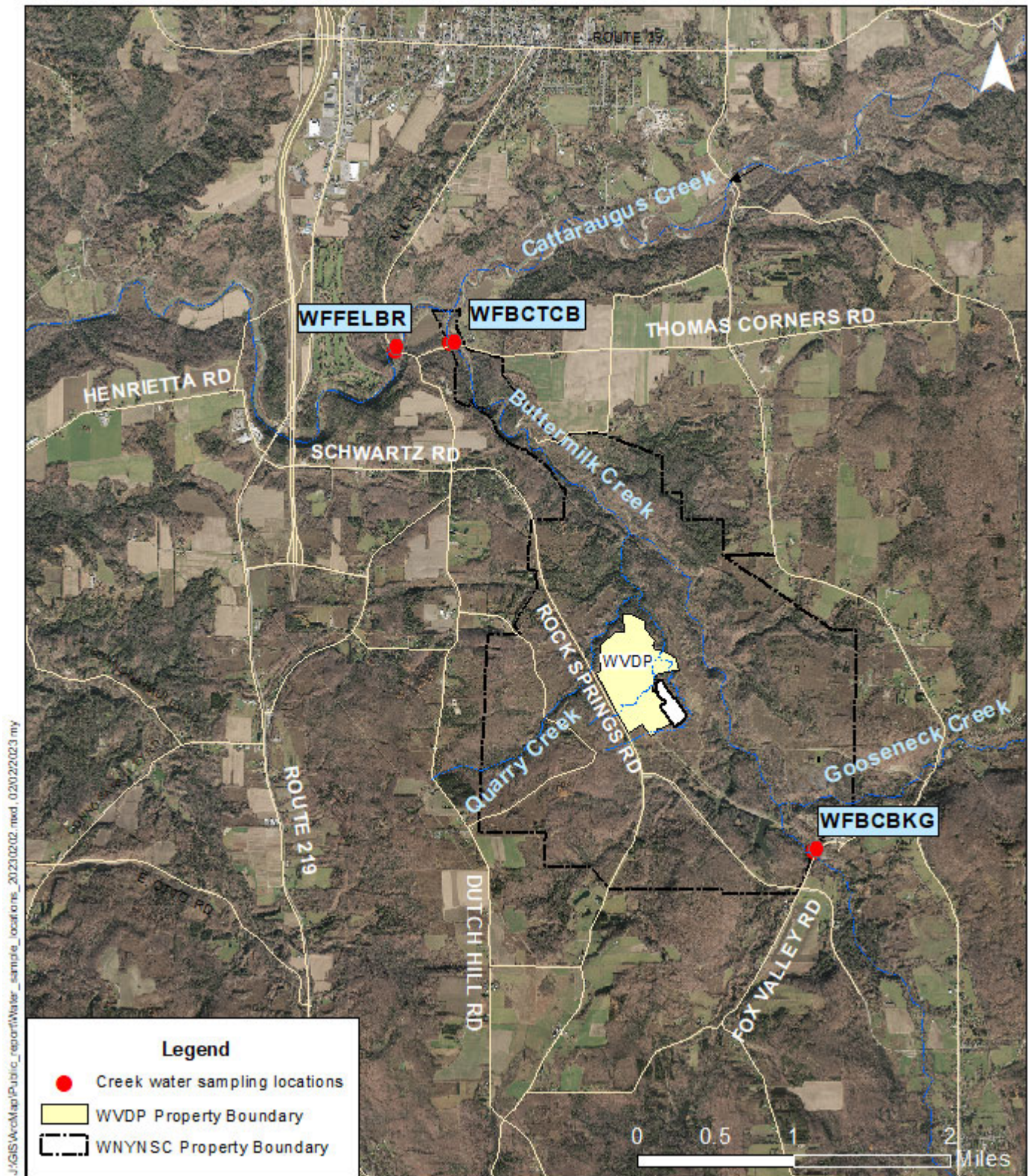


Off-Site Surface Water Concentrations Third Quarter of 2022 (September 2022)

Notes:

- 1) Off-site surface water is monitored at three stream locations (attached figure). These stream samples are collected with a timed-continuous water sampling system. The members of the public do not have access to the WVDP site or the on-site water. The off-site locations included in this data release are:
 - WFBCBKG– Buttermilk Creek near Fox Valley Road, *upstream* of WVDP.
 - Not impacted by WVDP activities and used as a background sample.
 - Collected biweekly and composited into semiannual samples (June and December).
 - WFBCTCB–Buttermilk Creek at Thomas Corners Road, *downstream* of the WVDP and *upstream* of the confluence with Cattaraugus Creek.
 - Collected biweekly and composited into semiannual samples (June and December).
 - WFFELBR–Cattaraugus Creek at Felton Bridge, *downstream* of the confluence with Buttermilk Creek).
 - The first point of public access (e.g., fishing) to creek water that is potentially impacted by the site.
 - Cattaraugus Creek water is not a source of public drinking water.
 - Samples collected biweekly and composited into monthly samples.
- 2) Radiological Sampling: Concentrations of Gross Alpha and Beta, tritium (H-3), strontium-90 (Sr-90), cesium-137 (Cs-137), and pH are measured for off-site surface water. Historically, Sr-90 and Cs-137 contribute the majority of radiologic dose from surface water discharged or flowing from the WVDP (Sr-90 contributed 84% and Cs-137 contributed 12% in 2021). This data release focuses on those two significant radionuclides.
- 3) Derived Concentration Standards (DCS): The sampling results from these three locations are compared to the DOE's guidelines for ingested water, which are presented in DOE-STD-1196-2021, "Derived Concentration Technical Standard." DCSs are used in the following graphs to demonstrate that each creek water sample result is significantly below the DCS standards. Note the trend graphs include up to five years of data for comparative purposes.
- 4) Negative results in the data tables represent samples with zero radioactivity present, or where the instrument background slightly exceeds the instrument radioactivity count rate obtained for the sample.

Off-Site Surface Water Monitoring Locations

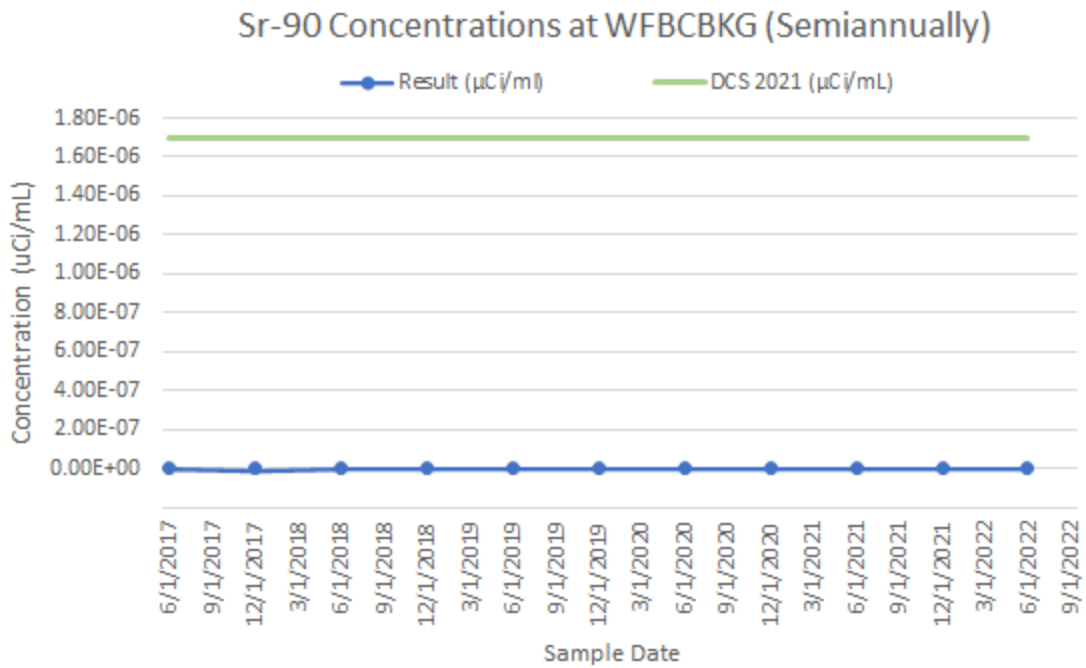


J:\GIS\ArcMap\Public_reports\Water_sample_locations_2023\0202_ned_02\022023.mxd

1. WFBCBKG

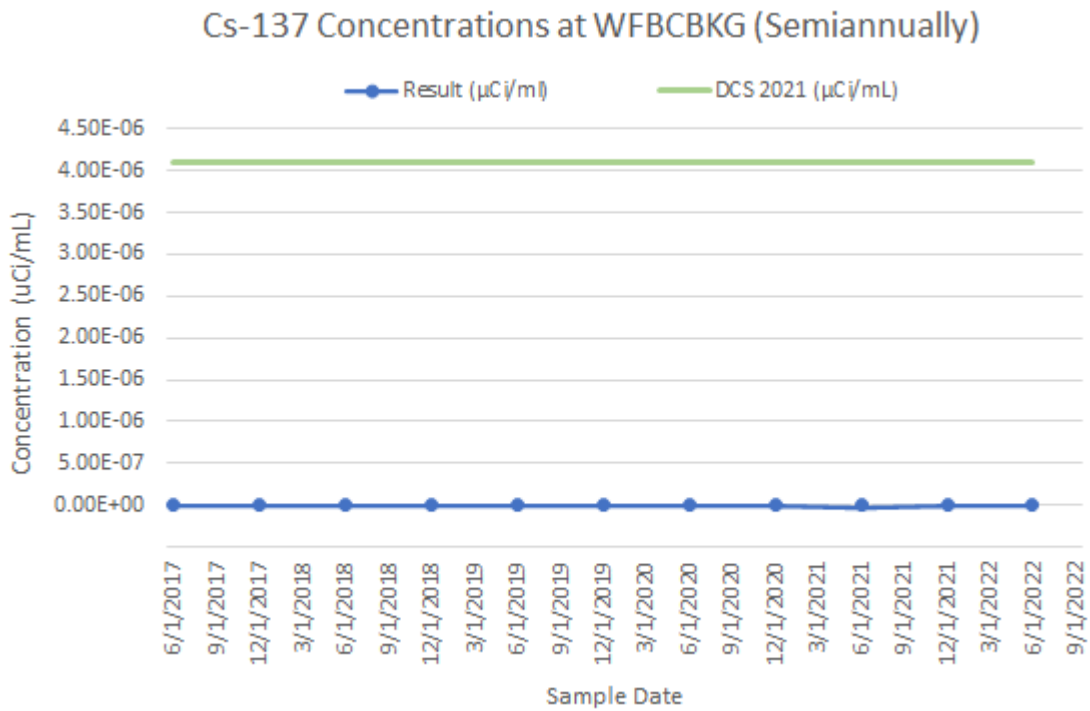
1.1 Strontium-90 (Sr-90)

Location	Sample Date	Result (μCi/mL)	Uncertainty (μCi/mL)	DCS 2021 (μCi/mL)	Concentration (%) of DCS
WFBCBKG	6/20/2017	3.88E-10	9.42E-10	1.70E-06	0.02%
WFBCBKG	12/19/2017	-5.16E-10	5.37E-10	1.70E-06	-0.03%
WFBCBKG	6/19/2018	2.96E-10	1.06E-09	1.70E-06	0.02%
WFBCBKG	12/18/2018	-1.53E-10	1.02E-09	1.70E-06	-0.01%
WFBCBKG	6/18/2019	3.92E-10	6.52E-10	1.70E-06	0.02%
WFBCBKG	12/17/2019	4.53E-10	8.70E-10	1.70E-06	0.03%
WFBCBKG	6/16/2020	-3.18E-11	9.91E-10	1.70E-06	0.00%
WFBCBKG	12/15/2020	7.49E-10	1.12E-09	1.70E-06	0.04%
WFBCBKG	6/15/2021	2.37E-10	4.79E-10	1.70E-06	0.01%
WFBCBKG	12/28/2021	3.03E-10	1.08E-09	1.70E-06	0.02%
WFBCBKG	6/28/2022	-1.16E-10	1.00E-09	1.70E-06	-0.01%



1-2. Cesium-137 (Cs-137)

Location	Sample Date	Result (μCi/mL)	Uncertainty (μCi/mL)	DCS 2021 (μCi/mL)	Concentration (%) of DCS
WFBCBKG	6/20/2017	2.00E-11	3.03E-09	4.10E-06	0.00%
WFBCBKG	12/19/2017	-1.72E-09	2.32E-09	4.10E-06	-0.04%
WFBCBKG	6/19/2018	1.30E-09	2.58E-09	4.10E-06	0.03%
WFBCBKG	12/18/2018	0.00E+00	1.68E-09	4.10E-06	0.00%
WFBCBKG	6/18/2019	-7.96E-10	2.72E-09	4.10E-06	-0.02%
WFBCBKG	12/17/2019	1.64E-09	3.65E-09	4.10E-06	0.04%
WFBCBKG	6/16/2020	2.52E-10	2.54E-09	4.10E-06	0.01%
WFBCBKG	12/15/2020	-3.69E-10	1.92E-09	4.10E-06	-0.01%
WFBCBKG	6/15/2021	-1.99E-09	2.11E-09	4.10E-06	-0.05%
WFBCBKG	12/28/2021	6.83E-10	2.27E-09	4.10E-06	0.02%
WFBCBKG	6/28/2022	-1.74E-09	2.91E-09	4.10E-06	-0.04%

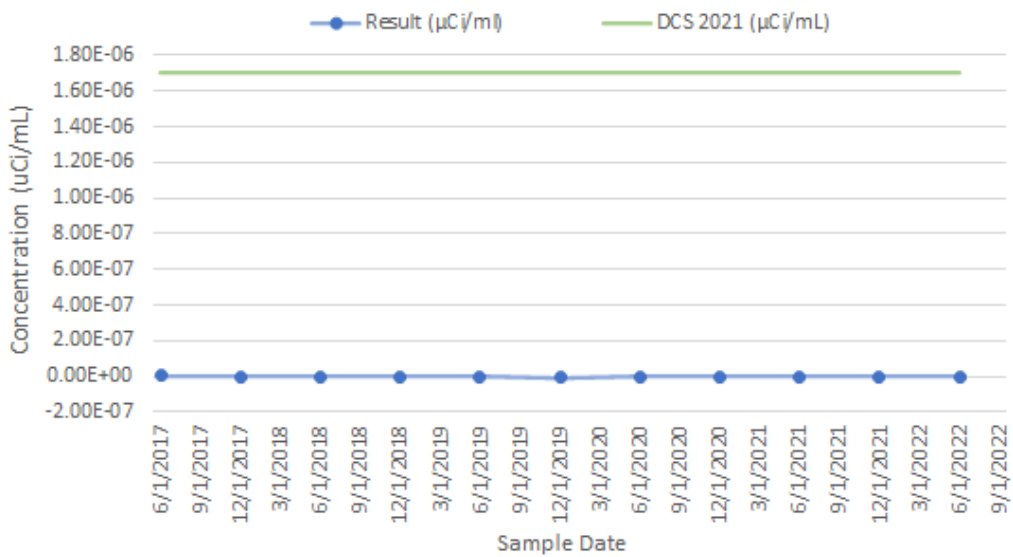


2. WFBCTCB

2.1 Strontium-90 (Sr-90)

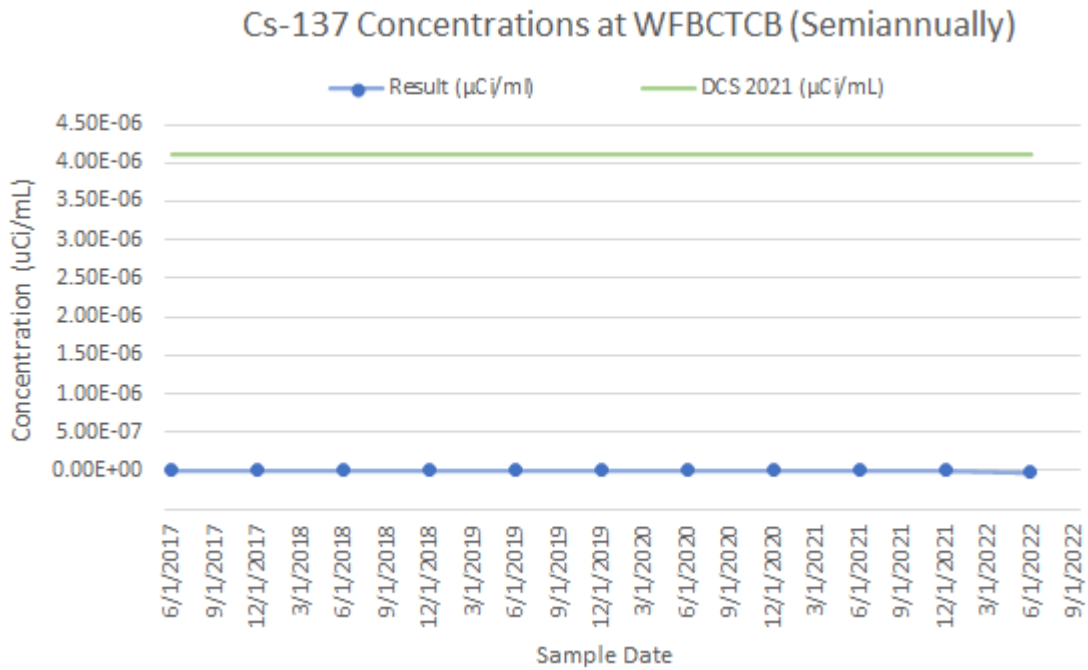
Location	Sample Date	Result (μCi/mL)	Uncertainty (μCi/mL)	DCS 2021 (μCi/mL)	Concentration (%) of DCS
WFBCTCB	6/20/2017	2.37E-09	1.02E-09	1.70E-06	0.14%
WFBCTCB	12/19/2017	1.46E-09	9.44E-10	1.70E-06	0.09%
WFBCTCB	6/19/2018	1.33E-09	1.14E-09	1.70E-06	0.08%
WFBCTCB	12/18/2018	1.10E-09	1.08E-09	1.70E-06	0.06%
WFBCTCB	6/18/2019	1.34E-09	1.18E-09	1.70E-06	0.08%
WFBCTCB	12/17/2019	1.45E-10	8.83E-10	1.70E-06	0.01%
WFBCTCB	6/16/2020	4.75E-10	6.35E-10	1.70E-06	0.03%
WFBCTCB	12/15/2020	1.42E-09	1.23E-09	1.70E-06	0.08%
WFBCTCB	6/15/2021	1.35E-09	8.13E-10	1.70E-06	0.08%
WFBCTCB	12/28/2021	1.30E-09	1.16E-09	1.70E-06	0.08%
WFBCTCB	6/28/2022	1.62E-09	1.21E-09	1.70E-06	0.10%

Sr-90 Concentrations at WFBCTCB (Semiannually)



2-2. Cesium-137 (Cs-137)

Location	Sample Date	Result (μCi/mL)	Uncertainty (μCi/mL)	DCS 2021 (μCi/mL)	Concentration (%) of DCS
WFBCTCB	6/20/2017	2.28E-09	2.93E-09	4.10E-06	0.06%
WFBCTCB	12/19/2017	7.95E-10	1.97E-09	4.10E-06	0.02%
WFBCTCB	6/19/2018	2.47E-09	2.72E-09	4.10E-06	0.06%
WFBCTCB	12/18/2018	-1.41E-09	2.09E-09	4.10E-06	-0.03%
WFBCTCB	6/18/2019	8.33E-10	2.38E-09	4.10E-06	0.02%
WFBCTCB	12/17/2019	-2.46E-10	2.67E-09	4.10E-06	-0.01%
WFBCTCB	6/16/2020	-1.20E-09	2.69E-09	4.10E-06	-0.03%
WFBCTCB	12/15/2020	6.05E-10	2.66E-09	4.10E-06	0.01%
WFBCTCB	6/15/2021	9.17E-10	2.44E-09	4.10E-06	0.02%
WFBCTCB	12/28/2021	9.03E-10	2.10E-09	4.10E-06	0.02%
WFBCTCB	6/28/2022	-4.73E-09	5.11E-09	4.10E-06	-0.12%

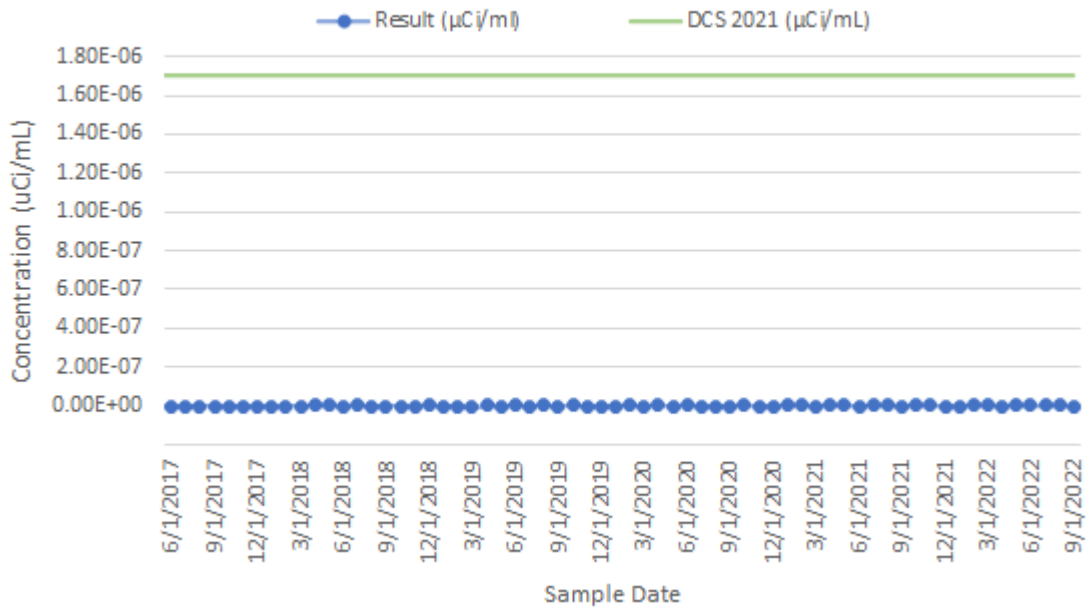


3. WFFELBR**3.1 Strontium-90 (Sr-90)**

Location	Sample Date	Result ($\mu\text{Ci/mL}$)	Uncertainty ($\mu\text{Ci/mL}$)	DCS 2021 ($\mu\text{Ci/mL}$)	Concentration (%) of DCS
WFFELBR	1/17/2017	-3.79E-10	7.39E-10	1.70E-06	-0.02%
WFFELBR	2/14/2017	1.92E-10	8.73E-10	1.70E-06	0.01%
WFFELBR	3/28/2017	3.72E-10	8.57E-10	1.70E-06	0.02%
WFFELBR	4/25/2017	3.78E-10	6.42E-10	1.70E-06	0.02%
WFFELBR	5/23/2017	7.41E-10	9.83E-10	1.70E-06	0.04%
WFFELBR	6/20/2017	3.85E-10	8.74E-10	1.70E-06	0.02%
WFFELBR	7/18/2017	1.97E-10	8.52E-10	1.70E-06	0.01%
WFFELBR	8/15/2017	-9.18E-11	6.43E-10	1.70E-06	-0.01%
WFFELBR	9/26/2017	3.34E-10	8.76E-10	1.70E-06	0.02%
WFFELBR	10/24/2017	7.34E-11	7.70E-10	1.70E-06	0.00%
WFFELBR	11/21/2017	-6.73E-10	4.83E-10	1.70E-06	-0.04%
WFFELBR	12/19/2017	1.13E-12	7.14E-10	1.70E-06	0.00%
WFFELBR	1/16/2018	-2.28E-10	5.64E-10	1.70E-06	-0.01%
WFFELBR	2/13/2018	1.33E-10	6.81E-10	1.70E-06	0.01%
WFFELBR	3/27/2018	-4.09E-10	1.03E-09	1.70E-06	-0.02%
WFFELBR	4/24/2018	4.23E-10	6.36E-10	1.70E-06	0.02%
WFFELBR	5/22/2018	1.38E-09	1.14E-09	1.70E-06	0.08%
WFFELBR	6/19/2018	2.60E-10	1.04E-09	1.70E-06	0.02%
WFFELBR	7/17/2018	4.73E-10	1.03E-09	1.70E-06	0.03%
WFFELBR	8/28/2018	-1.07E-10	6.84E-10	1.70E-06	-0.01%
WFFELBR	9/25/2018	-2.45E-10	4.85E-10	1.70E-06	-0.01%
WFFELBR	10/23/2018	-1.07E-10	1.03E-09	1.70E-06	-0.01%
WFFELBR	11/20/2018	-7.81E-10	7.47E-10	1.70E-06	-0.05%
WFFELBR	12/18/2018	7.74E-10	8.98E-10	1.70E-06	0.05%
WFFELBR	1/15/2019	-6.15E-10	5.14E-10	1.70E-06	-0.04%
WFFELBR	2/12/2019	-1.49E-10	8.89E-10	1.70E-06	-0.01%
WFFELBR	3/26/2019	-1.04E-09	8.95E-10	1.70E-06	-0.06%
WFFELBR	4/23/2019	5.40E-10	5.81E-10	1.70E-06	0.03%
WFFELBR	5/21/2019	-5.30E-11	6.29E-10	1.70E-06	0.00%
WFFELBR	6/18/2019	6.00E-10	7.34E-10	1.70E-06	0.04%
WFFELBR	7/16/2019	-5.33E-10	7.42E-10	1.70E-06	-0.03%
WFFELBR	8/27/2019	9.51E-10	8.82E-10	1.70E-06	0.06%
WFFELBR	9/24/2019	3.01E-12	1.04E-09	1.70E-06	0.00%
WFFELBR	10/22/2019	4.16E-10	1.03E-09	1.70E-06	0.02%
WFFELBR	11/19/2019	6.80E-11	8.85E-10	1.70E-06	0.00%
WFFELBR	12/17/2019	3.56E-10	7.86E-10	1.70E-06	0.02%
WFFELBR	1/28/2020	-3.11E-10	6.79E-10	1.70E-06	-0.02%
WFFELBR	2/25/2020	1.51E-09	1.12E-09	1.70E-06	0.09%
WFFELBR	3/24/2020	7.04E-12	7.24E-10	1.70E-06	0.00%
WFFELBR	4/21/2020	6.64E-10	8.83E-10	1.70E-06	0.04%
WFFELBR	5/19/2020	-7.65E-10	8.67E-10	1.70E-06	-0.05%
WFFELBR	6/16/2020	4.51E-10	9.00E-10	1.70E-06	0.03%
WFFELBR	7/28/2020	1.18E-10	9.70E-10	1.70E-06	0.01%
WFFELBR	8/25/2020	-8.61E-11	4.91E-10	1.70E-06	-0.01%
WFFELBR	9/22/2020	-1.01E-09	7.05E-10	1.70E-06	-0.06%

WFFELBR	10/20/2020	7.50E-10	1.14E-09	1.70E-06	0.04%
WFFELBR	11/17/2020	-1.86E-10	1.01E-09	1.70E-06	-0.01%
WFFELBR	12/15/2020	3.63E-10	1.08E-09	1.70E-06	0.02%
WFFELBR	1/26/2021	5.52E-10	8.66E-10	1.70E-06	0.03%
WFFELBR	2/23/2021	9.10E-10	1.10E-09	1.70E-06	0.05%
WFFELBR	3/23/2021	3.84E-10	1.11E-09	1.70E-06	0.02%
WFFELBR	4/20/2021	8.06E-10	1.01E-09	1.70E-06	0.05%
WFFELBR	5/18/2021	6.36E-10	1.12E-09	1.70E-06	0.04%
WFFELBR	6/15/2021	3.93E-10	9.22E-10	1.70E-06	0.02%
WFFELBR	7/27/2021	1.04E-09	1.02E-09	1.70E-06	0.06%
WFFELBR	8/24/2021	5.17E-10	1.08E-09	1.70E-06	0.03%
WFFELBR	9/21/2021	1.98E-10	9.47E-10	1.70E-06	0.01%
WFFELBR	10/19/2021	9.93E-10	8.32E-10	1.70E-06	0.06%
WFFELBR	11/16/2021	1.28E-09	1.12E-09	1.70E-06	0.08%
WFFELBR	12/28/2021	3.90E-10	1.05E-09	1.70E-06	0.02%
WFFELBR	1/25/2022	-4.17E-10	6.89E-10	1.70E-06	-0.02%
WFFELBR	2/22/2022	7.88E-10	1.15E-09	1.70E-06	0.05%
WFFELBR	3/22/2022	9.01E-10	1.15E-09	1.70E-06	0.05%
WFFELBR	4/19/2022	4.01E-11	1.10E-09	1.70E-06	0.00%
WFFELBR	5/17/2022	4.43E-10	8.46E-10	1.70E-06	0.03%
WFFELBR	6/28/2022	4.05E-10	1.06E-09	1.70E-06	0.02%
WFFELBR	7/26/2022	9.26E-10	7.02E-10	1.70E-06	0.05%
WFFELBR	8/23/2022	5.47E-10	7.55E-10	1.70E-06	0.03%
WFFELBR	9/20/2022	-3.85E-10	9.92E-10	1.70E-06	-0.02%

Sr-90 Concentrations at WFFELBR (Monthly)



3.2 Cesium-137 (Cs-137)

Location	Sample Date	Result ($\mu\text{Ci/mL}$)	Uncertainty ($\mu\text{Ci/mL}$)	DCS 2021 ($\mu\text{Ci/mL}$)	Concentration (%) of DCS
WFFELBR	1/17/2017	-1.52E-09	2.76E-09	4.10E-06	-0.04%
WFFELBR	2/14/2017	-1.49E-09	3.37E-09	4.10E-06	-0.04%
WFFELBR	3/28/2017	-4.70E-10	2.36E-09	4.10E-06	-0.01%
WFFELBR	4/25/2017	2.93E-10	1.64E-09	4.10E-06	0.01%
WFFELBR	5/23/2017	-4.87E-11	2.07E-09	4.10E-06	0.00%
WFFELBR	6/20/2017	-2.24E-12	3.01E-09	4.10E-06	0.00%
WFFELBR	7/18/2017	5.00E-10	2.43E-09	4.10E-06	0.01%
WFFELBR	8/15/2017	-4.77E-10	2.88E-09	4.10E-06	-0.01%
WFFELBR	9/26/2017	-8.18E-10	2.50E-09	4.10E-06	-0.02%
WFFELBR	10/24/2017	-9.28E-12	2.55E-09	4.10E-06	0.00%
WFFELBR	11/21/2017	1.84E-09	2.15E-09	4.10E-06	0.04%
WFFELBR	12/19/2017	9.18E-10	1.66E-09	4.10E-06	0.02%
WFFELBR	1/16/2018	8.40E-11	2.18E-09	4.10E-06	0.00%
WFFELBR	2/13/2018	3.80E-11	1.91E-09	4.10E-06	0.00%
WFFELBR	3/27/2018	5.80E-11	6.01E-09	4.10E-06	0.00%
WFFELBR	4/24/2018	3.30E-09	1.98E-09	4.10E-06	0.08%
WFFELBR	5/22/2018	1.09E-09	2.56E-09	4.10E-06	0.03%
WFFELBR	6/19/2018	4.60E-10	2.08E-09	4.10E-06	0.01%
WFFELBR	7/17/2018	8.15E-10	2.53E-09	4.10E-06	0.02%
WFFELBR	8/28/2018	1.01E-09	1.77E-09	4.10E-06	0.02%
WFFELBR	9/25/2018	-3.33E-10	2.05E-09	4.10E-06	-0.01%
WFFELBR	10/23/2018	6.68E-10	2.13E-09	4.10E-06	0.02%
WFFELBR	11/20/2018	2.10E-10	2.14E-09	4.10E-06	0.01%
WFFELBR	12/18/2018	1.84E-09	2.93E-09	4.10E-06	0.04%
WFFELBR	1/15/2019	8.92E-10	2.04E-09	4.10E-06	0.02%
WFFELBR	2/12/2019	-1.30E-09	2.50E-09	4.10E-06	-0.03%
WFFELBR	3/26/2019	2.60E-09	2.51E-09	4.10E-06	0.06%
WFFELBR	4/23/2019	2.61E-09	3.73E-09	4.10E-06	0.06%
WFFELBR	5/21/2019	6.75E-10	1.72E-09	4.10E-06	0.02%
WFFELBR	6/18/2019	1.91E-09	3.18E-09	4.10E-06	0.05%
WFFELBR	7/16/2019	1.21E-09	2.55E-09	4.10E-06	0.03%
WFFELBR	8/27/2019	3.47E-09	2.44E-09	4.10E-06	0.08%
WFFELBR	9/24/2019	3.50E-10	3.50E-09	4.10E-06	0.01%
WFFELBR	10/22/2019	6.60E-10	2.34E-09	4.10E-06	0.02%
WFFELBR	11/19/2019	1.28E-09	3.54E-09	4.10E-06	0.03%
WFFELBR	12/17/2019	-1.60E-09	2.32E-09	4.10E-06	-0.04%
WFFELBR	1/28/2020	-8.14E-11	2.11E-09	4.10E-06	0.00%
WFFELBR	2/25/2020	-3.30E-09	2.21E-09	4.10E-06	-0.08%
WFFELBR	3/24/2020	6.85E-10	2.15E-09	4.10E-06	0.02%
WFFELBR	4/21/2020	1.36E-09	1.97E-09	4.10E-06	0.03%
WFFELBR	5/19/2020	-1.68E-09	2.77E-09	4.10E-06	-0.04%
WFFELBR	6/16/2020	-1.39E-09	2.47E-09	4.10E-06	-0.03%
WFFELBR	7/28/2020	2.95E-10	2.19E-09	4.10E-06	0.01%
WFFELBR	8/25/2020	4.26E-09	4.25E-09	4.10E-06	0.10%
WFFELBR	9/22/2020	1.94E-09	1.96E-09	4.10E-06	0.05%
WFFELBR	10/20/2020	-3.78E-09	3.35E-09	4.10E-06	-0.09%
WFFELBR	11/17/2020	1.13E-09	2.23E-09	4.10E-06	0.03%
WFFELBR	12/15/2020	2.64E-09	2.27E-09	4.10E-06	0.06%
WFFELBR	1/26/2021	4.46E-10	2.01E-09	4.10E-06	0.01%

WFFELBR	2/23/2021	8.35E-10	2.14E-09	4.10E-06	0.02%
WFFELBR	3/23/2021	0.00E+00	6.76E-09	4.10E-06	0.00%
WFFELBR	4/20/2021	2.37E-09	3.41E-09	4.10E-06	0.06%
WFFELBR	5/18/2021	1.81E-10	3.14E-09	4.10E-06	0.00%
WFFELBR	6/15/2021	1.04E-10	2.05E-09	4.10E-06	0.00%
WFFELBR	7/27/2021	-5.29E-10	2.46E-09	4.10E-06	-0.01%
WFFELBR	8/24/2021	-2.11E-09	2.82E-09	4.10E-06	-0.05%
WFFELBR	9/21/2021	-3.32E-10	1.28E-09	4.10E-06	-0.01%
WFFELBR	10/19/2021	1.48E-09	2.18E-09	4.10E-06	0.04%
WFFELBR	11/16/2021	1.45E-09	4.15E-09	4.10E-06	0.04%
WFFELBR	12/28/2021	-1.84E-09	2.22E-09	4.10E-06	-0.04%
WFFELBR	1/25/2022	-1.58E-09	3.21E-09	4.10E-06	-0.04%
WFFELBR	2/22/2022	6.82E-10	2.46E-09	4.10E-06	0.02%
WFFELBR	3/22/2022	-3.06E-09	2.57E-09	4.10E-06	-0.07%
WFFELBR	4/19/2022	2.02E-10	2.35E-09	4.10E-06	0.00%
WFFELBR	5/17/2022	-6.52E-10	1.79E-09	4.10E-06	-0.02%
WFFELBR	6/28/2022	8.86E-10	1.84E-09	4.10E-06	0.02%
WFFELBR	7/26/2022	4.63E-10	2.65E-09	4.10E-06	0.01%
WFFELBR	8/23/2022	-1.32E-09	2.86E-09	4.10E-06	-0.03%
WFFELBR	9/20/2022	4.46E-09	6.41E-09	4.10E-06	0.11%

