt-60	1 of 10	6.48E-02	RM-134	**9.83E-02**
Curium-243/244	1 of 9	**1.05E-03**	All < MDA	All < MDA
Gross Alpha	10 of 10	**9.29E+00**	RM-157.2	**3.15E+01**
Neptunium-237	0 of 9	2.59E-03	All < MDA	All < MDA
Nonvolatile Beta	10 of 10	**2.04E+01**	RM-157.2	**3.20E+01**
Plutonium-238	0 of 9	2.03E-03	All < MDA	All < MDA
Plutonium-239/240	1 of 9	1.95E-03	RM-157.2	**1.60E-02**
Strontium-90	0 of 9	1.22E-01	All < MDA	All < MDA
Uranium-233/234	8 of 9	**1.47E+00**	RM-157.2	**2.14E+00**
Uranium-235	9 of 9	**8.27E-02**	RM-157.2	**1.07E-01**
Uranium-238	9 of 9	**1.43E+00**	RM-157.2	**2.34E+00**

Appendix Table D-13 Summary of Radionuclides in Sediments (continued)

Stream Sediment Results

21 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-1A (pCi/g)	Location of Maximum Result	Maximum Result (pCi/g)
Americium-241	12 of 16	1.23E-03	**2.94E-03**	FM-A-7A	**1.13E-01**
Cesium-137	17 of 23	5.08E-02	9.83E-02	DS of R-1	**7.90E+01**
Cobalt-60	0 of 23	3.97E-02	8.10E-02	All < MDA	All < MDA
Curium-243/244	7 of 16	9.94E-04	1.00E-03	FM-A-7A	**7.26E-02**
Gross Alpha	23 of 23	**5.54E+00**	**4.42E+01**	TB-5	**7.90E+01**
Neptunium-237	3 of 16	2.35E-03	1.48E-03	FM-2	**1.35E-02**
Nonvolatile Beta	23 of 23	**3.79E+00**	**2.86E+01**	DS of R-1	**1.11E+02**
Plutonium-238	9 of 16	2.16E-03	1.59E-03	FM-2	**2.76E-01**
Plutonium-239/240	13 of 16	**4.07E-03**	**6.98E-03**	FM-A-7A	**9.36E-02**
Strontium-90	4 of 16	1.26E-01	1.25E-01	SC-4	**5.07E-01**
Uranium-233/234	15 of 16	**5.70E-01**	**1.40E+00**	TB-5	**7.52E+00**
Uranium-235	15 of 16	**4.01E-02**	**6.30E-02**	TB-5	**3.82E-01**
Uranium-238	16 of 16	**5.32E-01**	**1.63E+00**	TB-5	**7.55E+00**

Stormwater Basin Sediment Results

Eight Basin Locations Plus Two Controls

Analyte	Number >DL	Control TC-1 (pCi/g)	Control U3R-1A (pCi/g)	Location of Maximum Result	Maximum Result (pCi/g)
Americium-241	4 of 10	1.23E-03	**2.94E-03**	E-003	**2.07E-02**
Cesium-137	3 of 10	5.08E-02	9.83E-02	Z Basin	**7.00E+02**
Cobalt-60	0 of 10	3.97E-02	8.10E-02	All < MDA	All < MDA
Curium-243/244	1 of 10	9.94E-04	1.00E-03	Pond 400	**9.86E-04**
Gross Alpha	10 of 10	**5.54E+00**	**4.42E+01**	E-004	**2.29E+01**
Neptunium-237	0 of 10	2.35E-03	1.48E-03	All < MDA	All < MDA
Nonvolatile Beta	10 of 10	**3.79E+00**	**2.86E+01**	Z Basin	**5.08E+02**
Plutonium-238	4 of 10	2.16E-03	1.59E-03	E-001	**1.48E-02**
Plutonium-239/240	7 of 10	**4.07E-03**	**6.98E-03**	Pond 400	**3.11E-02**
Strontium-90	1 of 10	1.26E-01	1.25E-01	E-003	**1.26E+00**
Uranium-233/234	10 of 10	**5.70E-01**	**1.40E+00**	E-004	**2.05E+00**
Uranium-235	9 of 10	**4.01E-02**	**6.30E-02**	E-004	**1.28E-01**
Uranium-238	10 of 10	**5.32E-01**	**1.63E+00**	E-004	**2.07E+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; therefore, they were not reported in the table below. Samples are collected at one onsite (782-3A) location quarterly for tritium, Co-60, Cs-137, gross beta and gross alpha analyses, and collected annually for Sr-90 and actinides analyses. Unfortunately, SRS was unable to collect the third quarter sample for 2021 for this location. 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; therefore, they were not reported in the table below. For the onsite annual samples, all results for tritium, Co-60, Cs-137, Sr-89,90, U-235, Pu-238, Pu-239, and Cm-244 were below detection limits; therefore, they were not reported in this table.

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	12	2.35E+02	**1.30E+02**	**6.62E+02**
North Augusta Public Water Works	12	1	5.56E+01	-2.06E+01	**1.41E+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	1.74E+00	**1.25E+00**	**2.17E+00**
North Augusta Public Water Works	12	12	1.71E+00	**1.34E+00**	**2.16E+00**

Appendix Table D-14 Summary of Radionuclides in Drinking Water (continued)

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	3	3	1.50E+00	**1.30E+00**	**1.66E+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	3	3	9.61E-01	**7.70E-01**	**1.18E+00**

Onsite Location Summary—Annual Samples

		U-234	**U-238**	**Am-241**
Location	**Number of Samples**	**Concentration (pCi/L)**	**Concentration (pCi/L)**	**Concentration (pCi/L)**
617-8G	1	**8.78E-03**	**8.78E-03**	**1.66E-02**
704-16G	1	6.11E-04	5.51E-03	**1.16E-02**
709-1G	1	5.19E-03	-3.78E-06	7.46E-03
737-G	1	5.57E-04	5.11E-03	**1.35E-02**
782-3A (annual)	1	**1.27E-02**	**2.66E-02**	**1.24E-02**
905-112G Well	1	**2.38E-02**	**3.11E-02**	6.73E-03
905-113G Well	1	**2.55E-02**	**2.76E-02**	**1.04E-02**
905-125B	1	**1.16E-02**	**1.21E-02**	6.73E-03
905-67B	1	**2.76E-02**	**6.27E-02**	5.84E-03

Appendix Table D-14 Summary of Radionuclides in Drinking Water (continued)

Onsite Location Summary—Annual Samples (continued)

		Gross Beta	Gross Alpha
Location	**Number of Samples**	**Concentration (pCi/L)**	**Concentration (pCi/L)**
617-8G	1	**9.68E-01**	3.95E-02
704-16G	1	**1.29E+00**	**1.17E+00**
709-1G	1	**1.34E+00**	3.49E-01
737-G	1	**8.00E-01**	**5.68E-01**
782-3A (annual)	1	**1.66E+00**	**9.32E-01**
905-112G Well	1	**9.89E-01**	**7.84E-01**
905-113G Well	1	**8.92E-01**	**5.43E-01**
905-125B	1	**8.38E-01**	**3.11E-01**
905-67B	1	3.57E-01	3.00E-01

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; therefore, they were 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, except flathead catfish.

Cs-137 (Edible)												
	Bass			Catfish			Flathead			Panfish		
Location	**Mean (pCi/kg)**	**Minimum (pCi/kg)**	**Maximum (pCi/kg)**	**Mean (pCi/kg)**	**Minimum (pCi/kg)**	**Maximum (pCi/kg)**	**Mean (pCi/kg)**	**Minimum (pCi/kg)**	**Maximum (pCi/kg)**	**Mean (pCi/kg)**	**Minimum (pCi/kg)**	**Maximum (pCi/kg)**
Augusta L&D	0.00E+00	1.15E+01	1.59E+01	3.59E+01	**2.46E+01**	**4.22E+01**	**5.32E+01**	**3.22E+01**	**7.43E+01**	0.00E+00	-8.57E+00	1.32E+01
Four Mile Creek River Mouth	**3.84E+01**	**3.03E+01**	**4.84E+01**	**6.41E+01**	**3.68E+01**	**7.97E+01**	**4.58E+01**	**2.25E+01**	**9.89E+01**	**5.09E+01**	**2.42E+01**	**7.41E+01**
Hwy 301 Bridge Area	**2.23E+01**	**1.74E+01**	**3.19E+01**	**2.46E+01**	**1.85E+01**	**3.30E+01**	**2.78E+01**	**2.61E+01**	**3.00E+01**	**2.17E+01**	**2.05E+01**	**2.29E+01**
Lower Three Runs Creek River Mouth	**3.92E+01**	**3.16E+01**	**4.46E+01**	**1.04E+02**	**3.24E+01**	**2.23E+02**	**1.60E+02**	**2.32E+01**	**4.00E+02**	2.79E+01	1.55E+01	**4.22E+01**
Steel Creek River Mouth	**3.61E+02**	**2.02E+02**	**5.03E+02**	**1.06E+02**	**8.38E+01**	**1.25E+02**	**3.35E+01**	**2.14E+01**	**6.24E+01**	**1.59E+02**	**8.24E+01**	**2.68E+02**
Upper Three Runs Creek River Mouth	**4.43E+01**	**1.98E+01**	**6.27E+01**	1.33E+01	5.95E+00	**2.10E+01**	**3.25E+01**	**1.52E+01**	**4.86E+01**	**5.56E+01**	**3.43E+01**	**8.46E+01**

Appendix Table D-15 Summary of Radionuclides in Freshwater Fish (continued)

	Sr-89,90 (Edible)											
	Bass			Catfish			Flathead			Panfish		
Location	**Mean (pCi/kg)**	**Minimum (pCi/kg)**	**Maximum (pCi/kg)**	**Mean (pCi/kg)**	**Minimum (pCi/kg)**	**Maximum (pCi/kg)**	**Mean (pCi/kg)**	**Minimum (pCi/kg)**	**Maximum (pCi/kg)**	**Mean (pCi/kg)**	**Minimum (pCi/kg)**	**Maximum (pCi/kg)**
Augusta L&D	2.87E+00	4.41E-01	**6.78E+00**	0.00E+00	8.32E-01	2.44E+00	0.00E+00	1.11E+00	1.39E+00	0.00E+00	-1.46E-01	2.02E+00
Four Mile Creek River Mouth	2.09E+00	1.28E+00	**2.70E+00**	2.39E+00	1.21E+00	**4.30E+00**	**2.85E+00**	**2.38E+00**	**3.27E+00**	**3.06E+00**	**2.61E+00**	**3.84E+00**
Hwy 301 Bridge Area	0.00E+00	9.78E-01	2.56E+00	3.98E+00	1.04E-01	**6.05E+00**	0.00E+00	2.01E-01	2.89E+00	0.00E+00	1.15E+00	1.58E+00
Lower Three Runs Creek River Mouth	4.60E+00	2.92E+00	**6.16E+00**	1.48E+00	7.57E-01	**2.64E+00**	0.00E+00	1.35E+00	1.99E+00	0.00E+00	1.47E+00	4.62E+00
Steel Creek River Mouth	0.00E+00	1.49E+00	2.29E+00	0.00E+00	1.66E-01	2.37E+00	0.00E+00	-7.76E-01	2.10E+00	4.93E+00	3.51E+00	**5.68E+00**
Upper Three Runs Creek River Mouth	4.34E+00	3.84E+00	**5.32E+00**	0.00E+00	1.85E+00	3.95E+00	0.00E+00	-1.41E-01	3.38E+00	0.00E+00	7.59E-01	3.41E+00

	Sr-89,90 (Nonedible)											
	Bass			Catfish			Flathead			Panfish		
Location	**Mean (pCi/kg)**	**Minimum (pCi/kg)**	**Maximum (pCi/kg)**	**Mean (pCi/kg)**	**Minimum (pCi/kg)**	**Maximum (pCi/kg)**	**Mean (pCi/kg)**	**Minimum (pCi/kg)**	**Maximum (pCi/kg)**	**Mean (pCi/kg)**	**Minimum (pCi/kg)**	**Maximum (pCi/kg)**
Augusta L&D	4.91E+02	2.45E+02	**7.27E+02**	**8.07E+02**	**7.22E+02**	**9.46E+02**	**4.74E+02**	**3.95E+02**	**5.54E+02**	**6.66E+02**	**4.62E+02**	**8.49E+02**
Four Mile Creek River Mouth	**1.21E+02**	**7.11E+01**	**1.99E+02**	**1.42E+02**	**1.11E+02**	**1.91E+02**	1.03E+02	7.22E+01	**1.14E+02**	**3.14E+02**	**1.31E+02**	**4.35E+02**
Hwy 301 Bridge Area	**5.64E+02**	**4.41E+02**	**6.97E+02**	**5.75E+02**	**5.03E+02**	**6.49E+02**	**4.59E+02**	**4.00E+02**	**6.05E+02**	**6.84E+02**	**5.57E+02**	**8.14E+02**
Lower Three Runs Creek River Mouth	5.05E+02	3.84E+02	**5.81E+02**	**5.80E+02**	**4.70E+02**	**7.51E+02**	5.14E+02	3.30E+02	**7.51E+02**	**5.84E+02**	**3.35E+02**	**8.05E+02**
Steel Creek River Mouth	**6.95E+02**	**5.35E+02**	**7.89E+02**	**7.16E+02**	**5.22E+02**	**8.27E+02**	6.07E+02	3.14E-02	**8.81E+02**	6.14E+02	3.76E+02	**8.05E+02**
Upper Three Runs Creek River Mouth	5.51E+02	1.88E+02	**1.09E+03**	**5.26E+02**	**4.08E+02**	**6.78E+02**	2.79E+02	8.76E+01	**3.62E+02**	**6.28E+02**	**5.62E+02**	**7.49E+02**

Appendix Table D-15 Summary of Radionuclides in Freshwater Fish (continued)

Tc-99 (Edible)

Location	Bass			Catfish			Flathead			Panfish		
	Mean (pCi/kg)	Minimum (pCi/kg)	Maximum (pCi/kg)	Mean (pCi/kg)	Minimum (pCi/kg)	Maximum (pCi/kg)	Mean (pCi/kg)	Minimum (pCi/kg)	Maximum (pCi/kg)	Mean (pCi/kg)	Minimum (pCi/kg)	Maximum (pCi/kg)
Augusta L&D	0.00E+00	-3.92E+01	4.03E+00	0.00E+00	-2.76E+01	-9.19E+00	0.00E+00	-2.64E+01	**-5.51E+00**	0.00E+00	-1.47E+01	2.49E+01
Four Mile Creek River Mouth	0.00E+00	-7.30E+00	5.24E+01	0.00E+00	1.02E+01	3.57E+01	0.00E+00	-7.30E-01	9.14E+01	0.00E+00	2.19E+01	3.43E+01
Hwy 301 Bridge Area	0.00E+00	-3.08E+01	-2.46E+00	0.00E+00	-4.43E+01	-2.70E+01	0.00E+00	-3.49E+01	-2.50E+01	0.00E+00	-4.03E+01	-2.67E+01
Lower Three Runs Creek River Mouth	0.00E+00	-2.15E+01	9.76E+00	0.00E+00	1.42E-04	2.30E+01	0.00E+00	-3.89E+00	2.23E+01	0.00E+00	-7.03E+00	9.73E+00
Steel Creek River Mouth	0.00E+00	6.43E+00	2.48E+01	0.00E+00	-2.03E+00	4.19E+01	0.00E+00	4.05E+00	4.49E+01	0.00E+00	1.87E+01	4.97E+01
Upper Three Runs Creek River Mouth	0.00E+00	2.05E+00	7.30E+01	0.00E+00	-8.27E+00	7.62E+01	6.48E+01	-1.86E+01	1.09E+02	0.00E+00	-3.38E+00	3.65E+01

Gross Beta (Edible)

Location	Bass			Catfish			Flathead			Panfish		
	Mean (pCi/kg)	Minimum (pCi/kg)	Maximum (pCi/kg)	Mean (pCi/kg)	Minimum (pCi/kg)	Maximum (pCi/kg)	Mean (pCi/kg)	Minimum (pCi/kg)	Maximum (pCi/kg)	Mean (pCi/kg)	Minimum (pCi/kg)	Maximum (pCi/kg)
Augusta L&D	**2.64E+03**	**2.40E+03**	**2.84E+03**	**2.83E+03**	**2.12E+03**	**3.38E+03**	**2.76E+03**	**2.64E+03**	**2.89E+03**	**1.94E+03**	**1.39E+03**	**2.38E+03**
Four Mile Creek River Mouth	**1.82E+03**	**1.51E+03**	**2.18E+03**	**2.35E+03**	**2.06E+03**	**2.52E+03**	**1.97E+03**	**1.76E+03**	**2.22E+03**	**1.61E+03**	**1.41E+03**	**1.74E+03**
Hwy 301 Bridge Area	**1.19E+03**	**1.01E+03**	**1.30E+03**	**1.70E+03**	**1.29E+03**	**2.09E+03**	**1.90E+03**	**1.73E+03**	**2.12E+03**	**1.44E+03**	**1.28E+03**	**1.59E+03**
Lower Three Runs Creek River Mouth	**1.51E+03**	**1.21E+03**	**1.75E+03**	**1.65E+03**	**1.56E+03**	**1.74E+03**	**1.79E+03**	**1.43E+03**	**2.15E+03**	**8.10E+02**	**5.54E+02**	**1.15E+03**
Steel Creek River Mouth	**2.83E+03**	**2.17E+03**	**3.27E+03**	**3.03E+03**	**2.76E+03**	**3.43E+03**	**2.36E+03**	**1.95E+03**	**2.73E+03**	**2.06E+03**	**1.49E+03**	**2.84E+03**
Upper Three Runs Creek River Mouth	**2.15E+03**	**1.78E+03**	**2.33E+03**	**1.93E+03**	**1.75E+03**	**2.18E+03**	**2.12E+03**	**1.95E+03**	**2.39E+03**	**1.77E+03**	**1.72E+03**	**1.84E+03**

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, gross alpha, I-129, Sr-89,90 (in flesh), and Tc-99 were below method detection limits.

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

	Marine Mullet				
Analyte	**Number of Samples**	**Number of Results > Detection Limit**	**Mean (pCi/kg)**	**Minimum (pCi/kg)**	**Maximum (pCi/kg)**
Cs-137	3	1	0.00E+00	--2.25E+00	6.03E+00
Gross Beta	3	3	**1.60E+03**	**1.44E+03**	**1.82E+03**
Sr-89,90 (Nonedible)	3	1	2.41E+02	1.37E+02	**4.41E+02**

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 Cs-137, Co-60, I-129, Sr-89,90, and Tc-99 results were not detected; therefore, they were not reported in this table.

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

The specie of shellfish collected in 2021 was crab.

Nuclide	Number of Samples	Number of Results > Detection Limit	Mean Concentration (pCi/kg)	Minimum Concentration (pCi/kg)	Maximum Concentration (pCi/kg)
Gross Alpha	1	0	1.88E+02	1.88E+02	1.88E+02
Gross Beta	1	2	**8.51E+02**	**8.51E+02**	**8.51E+02**

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; therefore, they 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)
Hog Flesh	Cs-137	26	26	1.77E+00	**1.86E-01**	**4.60E+00**
Hog Flesh	Sr-89,90	26	3	2.23E-03	-6.82E-04	**8.47E-03**