Identification of Select Emerging Compounds in Public Water Supply Reservoirs of the Yadkin and Broad River Basins

Yadkin and Broad River Basins

NORTH CAROLINA DEPARTMENT OF ENVIRONMENTAL QUALITY
DIVISION OF WATER RESOURCES
WATER SCIENCES SECTION

THIS REPORT HAS BEEN APPROVED FOR RELEASE

_____ _____

Chris Johnson
Chief, Water Sciences Section

DATE:_____March 7, 2024_____

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The revision corrects a typographical error in coordinates in Table 1.

DATE: _ _____July 8, 2024_____

Chris Johnson, Chief, Water Sciences Section

Division of Water Resources Identification of Select Emerging PFAS Compounds in Public Water Supply Reservoirs of the Yadkin and Broad River Basin (2021)

Introduction

In response to the rising interest in the public health effects associated with per- and polyfluoroalkyl substances (PFAS) in drinking water sources, the Intensive Survey Branch (ISB) conducted a special study alongside our Ambient Lakes Monitoring Program to characterize the presence and concentrations of these emerging compounds (EC) in public drinking water supply reservoirs of the Yadkin and Broad River basins. Beginning in May of 2021, ISB staff collected surface water samples for 28 different per- and polyfluoroalkyl substances at ambient lakes monitoring stations nearest to the surface water intake of ten public water supply reservoirs in the Yadkin and Broad River basins. Analytical results indicated the presence of at least one PFAS analyte above the laboratory practical quantitation limit (PQL [2 ng/L]) in each waterbody aside from Roberdel Lake during the 2021 sampling season. It is important to note that all analytical data presented in this document reflect levels of target analytes detected in untreated surface waters, as opposed to finished drinking water.

Background

This study follows a previous survey conducted by ISB in 2018 evaluating the presence of PFAS in public water supply reservoirs in the Cape Fear, New, and Watauga River Basins, which highlighted the ubiquitous distribution of these emerging compounds. As well as a survey conducted by ISB in 2020 evaluating the presence of PFAS in public water supply reservoirs in the Neuse River basin. PFAS were selected as compounds of interest for this study in response to the rising interest in the public health effects of consumption of these compounds in drinking water sources. In 2020, the Division of Water Resources (DWR) expansion of the Organic Chemistry Branch to include the capability of analyzing PFAS allowed for increased analytical capacity. Samples from the selected locations (Table 1 & Figure 1) were collected monthly from May to September 2021. Water Sciences Section 4 Intensive Survey Branch Per- and Polyfluorinated Alkyl Substances (PFAS) are a class of synthetic chemicals used in the production of a wide variety of manufactured goods. These compounds are composed of fluorinated carbon chains that readily transport in the environment and are highly resistant to degradation. There are many different possible sources of PFAS contamination in surface water, including industrial and consumer derived waste. PFAS are used in various consumer products including non-stick cookware, water-repellent clothing, stain resistant fabrics, cosmetics, food packaging materials, and fire-retardant foams. Although 28 PFAS compounds were the focus of this study, thousands of PFAS compounds exist. Of these compounds, PFOA and PFOS have been the most extensively produced and studied. The USEPA has stated that exposure to PFAS can lead to adverse health effects in humans. Though many companies have significantly decreased or ceased use of PFOA and PFOS in manufacturing, other PFAS compounds are currently being used as replacements. The USEPA established health advisory level in finished drinking water for PFOA and PFOS are 0.004 ng/l and 0.02 ng/l respectively. Health Advisory levels identify the concentration of a compound in drinking water below which adverse health effects in the most sensitive populations are not anticipated to occur over specific exposure durations. A health advisory value is not a legally enforceable federal standard and is subject to change as additional information becomes available. The 28 PFAS compounds selected for this study are abbreviated throughout this document for better readability but are identified more fully in Appendix 1

Methods

Selected sites were sampled in conjunction with regularly scheduled sampling events as part of Ambient Lakes Monitoring Program (ALMP). Samples were collected in accordance with Intensive Survey Branch (ISB) Standard Operating Procedures Manual: Per- and Polyfluorinated Alkyl Substances (PFAS) - Field Collection Method v1.0, 2019, ISB's Standard Operating Procedures Manual: Physical and Chemical Monitoring v2.1, Dec. 2014 and Ambient Lakes Quality Assurance Project Plan v2.0, March 2014. Physical parameters were collected at surface (0.15 m) using an In-Situ multiparameter hydrosonde. Chemical samples were collected as surface grab samples. All PFAS samples were analyzed by the DWR central laboratory in Raleigh, NC. Appropriate QA/QC samples were collected during each sampling event including trip blanks, field blanks, duplicates, matrix spikes and matrix spike duplicates. Guidance on acceptable supplies, equipment, and personal care products is provided within the ISB Standard Operating Procedures Manual: Per- and Polyfluorinated Alkyl Substances (PFAS) - Field Collection Method.

WATERBODY NAME	LATITUDE	LONGITUDE
BLEWETT FALLS LAKE	34.98888	-79.883
LAKE STEWARD	35.03615	-80.4781
WATER LAKE	34.89993	-79.6699
ROCKINGHAM CITY LAKE	34.93793	-79.7384
ROBERDEL LAKE	34.97156	-79.7436
CONCORD LAKE	35.47858	-80.586
CODDLE CREEK RESERVOIR	35.43900	-80.70300
LAKE FISHER	35.48678	-80.5783
KANNAPOLIS LAKE	35.51333	-80.6481
LAKE TILLERY	35.228	-80.083
BACK CREEK LAKE	35.7362	-79.8778
BUNCH LAKE	35.72133	-79.8602
LAKE REESE	35.68205	-79.9701
BADIN LAKE	35.46476	-80.1238
TUCKERTOWN RESERVOIR	35.492	-80.179
HIGHROCK LAKE	35.60595	-80.2366
KINGS MOUNTAIN RESERVOIR	35.27816	-81.4554
HAMPTON LAKE	36.128165	-80.732493
LAKE TOM-A-LEX	36.894002	-80.181002
SALEM LAKE	36.0950027	-80.1910027

Table 1. *Station ID, description, and coordinates of 2021 ALMP sampled sites*

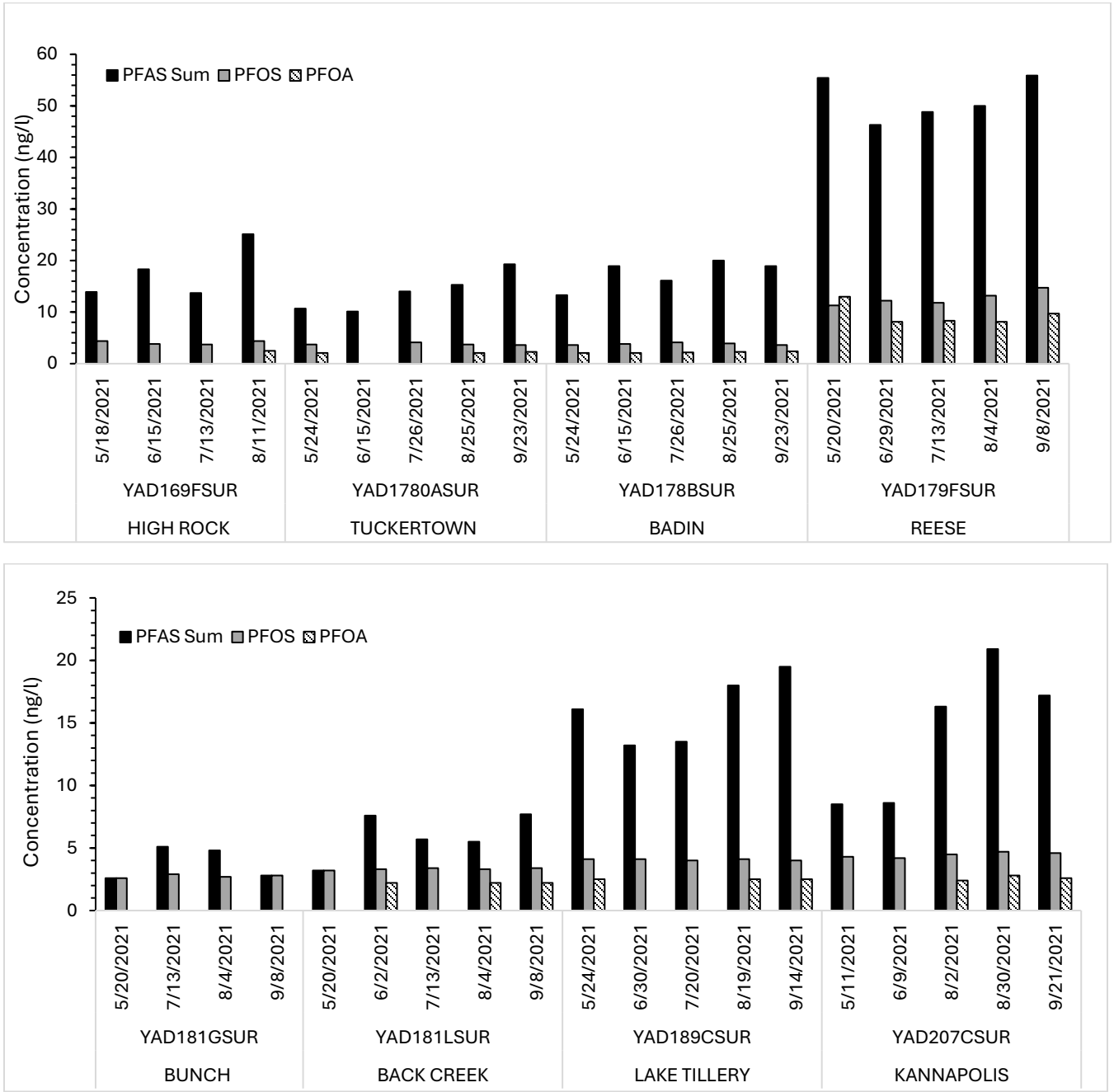
Results

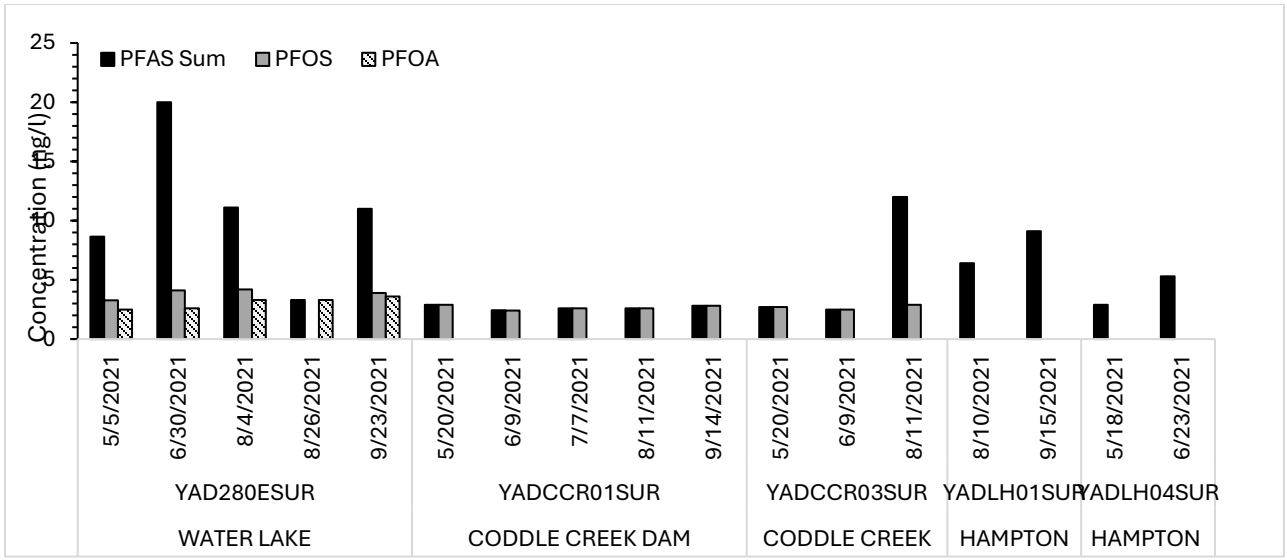
PFAS analysis was conducted by DWR at the Central Laboratory in Raleigh, NC. Of the 28 PFAS compounds selected for this study, the following seventeen compounds were found above the PQL on at least one occasion: PFBA; PFBS; PFHxA; PFHxS; PFOA; PFOS; PFPeA; PFHpA; PFHpS; 11cl-PF3ONS; N-EtFOSAA; PFDOA;PFDS; PFHpA; PFHpS; PFTeDA, N-MeFOSAA. These results again demonstrate the widespread distribution of detectable PFAS in public lakes and reservoirs. Values of detected compounds and the associated detection dates for sites with compounds above the PQL are listed in the appendix 2 below.

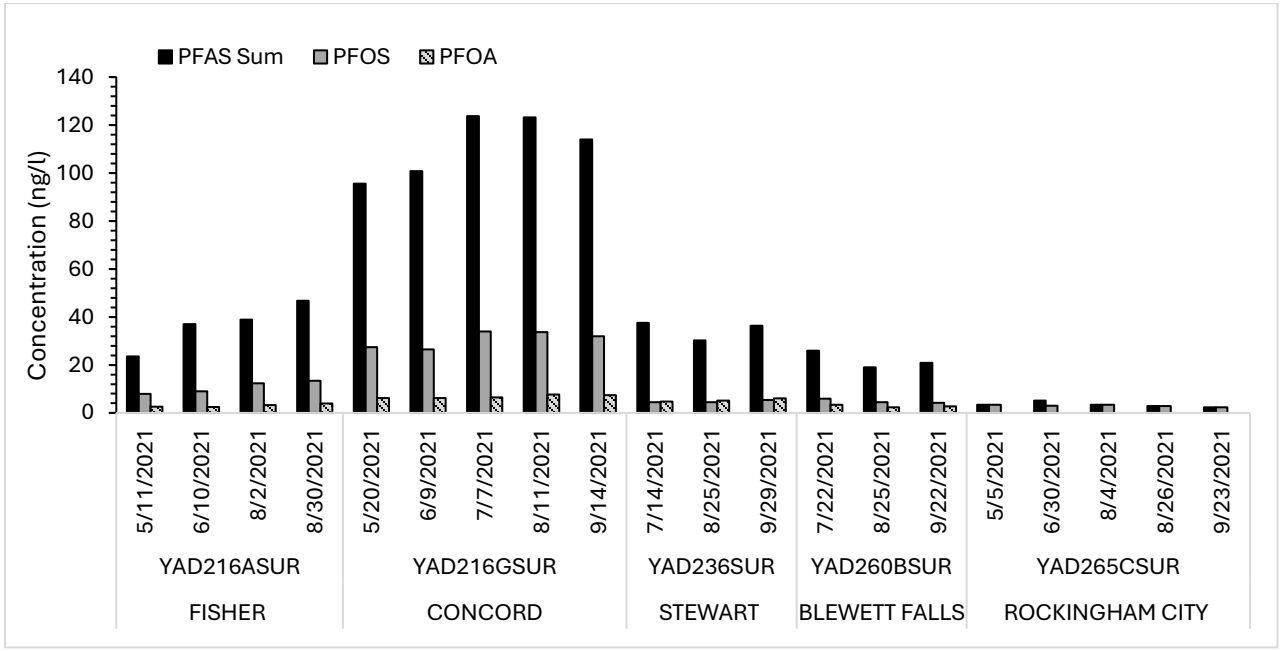
Summary

Evaluation of physical and chemical result from this study suggest that while there are detectable levels of target analytes at all public water supply reservoirs tested in the Yadkin and Broad River Basins, with the exception of Roberdel Reservoir, additional long-term monitoring would need to be conducted to evaluate persistence of these compounds and their associated effects on drinking water. Lake Concord (YAD216GSUR) exhibited the greatest diversity of target analytes (n=10). Lake Concord also exhibited highest total single event PFAS concentration (123.7 ng/L) as well as the second highest total PFAS concentration for a single sampling event (123.2 ng/L) and was constantly elevated throughout the sampling season, primarily driven by a combination of PFHxS and PFOS analytes. The highest PFOA concentration was also detected at Lake Reese (13 ng/l) and the highest PFOS concentration was detected at Lake Concord (34 ng/l).

***Figure 1**. Per- and polyfluoroalkyl concentrations at ambient lakes monitoring stations nearest the surface water intake of 20 public water supply reservoirs in the Yadkin River Basin. Only values greater than the PQL (2 ng/l)*




PFAS Sum
PFOS
PFOA
Concentration (ng/l)
25
20
15
10
5
0
5/5/2021
6/30/2021
8/4/2021
8/26/2021
9/23/2021
5/20/2021
6/9/2021
7/7/2021
8/11/2021
9/14/2021
5/20/2021
6/9/2021
8/11/2021
8/10/2021
9/15/2021
5/18/2021
6/23/2021
YAD280ESUR
WATER LAKE
YADCCR01SUR
CODDLE CREEK DAM
YADCCR03SUR
CODDLE CREEK
YADLH01SUR
HAMPTON
YADLH04SUR
HAMPTON


PFAS Sum
PFOS
PFOA
Concentration (ng/l)
140
120
100
80
60
40
20
0
5/11/2021
6/10/2021
8/2/2021
8/30/2021
5/20/2021
6/9/2021
7/7/2021
8/11/2021
9/14/2021
7/14/2021
8/25/2021
9/29/2021
7/22/2021
8/25/2021
9/22/2021
5/5/2021
6/30/2021
8/4/2021
8/26/2021
9/23/2021
YAD216ASUR
FISHER
YAD216GSUR
CONCORD
YAD236SUR
STEWART
YAD260BSUR
BLEWETT FALLS
YAD265CSUR
ROCKINGHAM CITY

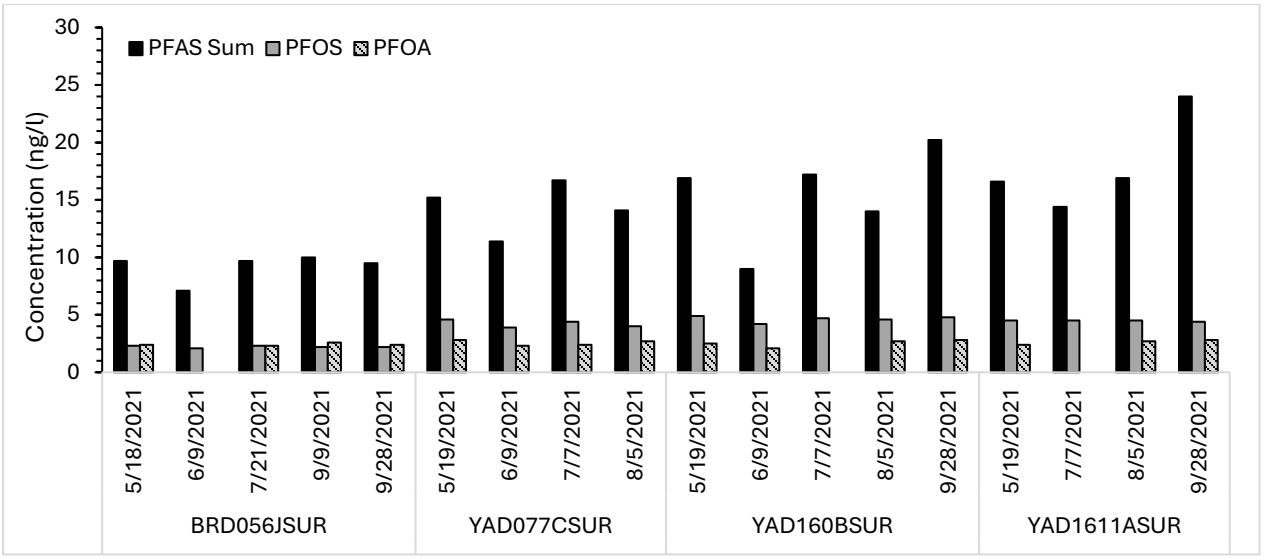


Figure 2. *Per- and polyfluoroalkyl average concentrations at ambient lakes monitoring stations nearest the surface water intake of 20 public water supply reservoirs in the Yadkin River Basin. Only values greater than the PQL (2 ng/l).*

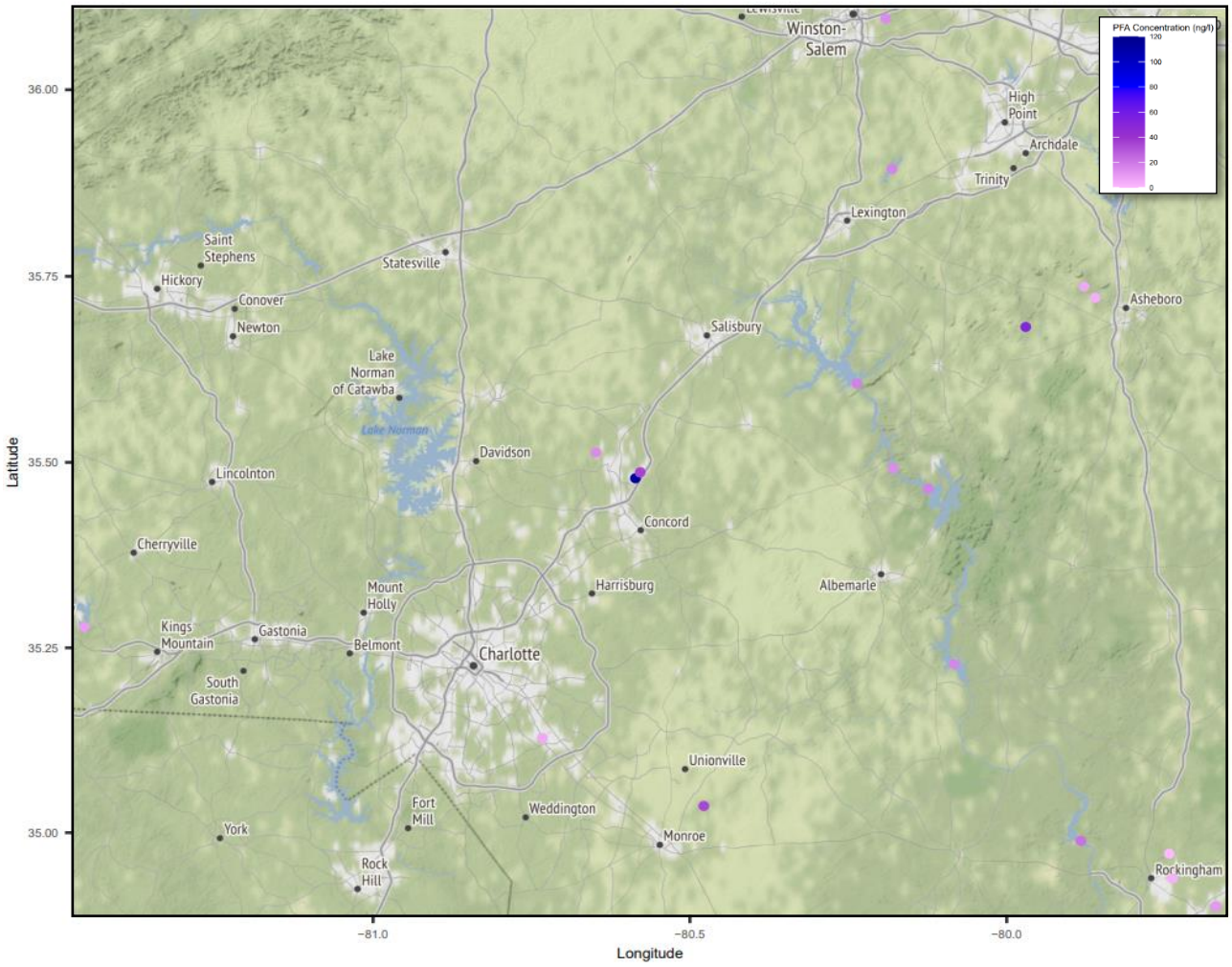
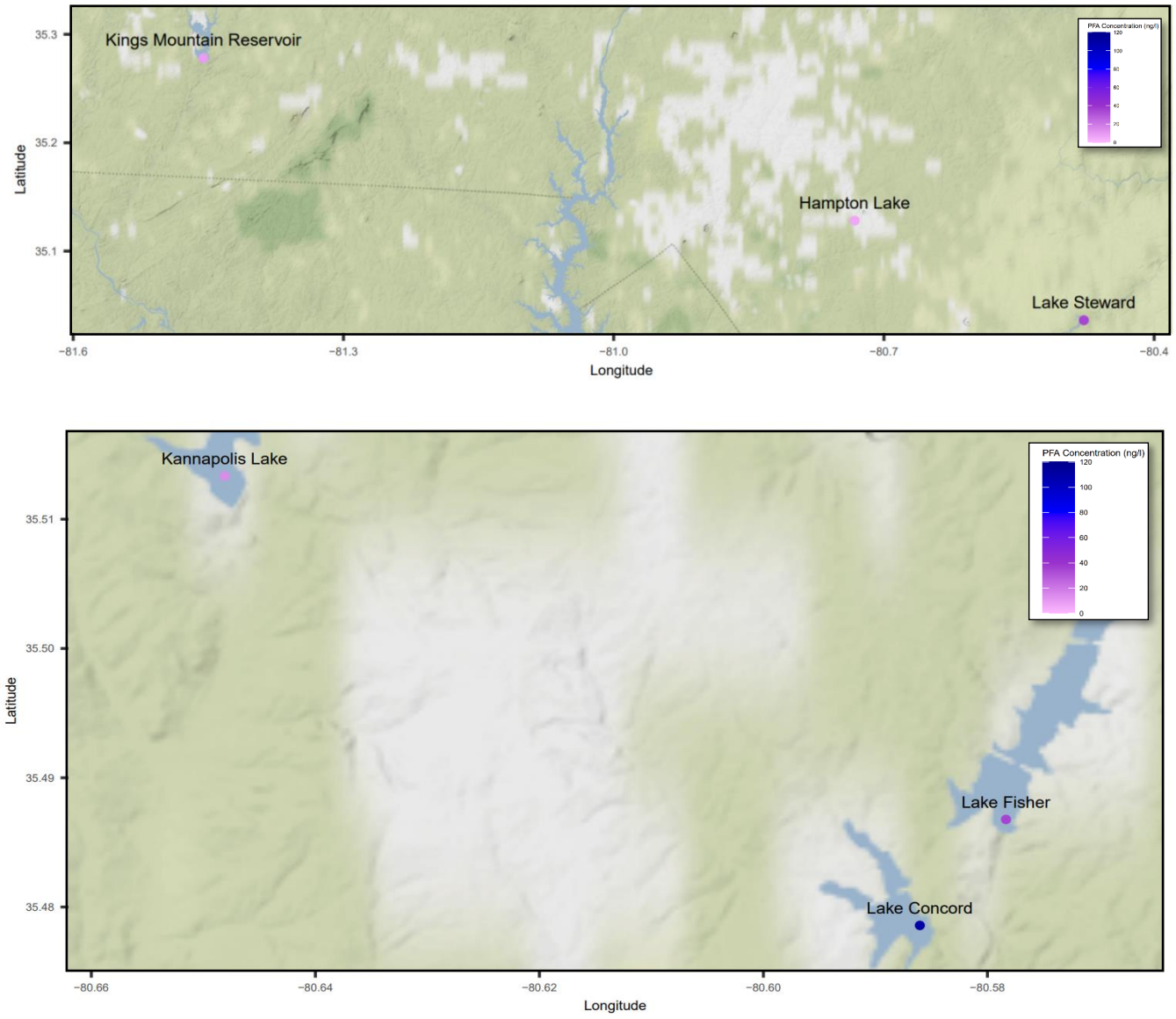
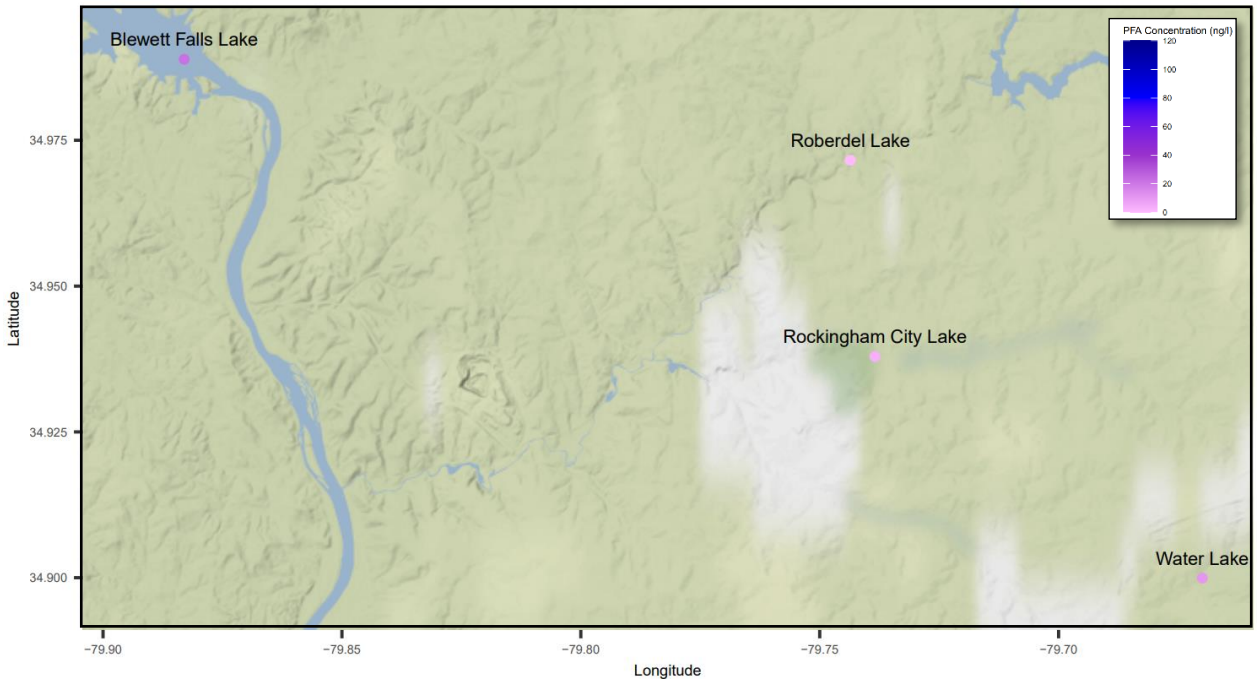
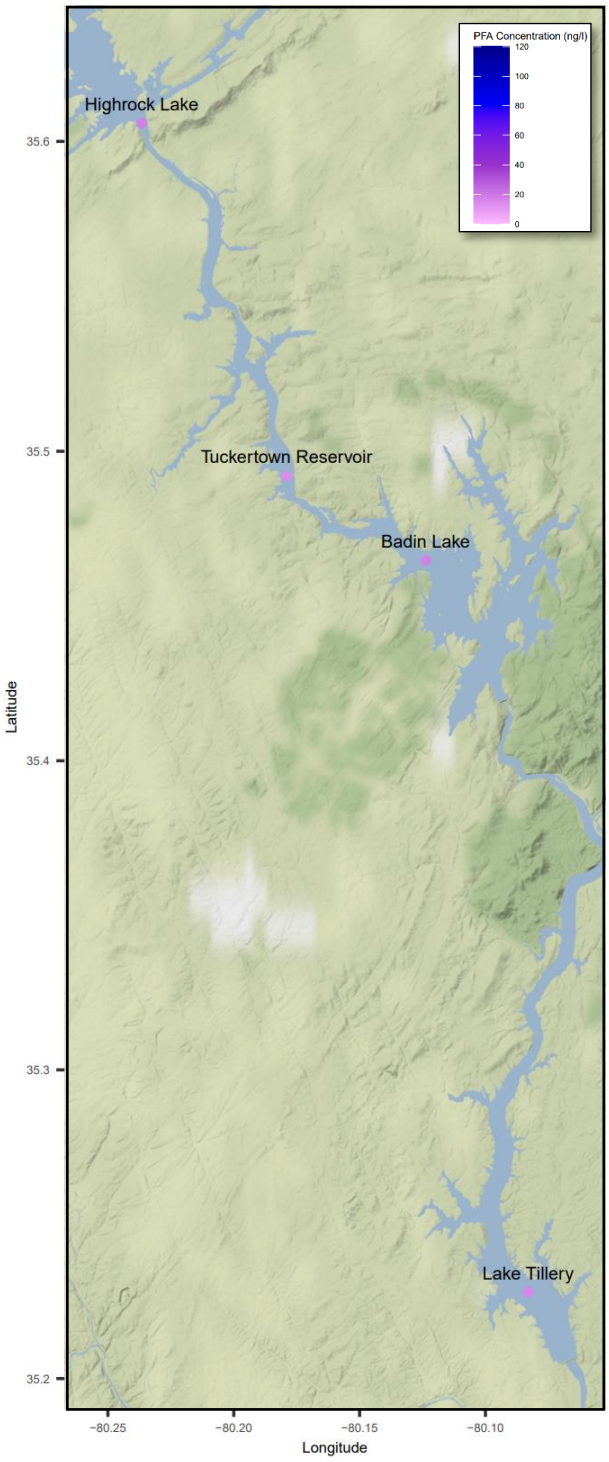
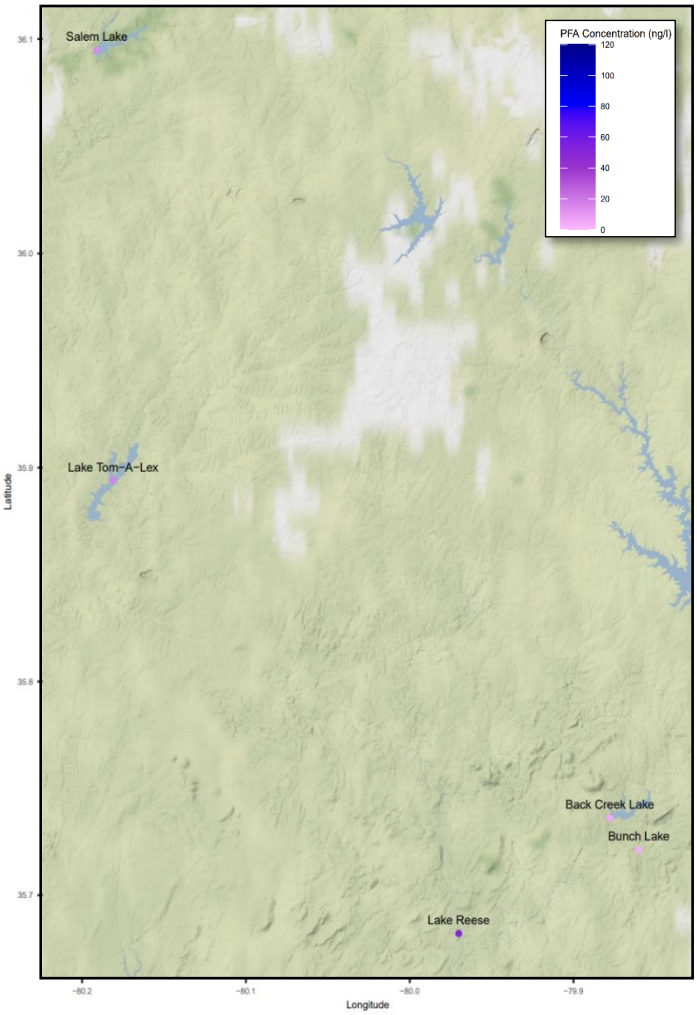


Figure 3. *Yadkin and Broad River Basin regional heatmap tiles depicting average Per- and polyfluoroalkyl concentrations at ambient lakes monitoring stations nearest the surface water intake of public water supply reservoirs.*




Blewett Falls Lake
Roberdel Lake
Rockingham City Lake
Water Lake
PFA Concentration (ng/l)
120
100
80
60
40
20
0
34.975
34.950
34.925
34.900
Latitude
−79.90
−79.85
−79.80
−79.75
−79.70
Longitude


PFA Concentration (ng/l)
120
100
80
60
40
20
0
Highrock Lake
Tuckertown Reservoir
Badin Lake
Lake Tillery
35.6
35.5
35.4
35.3
35.2
Latitude
−80.25
−80.20
−80.15
−80.10
Longitude


PFA Concentration (ng/l)
120
100
80
60
40
20
0
Salem Lake
Lake Tom-A-Lex
Back Creek Lake
Bunch Lake
Lake Reese
36.1
36.0
35.9
35.8
35.7
Latitude
−80.2
−80.1
−80.0
−79.9
Longitude

Appendix 1. *List of 28 analyzed PFAS compounds screened by the NCDEQ Chemistry Laboratory*

Abbreviation	***Name***	***CAS#***
PFBA	Perfluorobutanoate	45048-62-2
PFPeA	Perfluoropentanoate	45167-47-3
PFHxA	Perfluorohexanoate	92612-52-7
PFHpA	Perfluoroheptanoate	120885-29-2
PFOA	Perfluorooctanoate	45285-51-6
PFNA	Perfluorononanoate	72007-68-2
PFDA	Perfluorodecanoate	73829-36-4
PFUnA	Perfluoroundecanoate	196859-54-8
PFDoA	Perfluorododecanoate	171978-95-3
PFTrDA	Perfluorotridecanoate	862374-87-6
PFTeDA	Perfluorotetradecanoate	365971-87-5
PFBS	Perfluorobutanesulfonate	45187-15-3
PFPeS	Perfluoropentanesulfonate	175905-36-9
PFHxS	Perfluorohexanesulfonate	108427-53-8
PFHpS	Perfluoroheptanesulfonate	146689-46-5
PFOS	Perfluorooctanesulfonate	45298-90-6
PFNS	Perfluorononanesulfonate	474511-07-4
PFDS	Perfluorodecanesulfonate	126105-34-8
PFDoS	Perfluorododecanesulfonate	343629-43-6
4:2 FTS	4:2 fluorotelomersulfonate	414911-30-1
6:2 FTS	6:2 fluorotelomersulfonate	425670-75-3
8:2 FTS	8:2 fluorotelomersulfonate	481071-78-7
N-MeFOSAA	N-Methylperfluorooctanesulfonamidoacetic acid	2355-31-9
N-EtFOSAA	N-Ethylperfluorooctanesulfonamidoacetic acid	2991-50-6
HFPO-DA	Hexafluoropropylene oxide dimer acid	13252-13-6
ADONA	4,8-dioxa-3H-perfluorononanoic acid	919005-14-4
11Cl-PFOUdS	11-chloroeicosafluoro-3-oxaundecane-1-sulfonic acid	763051-92-9
9Cl-PF3ONS	9-chlorohexadecafluoro-3-oxanone-1-sulfonic acid	756426-58-1

Appendix 2 follows. *Values of detected PFAS compounds and detection date for sites with values above PQLs.*

Site ID	Site Description	Date	PFAS Sum	Analytes Detected	Analytes Below PQL	Analyte Range (ng/L)	Analyte	Result (ng/l)	PFAS Compounds below PQL
YAD265CSUR	ROCKINGHAM CITY LAKE	5/5/21	3.38	1	27	-	PFOS	3.378	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA;PFBS; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxA; PFHxS; PFNA; PFNS; PFOA; PFPeA; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD280ESUR	WATER LAKE	5/5/21	8.64	3	25	2.47-2.88	PFHxS PFOA PFOS	2.885 2.476 3.279	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA;PFBS; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxA; PFNA; PFNS; PFPeA; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD207CSUR	KANNAPOLIS LAKE	5/11/21	8.495	3	25	2.1-4.3	PFBS PFHxS PFOS	2.073 2.134 4.288	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxA; PFNA; PFNS; PFOA; PFPeA; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD216ASUR	LAKE FISHER	5/11/21	23.5	6	22	2.5-7.9	PFBS PFHxA PFHxS PFOA PFOS	2.5 2.6 5.1 2.6 7.9	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA;PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFNA; PFNS;

Site ID	Site Description	Date	PFAS Sum	Analytes Detected	Analytes Below PQL	Analyte Range (ng/L)	Analyte	Result (ng/l)	PFAS Compounds below PQL
							PFPeA	2.8	PFPeS;PFTeDA;PFTrDA; PFUnA
BRD056JSUR	KINGS MOUNTAIN RESERVOIR	5/18/21	9.7	4	24	2.3-2.7	PFHxA PFOA PFOS PFPeA	2.7 2.4 2.3 2.3	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA;PFBS; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxS; PFNA; PFNS; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD169FSUR	HIGH ROCK LAKE	5/18/21	13.9	4	24	2.5-4.4	PFBS PFHxA PFOS PFPeA	2.5 3.9 4.4 3.1	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA;PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxS; PFNA; PFNS; PFOA; PFPeS;PFTeDA;PFTrDA; PFUnA
YADLH04SUR	LAKE HAMPTON	5/18/21	2.90	1	27	-	PFBS	2.9	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxA; PFHxS; PFNA; PFNS; PFOA;PFOS; PFPeA; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD077CSUR	SALEM LAKE	5/19/21	12.8	4	24	2.2-4.6	PFHxA PFHxS PFOA PFOS	2.2 3.2 2.8 4.6	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA;PFBS; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFNA; PFNS; PFPeA; PFPeS;PFTeDA;PFTrDA; PFUnA

Site ID	Site Description	Date	PFAS Sum	Analytes Detected	Analytes Below PQL	Analyte Range (ng/L)	Analyte	Result (ng/l)	PFAS Compounds below PQL
YAD160BSUR	LAKE TOM-A-LEX	5/19/21	16.9	6	22	2.1-4.9	PFBS PFHxA PFHxS PFOA PFOS PFPeA	2.2 2.2 3 2.5 4.9 2.1	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFNA; PFNS; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD1611ASUR	LAKE TOM-A-LEX	5/19/21	16.6	6	22	2.2-4.5	PFBA PFHxA PFHxS PFOA PFOS PFPeA	2.2 2.3 2.7 2.4 4.5 2.5	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA;PFBS; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFNA; PFNS; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD179FSUR	LAKE REESE	5/20/21	55.4	7	21	4.2-13.0	PFBS PFHpA PFHxA PFHxS PFOA PFOS PFPeA	7.8 4.5 7 4.2 11.3 13 7.6	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA; PFDA; PFDoA; PFDoS; PFDS; PFHpS;PFNA; PFNS;PFPeS;PFTeDA;PFTrDA; PFUnA
YAD181GSUR	BUNCH LAKE	5/20/21	2.6	1	27	-	PFOS	2.6	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA;PFBS; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxA; PFHxS; PFNA; PFNS; PFOA; PFPeA; PFPeS;PFTeDA;PFTrDA; PFUnA

Site ID	Site Description	Date	PFAS Sum	Analytes Detected	Analytes Below PQL	Analyte Range (ng/L)	Analyte	Result (ng/l)	PFAS Compounds below PQL
YAD181LSUR	BACK CREEK LAKE	5/20/21	3.2	1	27	-	PFOS	3.2	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA;PFBS; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxA; PFHxS; PFNA; PFNS; PFOA; PFPeA; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD216GSUR	LAKE CONCORD	5/20/21	95.6	9	19	3.5-27.4	PFBA PFBS PFHpA PFHxA PFHxS PFOA PFOS PFPeA PFPeS	3.8 8.9 3.5 7.2 27.1 6.2 27.4 6.8 4.7	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFDA; PFDoA; PFDoS; PFDS; PFHpS; PFNA; PFNS; PFTeDA;PFTrDA; PFUnA
YADCCR01SUR	CODDLE CREEK RESERVOIR	5/20/21	2.9	1	27	-	PFOS	2.9	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA;PFBS; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxA; PFHxS; PFNA; PFNS; PFOA; PFPeA; PFPeS;PFTeDA;PFTrDA; PFUnA
YADCCR03SUR	CODDLE CREEK RESERVOIR	5/20/21	2.7	1	28	-	PFOS	2.7	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA;PFBS; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxA; PFHxS; PFNA;

Site ID	Site Description	Date	PFAS Sum	Analytes Detected	Analytes Below PQL	Analyte Range (ng/L)	Analyte	Result (ng/l)	PFAS Compounds below PQL
									PFNS; PFOA; PFPeA; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD1780ASUR	TUCKERTOWN RESERVOIR	5/24/21	10.7	4	24	2.1-3.7	PFOS PFHxA PFOA PFPeA	3.7 2.7 2.1 2.2	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA;PFBS; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxS; PFNA; PFNS; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD178BSUR	BADIN LAKE	5/24/21	13.3	5	23	2.1-3.6	PFBS PFHxA PFOA PFOS PFPeA	2.1 3 2.1 3.6 2.5	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA;PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxS; PFNA; PFNS; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD189CSUR	LAKE TILLERY	5/24/21	16.1	5	23	2.3-4.1	PFBS PFHxA PFOA PFOS PFPeA	2.3 4 2.5 4.1 3.2	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA;PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS;PFHxS; PFNA; PFNS; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD181LSUR	BACK CREEK LAKE	6/2/21	7.6	3	25	2.1-3.3	HFPO-DA PFOA	2.1 2.2	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA;PFBS; PFDA;

Site ID	Site Description	Date	PFAS Sum	Analytes Detected	Analytes Below PQL	Analyte Range (ng/L)	Analyte	Result (ng/l)	PFAS Compounds below PQL
							PFOS	3.3	PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxA; PFHxS; PFNA; PFNS; PFPeA; PFPeS;PFTeDA;PFTrDA; PFUnA
BRD056JSUR	KINGS MOUNTAIN RESERVOIR	6/9/21	7.1	3	25	2.1-2.5	PFHxA PFOS PFPeA	2.5 2.1 2.5	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA;PFBS; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxS; PFNA; PFNS; PFOA; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD077CSUR	SALEM LAKE	6/9/21	11.4	4	24	2.3-3.9	PFBS PFHxS PFOA PFOS	2.3 2.9 2.3 3.9	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA;PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxA;PFNA; PFNS; PFPeA; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD160BSUR	LAKE TOM-A-LEX	6/9/21	9	3	25	2.1-4.2	PFHxS PFOA PFOS	2.7 2.1 4.2	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA;PFBS; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxA; PFNA; PFNS; PFPeA; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD207CSUR	KANNAPOLIS LAKE	6/9/21	8.6	3	25	2.2-4.2	PFBS PFHxS	2.2 2.2	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-

Site ID	Site Description	Date	PFAS Sum	Analytes Detected	Analytes Below PQL	Analyte Range (ng/L)	Analyte	Result (ng/l)	PFAS Compounds below PQL
							PFOS	4.2	EtFOSAA; N-MeFOSAA; PFBA;PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxA; PFNA; PFNS; PFOA; PFPeA; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD216GSUR	LAKE CONCORD	6/9/21	100.8	9	19	3.5-31.3	PFBA PFBS PFHpA PFHxA PFHxS PFOA PFOS PFPeA PFPeS	3.9 9.1 3.5 7.57 31.3 6.2 26.5 7.3 5.4	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFDA; PFDoA; PFDoS; PFDS; PFHpS; ; PFNA; PFNS; PFTeDA;PFTrDA; PFUnA
YADCCR01SUR	CODDLE CREEK RESERVOIR	6/9/21	2.43	1	27	-	PFOS	2.4	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA;PFBS; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxA; PFHxS; PFNA; PFNS; PFOA; PFPeA; PFPeS;PFTeDA;PFTrDA; PFUnA
YADCCR03SUR	CODDLE CREEK RESERVOIR	6/9/21	2.5	1	27	-	PFOS	2.5	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA;PFBS; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxA; PFHxS; PFNA; PFNS; PFOA; PFPeA; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD216ASUR	LAKE FISHER	6/10/21	37	9	19	2.5-6.8	PFBA N-EtFOSAA	3.3 3.7	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS;

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							N-MeFOSAA	2.9	HPFO-DA; NaDONA; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFNA; PFNS; PFPeS;PFTeDA;PFTrDA; PFUnA
							PFBS	3	
							PFHxA	2.8	
							PFHxS	6.8	
							PFOA	2.5	
							PFOS	9	
							PFPeA	3	
YAD169FSUR	HIGH ROCK LAKE	6/15/21	18.3	5	23	2.7-5.8	PFBS	2.9	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHxS; PFNA; PFNS; PFOA; PFPeS;PFTeDA;PFTrDA; PFUnA
							PFHpS	5.8	
							PFHxA	3.1	
							PFOS	3.8	
							PFPeA	2.7	
YAD1780ASUR	TUCKERTOWN RESERVOIR	6/15/21	10.1	3	25	2.6-4.2	PFBS	2.6	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA;PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxS; PFNA; PFNS; PFOA;PFOS; PFPeS;PFTeDA;PFTrDA; PFUnA
							PFHxA	4.2	
							PFPeA	3.3	
YAD178BSUR	BADIN LAKE	6/15/21	18.9	6	22	2.1-4	PFBS	2.3	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFNA; PFNS; PFPeS;PFTeDA;PFTrDA; PFUnA
							PFHpS	3.5	
							PFHxA	4	
							PFOA	2.1	
							PFOS	3.8	
							PFPeA	3.2	
YADLH04SUR	LAKE HAMPTON	6/23/21	5.3	2	26	2.1-3.2	PFBS	3.2	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-

Site ID	Site Description	Date	PFAS Sum	Analytes Detected	Analytes Below PQL	Analyte Range (ng/L)	Analyte	Result (ng/l)	PFAS Compounds below PQL
							PFPeA	2.1	EtFOSAA; N-MeFOSAA; PFBA; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxA; PFHxS; PFNA; PFNS; PFOA;PFOS; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD179FSUR	LAKE REESE	6/29/21	46.3	8	20	3-12.2	PFBA PFBS PFHpA PFHxA PFHxS PFOA PFOS PFPeA	3.6 5.2 3.6 5.2 3 8.1 12.2 5.4	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFDA; PFDoA; PFDoS; PFDS; PFHpS; PFNA; PFNS; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD189CSUR	LAKE TILLERY	6/30/21	11.1	3	25	3.1-4.1	PFHxA PFOS PFPeA	3.9 4.1 3.1	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA;PFBS; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxS; PFNA; PFNS; PFOA; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD265CSUR	ROCKINGHAM CITY LAKE	6/30/21	5.1	2	26	2.1-3	PFBS PFOS	2.1 3	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxA; PFHxS; PFNA; PFNS; PFOA; PFPeA; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD280ESUR	WATER LAKE	6/30/21	20	7	21	2.2-3.8	11Cl-PF3ONS N-EtFOSAA	2.4 2.5	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; HPFO-DA;

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							PFDoA	2.4	NaDONA; N-MeFOSAA;
							PFDS	2.2	PFBA;PFBS;
							PFHxS	3.8	PFDA;PFDoS;PFHpA; PFHpS;
							PFOA	2.6	PFHxA;PFNA; PFNS; PFPeA;
							PFOS	4.1	PFPeS;PFTeDA;PFTrDA; PFUnA
YAD077CSUR	SALEM LAKE	7/7/21	16.7	6	22	2.2-4.4	PFBS	2.4	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFNA; PFNS; ; PFPeS;PFTeDA;PFTrDA; PFUnA
							PFHxA	2.2	
							PFHxS	2.9	
							PFOA	2.4	
							PFOS	4.4	
							PFPeA	2.4	
YAD160BSUR	LAKE TOM-A-LEX	7/7/21	17.2	6	22	2.1-4.7	PFHpA	2.6	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA;PFBS; PFDA; PFDoA; PFDoS; PFDS; PFNA; PFNS; PFOA; PFPeS;PFTeDA;PFTrDA; PFUnA
							PFHpS	2.5	
							PFHxA	2.1	
							PFHxS	3.2	
							PFOS	4.7	
							PFPeA	2.1	
YAD1611ASUR	LAKE TOM-A-LEX	7/7/21	14.4	5	23	2.1-4.5	PFHpA	2.6	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA;PFBS; PFDA; PFDoA; PFDoS; PFDS; PFHpS; PFNA; PFNS; PFOA; PFPeS;PFTeDA;PFTrDA; PFUnA
							PFHxA	2.1	
							PFHxS	3.1	
							PFOS	4.5	
							PFPeA	2.1	
YAD216GSUR	LAKE CONCORD	7/7/21	123.7	10	18	2.3-35.4	PFBA	4	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFDA; PFDoA; PFDoS; PFDS;
							PFBS	10.5	
							PFHpA	5.6	
							PFHpS	2.3	
							PFHxA	9.2	
							PFHxS	35.4	

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							PFOA PFOS PFPeA PFPeS	6.4 34 9.2 7.1	PFNA; PFNS; PFTeDA;PFTrDA; PFUnA
YADCCR01SUR	CODDLE CREEK RESERVOIR	7/7/21	2.6	1	27	-	PFOS	2.6	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA;PFBS; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxA; PFHxS; PFNA; PFNS; PFOA; PFPeA; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD169FSUR	HIGH ROCK LAKE	7/13/21	13.7	4	24	2.4-3.7	PFBS PFHxA PFOS PFPeA	2.4 4 3.7 3.6	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxS; PFNA; PFNS; PFOA; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD179FSUR	LAKE REESE	7/13/21	48.8	8	20	3-11.8	PFBA PFBS PFHpA PFHxA PFHxS PFOA PFOS PFPeA	4.1 5.3 4.8 5.5 3 8.3 11.8 6	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFDA; PFDoA; PFDoS; PFDS; PFHpS; PFNA; PFNS; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD181GSUR	BUNCH LAKE	7/13/21	5.1	2	26	2.2-2.9	PFBA PFOS	2.2 2.9	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA;PFBS; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxA;

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									PFHxS; PFNA; PFNS; PFOA; PFPeA; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD181LSUR	BACK CREEK LAKE	7/13/21	5.7	2	26	2.3-3.4	PFHpS	2.3	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA;PFBS; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHxA; PFHxS; PFNA; PFNS; PFOA; PFPeA; PFPeS;PFTeDA;PFTrDA; PFUnA
							PFOS	3.4	
YAD236SUR	LAKE STEWART	7/14/21	37.6	8	20	2.4-9.5	PFBA	4.3	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFNA; PFNS; PFPeS;PFTeDA;PFTrDA; PFUnA
							PFBS	9.5	
							PFHpS	2.4	
							PFHxA	4.9	
							PFHxS	2.4	
							PFOA	4.7	
							PFOS	4.5	
							PFPeA	4.9	
YAD189CSUR	LAKE TILLERY	7/20/21	13.5	4	24	2.4-3.8	PFBS	2.4	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA;PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxS; PFNA; PFNS; PFOA; PFPeS;PFTeDA;PFTrDA; PFUnA
							PFHxA	3.8	
							PFOS	4	
							PFPeA	3.3	
BRD056JSUR	KINGS MOUNTAIN	7/21/21	9.7	4	24	2.3-2.7	PFHxA	2.7	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA;PFBS; PFDA; PFDoA; PFDoS; PFDS; PFHpA;
							PFOA	2.3	
							PFOS	2.3	
							PFPeA	2.4	

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									PFHpS; PFHxS; PFNA; PFNS; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD260BSUR	BLEWETT FALLS LAKE	7/22/21	26	6	22	2.6-5.9	PFBA PFBS PFHxA PFOA PFOS PFPeA	2.6 3.3 5.7 3.4 5.9 5.1	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxS; PFNA; PFNS; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD1780ASUR	TUCKERTOWN RESERVOIR	7/26/21	14	4	24	2.4-3.9	PFBS PFHxA PFOS PFPeA	2.4 3.9 4.1 3.6	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxS; PFNA; PFNS; PFOA; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD178BSUR	BADIN LAKE	7/26/21	16.1	5	23	2.2-4.1	PFBS PFHxA PFOA PFOS PFPeA	2.3 4.1 2.2 4.1 3.4	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA;PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxS; PFNA; PFNS; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD207CSUR	KANNAPOLIS LAKE	8/2/21	16.3	6	22	2.1-4.5	PFBS PFHxA PFHxS PFOA PFOS PFPeA	2.7 2.1 2.5 2.4 4.5 2.1	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFNA; PFNS; PFPeS;PFTeDA;PFTrDA; PFUnA

Site ID	Site Description	Date	PFAS Sum	Analytes Detected	Analytes Below PQL	Analyte Range (ng/L)	Analyte	Result (ng/l)	PFAS Compounds below PQL
YAD216ASUR	LAKE FISHER	8/2/21	38.9	6	22	3.3-12.3	PFBA PFBS PFHxA PFHxS PFOA PFOS PFPeA	3.7 3.7 3.7 8.4 3.3 12.3 3.8	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFNA; PFNS; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD179FSUR	LAKE REESE	8/4/21	50	8	20	3.1-13.2	PFBA PFBS PFHpA PFHxA PFHxS PFOA PFOS PFPeA	4.7 5.2 4.8 5.4 3.1 8.1 13.2 5.5	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFDA; PFDoA; PFDoS; PFDS; PFHpS; PFNA; PFNS; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD181GSUR	BUNCH LAKE	8/4/21	4.8	2	26	2.1-2.7	PFBA PFOS	2.1 2.7	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBS; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxA; PFHxS; PFNA; PFNS; PFOA; PFPeA; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD181LSUR	BACK CREEK LAKE	8/4/21	5.5	2	26	2.2-3.3	PFOA PFOS	2.2 3.3	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA;PFBS; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxA; PFHxS; PFNA; PFNS; PFPeA; PFPeS;PFTeDA;PFTrDA; PFUnA

Site ID	Site Description	Date	PFAS Sum	Analytes Detected	Analytes Below PQL	Analyte Range (ng/L)	Analyte	Result (ng/l)	PFAS Compounds below PQL
YAD265CSUR	ROCKINGHAM CITY LAKE	8/4/21	3.4	1	27	-	PFOS	3.4	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA;PFBS; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxA; PFHxS; PFNA; PFNS; PFOA;PFOS; PFPeA; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD280ESUR	WATER LAKE	8/4/21	11.1	3	25	3.3-4.2	PFHxS PFOA PFOS	3.6 3.3 4.2	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA;PFBS; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxA; PFNA; PFNS; PFPeA; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD077CSUR	SALEM LAKE	8/5/21 8/5/21 8/5/21 8/5/21 8/5/21	14.1	5	23	2.1-4	PFBS PFHxA PFHxS PFOA PFOS	2.5 2.1 2.8 2.7 4	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFNA; PFNS; PFPeA; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD160BSUR	LAKE TOM-A-LEX	8/5/21	14	5	23	2.1-4.6	PFBS PFHxA PFOA PFOS PFPeA	2.3 2.3 2.7 4.6 2.1	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxS; PFNA; PFNS; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD1611ASUR	LAKE TOM-A-LEX	8/5/21	16.9	6	22	2.2-4.5	PFBS	2.3	

Site ID	Site Description	Date	PFAS Sum	Analytes Detected	Analytes Below PQL	Analyte Range (ng/L)	Analyte	Result (ng/l)	PFAS Compounds below PQL
							PFHxA	2.3	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA;PFBS; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxA; PFHxS; PFNA; PFNS; PFOA;PFOS; PFPeA; PFPeS;PFTeDA;PFTrDA; PFUnA
							PFHxS	2.9	
							PFOA	2.7	
							PFOS	4.5	
							PFPeA	2.2	
YADLH01SUR	LAKE HAMPTON	8/10/21	6.4	2	26	2.5-3.9	PFBS	3.9	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxA; PFHxS; PFNA; PFNS; PFOA;PFOS; PFPeS;PFTeDA;PFTrDA; PFUnA
							PFPeA	2.5	
YAD169FSUR	HIGH ROCK LAKE	8/11/21	25.1	6	22	2.5-6.5	PFBA	2.9	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxS; PFNA; PFNS; PFPeS;PFTeDA;PFTrDA; PFUnA
							PFBS	2.8	
							PFHxA	6	
							PFOA	2.5	
							PFOS	4.4	
							PFPeA	6.5	
YAD216GSUR	LAKE CONCORD	8/11/21	123.2	9	19	4-36.7	PFBA	4	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFDA; PFDoA; PFDoS; PFDS;; PFHpS; PFNA; PFNS;PFTeDA;PFTrDA; PFUnA
							PFBS	11	
							PFHpA	4.1	
							PFHxA	9.7	
							PFHxS	36.7	
							PFOA	7.7	
							PFOS	33.7	
							PFPeA	9.3	

Site ID	Site Description	Date	PFAS Sum	Analytes Detected	Analytes Below PQL	Analyte Range (ng/L)	Analyte	Result (ng/l)	PFAS Compounds below PQL
							PFPeS	7	
YADCCR01SUR	CODDLE CREEK RESERVOIR	8/11/21	2.6	1	27	-	PFOS	2.6	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA;PFBS; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxA; PFHxS; PFNA; PFNS; PFOA; PFPeA; PFPeS;PFTeDA;PFTrDA; PFUnA
YADCCR03SUR	CODDLE CREEK RESERVOIR	8/11/21	12	5	23	2.1-2.9	11Cl-PF3ONS N-EtFOSAA PFDoA PFOS PFTeDA	2.2 2.3 2.1 2.9 2.5	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; HPFO-DA; NaDONA;; N-MeFOSAA; PFBA;PFBS; PFDA; PFDoA; PFDS; PFHpA; PFHpS; PFHxA; PFHxS; PFNA; PFNS; PFOA; PFPeA; PFPeS;PFTrDA; PFUnA
YAD189CSUR	LAKE TILLERY	8/19/21	18	6	22	2.1-4.1	PFBS PFHpA PFHxA PFOA PFOS PFPeA	2.2 2.1 3.8 2.5 4.1 3.3	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA;PFDA; PFDoA; PFDoS; PFDS; PFHpS; PFHxS; PFNA; PFNS; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD1780ASUR	TUCKERTOWN RESERVOIR	8/25/21	15.3	5	23	2.1-3.7	PFBS PFHxA PFOA PFOS PFPeA	2.5 3.4 2.1 3.7 3.6	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxS; PFNA; PFNS; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD178BSUR	BADIN LAKE	8/25/21	20	6	22	2.3-4.5	PFBA	2.3	

Site ID	Site Description	Date	PFAS Sum	Analytes Detected	Analytes Below PQL	Analyte Range (ng/L)	Analyte	Result (ng/l)	PFAS Compounds below PQL
							PFBS PFHxA PFOA PFOS PFPeA	2.6 4.4 2.3 3.9 4.5	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxS; PFNA; PFNS; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD236SUR	LAKE STEWART	8/25/21	30.2	6	22	4.1-7.5	PFBA PFBS PFHxA PFOA PFOS PFPeA	4.1 7.5 4.6 5.1 4.5 4.4	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS;PFHxS; PFNA; PFNS; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD260BSUR	BLEWETT FALLS LAKE	8/25/21	19	6	22	2.2-4.5	PFBA PFBS PFHxA PFOA PFOS PFPeA	2.2 2.3 3.9 2.3 4.5 3.8	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxS; PFNA; PFNS; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD265CSUR	ROCKINGHAM CITY LAKE	8/26/21	2.8	1	27	-	PFOS	2.8	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA;PFBS; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxA; PFHxS; PFNA; PFNS; PFOA; PFPeA; PFPeS;PFTeDA;PFTrDA; PFUnA

Site ID	Site Description	Date	PFAS Sum	Analytes Detected	Analytes Below PQL	Analyte Range (ng/L)	Analyte	Result (ng/l)	PFAS Compounds below PQL
YAD280ESUR	WATER LAKE	8/26/21	6.7	2	26	3.3-3.4	PFHxS	3.4	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA;PFBS; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxA; PFNA; PFNS; PFOS; PFPeA; PFPeS;PFTeDA;PFTrDA; PFUnA
							PFOA	3.3	
YAD207CSUR	KANNAPOLIS LAKE	8/30/21	20.9	7	21	2.3-4.7	PFBS	2.8	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA;PFDA; PFDoA; PFDoS; PFDS; PFHpS; PFNA; PFNS; PFPeS;PFTeDA;PFTrDA; PFUnA
							PFHpA	3.2	
							PFHxA	2.3	
							PFHxS	2.7	
							PFOA	2.8	
							PFOS	4.7	
							PFPeA	2.4	
YAD216ASUR	LAKE FISHER	8/30/21	46.7	9	19	2.1-13.4	N-EtFOSAA	2.5	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA; N-MeFOSAA; PFDA; PFDoA; PFDoS; PFDS; PFHpS; PFNA; PFNS; PFPeS;PFTeDA;PFTrDA; PFUnA
							PFBA	3.5	
							PFBS	3.7	
							PFHpA	2.1	
							PFHxA	4.1	
							PFHxS	9.2	
							PFOA	3.9	
							PFOS	13.4	
							PFPeA	4.3	
YAD179FSUR	LAKE REESE	9/8/21	55.9	8	20	3.4-14.7	PFBA	4.5	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFDA; PFDoA; PFDoS; PFDS; PFHpS; PFNA; PFNS; PFPeS;PFTeDA;PFTrDA; PFUnA
							PFBS	6.1	
							PFHpA	3.8	
							PFHxA	6.6	
							PFHxS	3.4	
							PFOA	9.7	
							PFOS	14.7	
							PFPeA	7.1	

Site ID	Site Description	Date	PFAS Sum	Analytes Detected	Analytes Below PQL	Analyte Range (ng/L)	Analyte	Result (ng/l)	PFAS Compounds below PQL
YAD181GSUR	BUNCH LAKE	9/8/21	2.8	1	27	-	PFOS	2.8	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA;PFBS; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxA; PFHxS; PFNA; PFNS; PFOA; PFPeA; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD181LSUR	BACK CREEK LAKE	9/8/21	7.7	3	25	2.1-3.4	PFBA PFOA PFOS	2.1 2.2 3.4	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBS; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxA; PFHxS; PFNA; PFNS; PFPeA; PFPeS;PFTeDA;PFTrDA; PFUnA
BRD056JSUR	KINGS MOUNTAIN RESERVOIR	9/9/21	10	4	24	2.2-2.8	PFHxA PFOA PFOS PFPeA	2.8 2.6 2.2 2.4	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA;PFBS; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxA; PFHxS; PFNA; PFNS; PFOA;PFOS; PFPeA; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD189CSUR	LAKE TILLERY	9/14/21	19.5	6	22	2.2-4.3	PFBA PFBS PFHxA PFOA PFOS PFPeA	2.4 2.2 4.3 2.5 4 4.1	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxS; PFNA; PFNS; PFPeS;PFTeDA;PFTrDA; PFUnA

Site ID	Site Description	Date	PFAS Sum	Analytes Detected	Analytes Below PQL	Analyte Range (ng/L)	Analyte	Result (ng/l)	PFAS Compounds below PQL
YAD216GSUR	LAKE CONCORD	9/14/21	114	9	19	4.3-31.9	PFBA PFBS PFHpA PFHxA PFHxS PFOA PFOS PFPeA PFPeS	4.3 10.8 4.4 9.4 30.7 7.4 31.9 8.7 6.4	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFDA; PFDoA; PFDoS; PFDS; PFHpS; PFNA; PFNS;PFTeDA;PFTrDA; PFUnA
YADCCR01SUR	CODDLE CREEK RESERVOIR	9/14/21	2.8	1	27	-	PFOS	2.8	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA;PFBS; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxA; PFHxS; PFNA; PFNS; PFOA; PFPeA; PFPeS;PFTeDA;PFTrDA; PFUnA
YADLH01SUR	LAKE HAMPTON	9/15/21	9.1	3	25	2.3-4.1	PFBS PFHxA PFPeA	4.1 2.3 2.7	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxS; PFNA; PFNS; PFOA;PFOS; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD207CSUR	KANNAPOLIS LAKE	9/21/21	17.2	6	22	2.2-4.6	PFBS PFHxA PFHxS PFOA PFOS PFPeA	2.9 2.2 2.5 2.6 4.6 2.4	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFNA; PFNS; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD260BSUR	BLEWETT FALLS LAKE	9/22/21	20.9	6	22	2.5-4.6	PFBA	2.5	

Site ID	Site Description	Date	PFAS Sum	Analytes Detected	Analytes Below PQL	Analyte Range (ng/L)	Analyte	Result (ng/l)	PFAS Compounds below PQL
							PFBS	2.5	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS;PFHxS; PFNA; PFNS; PFPeS;PFTeDA;PFTrDA; PFUnA
							PFHxA	4.4	
							PFOA	2.7	
							PFOS	4.2	
							PFPeA	4.6	
YAD1780ASUR	TUCKERTOWN RESERVOIR	9/23/21	19.3	6	22	2.3-4.5	PFBA	2.4	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxS; PFNA; PFNS; PFPeS;PFTeDA;PFTrDA; PFUnA
							PFBS	2.5	
							PFHxA	4	
							PFOA	2.3	
							PFOS	3.6	
							PFPeA	4.5	
YAD178BSUR	BADIN LAKE	9/23/21	18.9	6	22	2.3-4.2	PFBA	2.3	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxS; PFNA; PFNS; PFPeS;PFTeDA;PFTrDA; PFUnA
							PFBS	2.4	
							PFHxA	4	
							PFOA	2.4	
							PFOS	3.6	
							PFPeA	4.2	
YAD265CSUR	ROCKINGHAM CITY	9/23/21	2.3	1	28	-	PFOS	2.3	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA;PFBS; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxA; PFHxS; PFNA; PFNS; PFOA; PFPeA; PFPeS;PFTeDA;PFTrDA; PFUnA

Site ID	Site Description	Date	PFAS Sum	Analytes Detected	Analytes Below PQL	Analyte Range (ng/L)	Analyte	Result (ng/l)	PFAS Compounds below PQL
YAD280ESUR	WATER LAKE	9/23/21	11	3	25	3.5-3.9	PFHxS PFOA PFOS	3.5 3.6 3.9	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA;PFBS; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFHxA; PFNA; PFNS; PFPeA; PFPeS;PFTeDA;PFTrDA; PFUnA
BRD056JSUR	KINGS MOUNTAIN RESERVOIR	9/28/21	9.5	4	24	2.2-2.6	PFHxA PFOA PFOS PFPeA	2.6 2.4 2.2 2.3	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFBA;PFBS; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS;PFHxS; PFNA; PFNS; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD160BSUR	LAKE TOM-A-LEX	9/28/21	20.2	7	21	2.2-4.8	PFBA PFBS PFHxA PFHxS PFOA PFOS PFPeA	2.2 2.7 2.6 2.7 2.8 4.8 2.4	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFNA; PFNS;PFPeS;PFTeDA;PFTrDA; PFUnA
YAD1611ASUR	LAKE TOM-A-LEX	9/28/21	24	8	20	2.2-4.4	PFBA PFBS PFHpA PFHxA PFHxS PFOA PFOS PFPeA	2.2 2.4 4.4 2.6 2.6 2.8 4.4 2.6	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS; HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFDA; PFDoA; PFDoS; PFDS; PFHpS; PFNA; PFNS; PFPeS;PFTeDA;PFTrDA; PFUnA
YAD236SUR	LAKE STEWART	9/29/21	36.4	7	21	2.1-7.3	PFBA PFBS	5.1 7.3	4:2 FTS; 6:2 FTS;8:2 FTS; 9cl-PF3ONS; 11cl-PF3ONS;

Site ID	Site Description	Date	PFAS Sum	Analytes Detected	Analytes Below PQL	Analyte Range (ng/L)	Analyte	Result (ng/l)	PFAS Compounds below PQL
							PFHxA	5.2	HPFO-DA; NaDONA;N-EtFOSAA; N-MeFOSAA; PFDA; PFDoA; PFDoS; PFDS; PFHpA; PFHpS; PFNA; PFNS; PFPeS;PFTeDA;PFTrDA; PFUnA
							PFHxS	2.1	
							PFOA	6	
							PFOS	5.4	
							PFPeA	5.3	