Upper Cape Fear River Basin Association (UCFRBA)

UCFRBA 2020 Annual Report

Prepared for NC Division of Water Resources

Submitted: April 2021

Submitted by:

Cameron Colvin
Water Resources Planner
Piedmont Triad Regional Council
1398 Carrollton Crossing Dr.
Kernersville, NC 27284

Maya Cough-Schulze
Water Resources Planner
Triangle J Council of Governments
4307 Emperor Blvd, Suite 110
Durham, NC 27703

UCFRBA 2020 Annual Report

Table of Contents

Background

The Upper Cape Fear River Basin Association (UCFRBA) has been monitoring the waters of the Cape Fear River basin from its headwaters to the confluence of the Haw and Deep Rivers for the past twenty-one years. This non-profit organization was established in February 2000, as part of the NC Monitoring Coalition Program, to provide more effective and efficient means to monitor water quality throughout the watershed. The NC Monitoring Coalition Program allows individual wastewater dischargers to collectively fund and implement an instream monitoring program in exchange for a waiver of the ambient monitoring requirements in their individual National Pollutant Discharge Elimination System (NPDES) permits. The UCFRBA is currently comprised of 18 local governments and private industries that rely upon the river for wastewater discharge and/or water supply. It was the last basin association to be formed in the Cape Fear River Basin, following the Lower and Middle Basin programs which were established in 1996 and 1998 respectively.

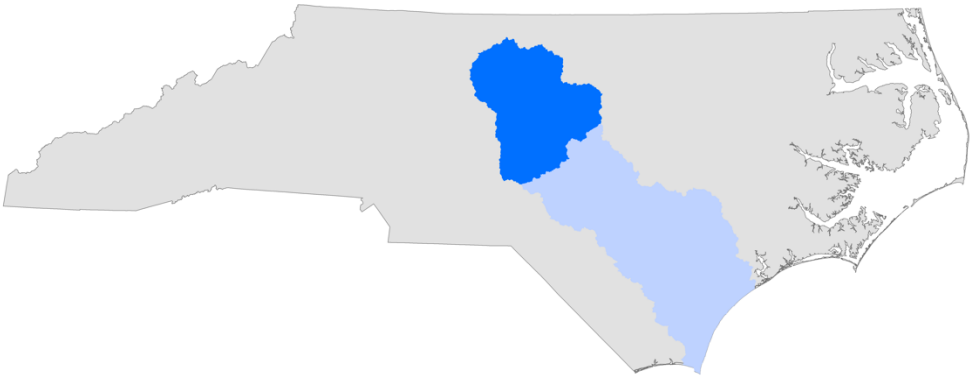


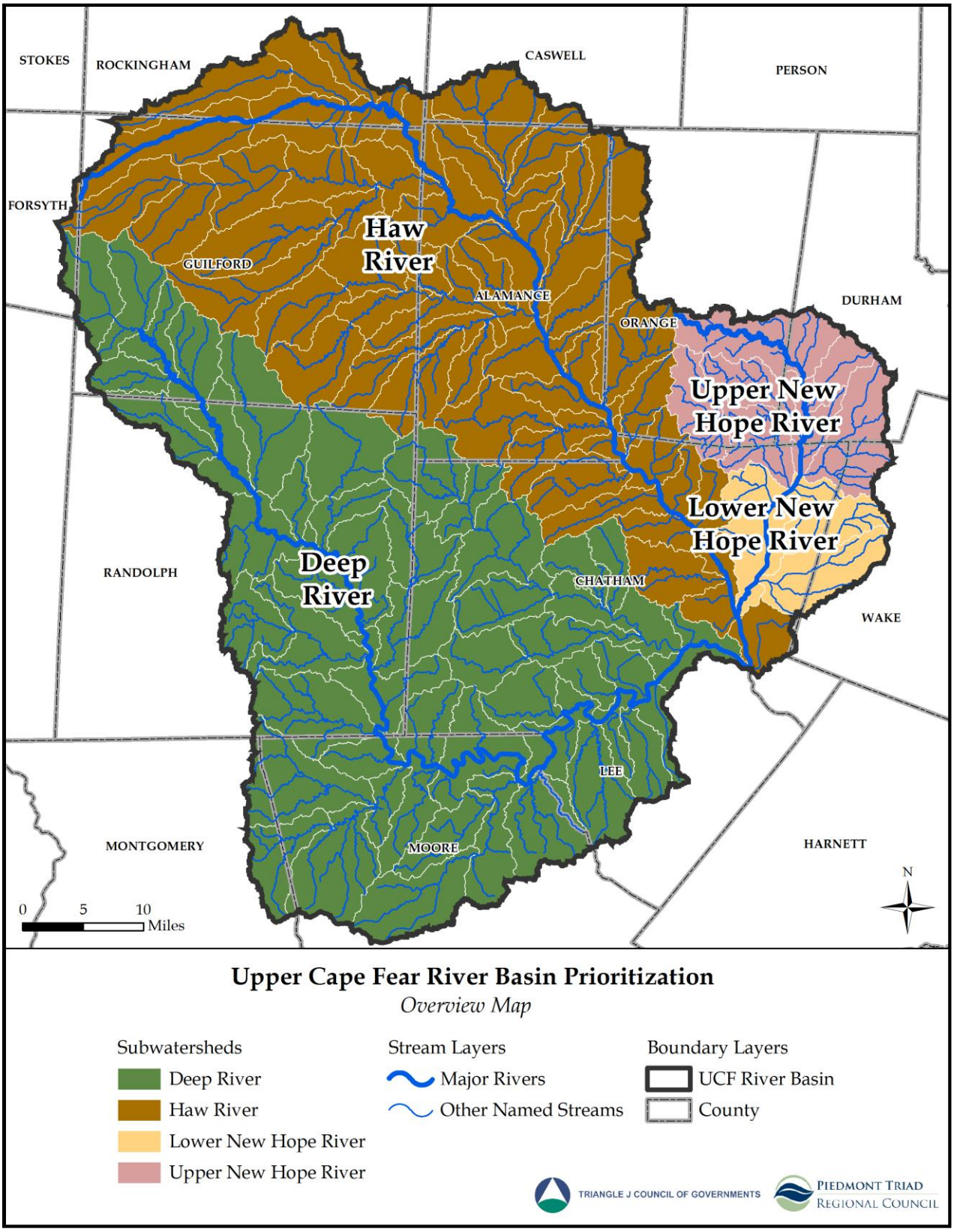
Figure 1: Upper Cape Fear River Basin

The UCFRBA maintains a robust monitoring network of forty (40) monitoring stations throughout the Upper Cape Fear River Basin, which are sampled on a monthly and bi-monthly basis. Monitoring locations are coordinated with the State's existing ambient and biological monitoring networks, to provide a more comprehensive picture of watershed conditions without duplicating efforts. The UCFRBA has a Memorandum of Agreement (MOA) with the North Carolina Division of Water Resources (NCDWR) binding its members to participate in the monitoring program, which began in April 2000. The Association has since renewed its MOA with NCDWR every five years. This agreement was last renewed in Spring 2020 for 2020-2025.

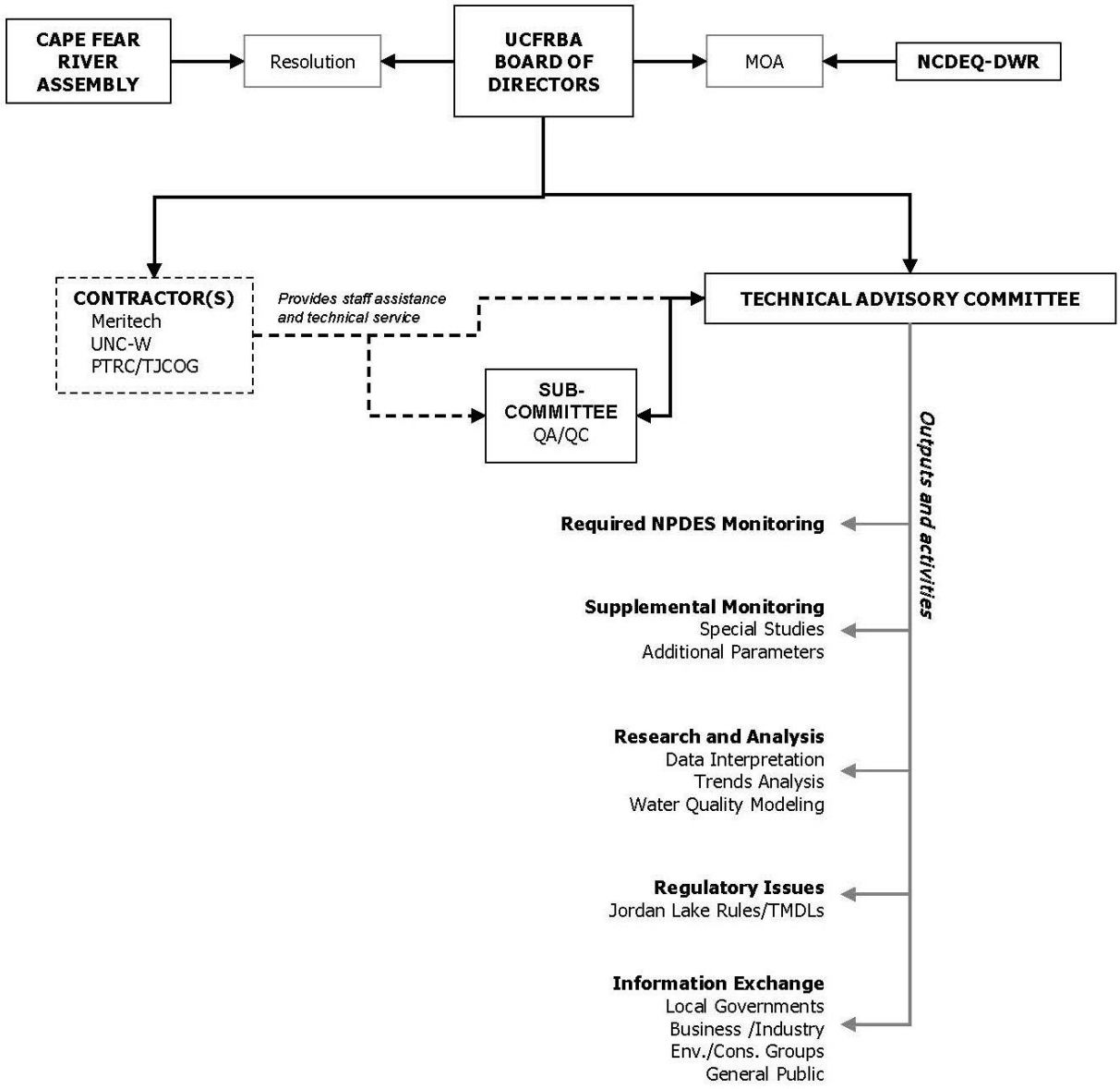
In addition to its monitoring program, the UCFRBA provides an ongoing forum for interested parties to work together on water resource planning, management and protection issues of mutual concern in the Jordan Lake watershed (including the Haw River and New Hope Creek subwatersheds), the Deep River watershed, and the Rocky River watershed in the uppermost part of the Cape Fear River Basin. The UCFRBA has undertaken several specials studies in the past to provide supplemental data and better understand the forces driving water quality in the Upper Cape Fear River. Previous studies have included working with the US Geological Society (USGS) to study sediment and nutrients within the watershed, a four-month pilot study of dissolved metals, and additional sampling to support the development of a watershed model for the Deep River and Rocky River watersheds. Members were also active in the development of the Jordan Lake TMDL and are currently participating in the Jordan Lake One Water initiative.

This report has been prepared to provide interested parties with general information regarding the UCFRBA's monitoring and research activities during calendar year 2020. The report describes the Association's organizational structure, current and future monitoring efforts, and provides a summary of monitoring data collected over the past year.

Figure 2: Upper Cape Fear Overview Map



Organizational Structure



Board of Directors

The UCFRBA is governed by a Board of Directors, which is made up of one representative from each corporate (dues paying) member. This includes 18 local governments and industries that use the Upper Cape Fear River Basin for water supply or treating and discharging wastewater. Each corporate member is afforded one vote and has the authority to appoint one Director and one Alternate Director to the Board of Directors. The Town of Cary is a special exception, as they have no permit responsibilities within the Basin, but do have an interest in water supply quality and are therefore accorded voting rights with lower dues. The Board of Directors has ultimate responsibility for all financial actions, membership, election of officers, and decisions affecting the Association and typically meets on a bi-annual basis.

Listed below are the organizations that make up the Board of Directors, their designated representatives, and NPDES permit numbers. The full board list with addresses and contact information can be found in APPENDIX B: UCFRBA Board of Directors.

Corporate Members	Discharger	Public Water System	Representatives		NPDES Permit Number(s)
Arclin	Yes	No	Brian Reddy	Brad Crawford	NC0000892
Asheboro	Yes	Yes	Michael Rhoney	John Ogburn II	NC0026123
Burlington	Yes	Yes	Bob Patterson	Eric Davis	NC0023868, NC0023876
Cary	No	Yes	Maria Vanderloop	Sarah Braman	None
City of Durham	Yes	Yes	Charlie Cocker	Vicki Westbrook	NC0047597
Graham	Yes	Yes	Tonya Mann	Cris Routh	NC0021211
Greensboro	Yes	Yes	Martie Groome	Elijah Williams	NC0047384
High Point	Yes	Yes	Terry Houk	Derrick Boone	NC0024210
Mebane	Yes	Yes	Dennis Hodge	David Cheek	NC0021474
OWASA	Yes	Yes	Jennifer Hunter	Monica Dodson	NC0025241
Pilgrim's Pride	Yes	No	Tina Pedley	Jamal Mohammed	NC0072575, NCG590000
Pittsboro	Yes	Yes	Jim Nass	Chris Kennedy	NC0020354
Ramseur	Yes	Yes	Terry Lewallen	Vicki Caudle	NC0026565
Randleman	Yes	Yes	William Johnson	Michael Glass	NC0025445
Reidsville	Yes	Yes	Chuck Smith	Scott Bryan	NC0024881
Sanford	Yes	Yes	Victor Czar	Scott Siletzky	NC0024147
Siler City	Yes	Yes	Roy Lynch	Chris McCorquodale	NC0026441
Star	Yes	Yes	Wesley Brown	Mary O'Brien	NC0058548

Officers

The Officers of the Board of Directors consist of a Chair, a Vice Chair, and a Secretary/Treasurer. Officers are elected biannually by the Board of Directors and each officer serves a term of two (2) years. The most recent officer elections occurred in 2020.

Officers of the Board of Directors

Chairman:	*Charles Cocker, City of Durham*
Vice-Chairman:	*Elijah Williams, City of Greensboro*

Technical Advisory Committee

The Technical Advisory Committee (TAC) is responsible for providing the Board of Directors with assistance and recommendations concerning the development of proposed annual work programs, specific project plans, and alternative funding sources and strategies. Technical Committee members represent a range of stakeholders with expertise in water quality research and management issues and they serve on a volunteer basis. The Technical Committee is open to participation to anyone that would like to attend. A complete list of current TAC committee members is provided in Appendix C.

Technical Advisory Committee (TAC) Chair:	*Alicia Goots, City of Greensboro*
TAC Vice-Chair:	*VACANT*

QA/QC Subcommittee

The Quality Assurance/Quality Control Subcommittee reviews monthly monitoring data to ensure its accuracy and reliability. The following are members of the QA/QC Subcommittee:

Dawn Molnar, QA/QC Chair	*City of High Point*
Elaine Sellars	*City of High Point*
Alicia Goots	*City of Greensboro*
Martie Groome	*City of Greensboro*
Amanda Hancock	*Meritech, Inc.*
Cameron Colvin, Staff Support	*PTRC*

Administrative Staff

The UCFRBA contracts with the Triangle J Council of Governments (TJCOG) and Piedmont Triad Regional Council (PTRC) for administrative, financial, and technical services. These two organizations jointly manage the association and provide ongoing staff support.

Staff Contacts

Cameron Colvin	Maya Cough-Schulze
Piedmont Triad Regional Council	Triangle J Council of Governments
ccolvin@ptrc.org	mcough-schulze@tjcog.org
(336) 904-0300	(919) 558-9389

Official Website

The UCFRBA maintains a dedicated website at https://www.ptrc.org/ucfrba. This website provides up-to-date information about the UCFRBA and its monitoring program, including station locations, monitoring schedules, organizational documents, and meeting notices and materials.

Summary of Monitoring Program

The UCFRBA renewed its MOA with NCDWR in May 2020 in order to comply with the federal NPDES program. The current monitoring program required by the MOA for the Upper Cape Fear includes forty (40) stations, which were established in cooperation with the NCDWR to monitor water quality near point source discharges. Stations are dispersed throughout the Upper Cape Fear River Basin, covering the main stems of the Haw and Deep Rivers, as well as most major tributaries. In 2019, Station B3040000 on New Hope Creek at SR 1107 was relocated due to safety concerns. The station was assigned a new station number (B3039000) and is now located above SR 1107 at a concrete impoundment. The UCFRBA also re-added one station (B3300000) in Durham County along Northeast Creek at SR1102 in March 2020 at the request of the City of Durham.

Water quality samples are collected and analyzed on a monthly basis for a range of parameters including temperature, dissolved oxygen, conductivity, pH, fecal coliform, turbidity, total suspended solids, ammonium, nitrite-nitrate, TKN, and total phosphorus. Field parameters (temperature, dissolved oxygen, conductivity, and pH) are sampled bi-monthly during the growing season (May – September) at thirty-two (32) of the UCFRBA's forty (40) monitoring stations. Through 2007, the UCFRBA also monitored metals quarterly and low-level mercury at seven (7) sites. However, in April 2007, NCDWR released a memo suspending the metals monitoring requirement in the MOA for all monitoring coalitions while they re-evaluate new approaches regarding metals data and the use of water quality standards and criteria for metals. As a result, there is no metals data to report for this year. A complete list of UCFRBA monitoring stations and their monitoring frequencies have been provided in Table 1 .

From January 2019 through December 2020, the UCFRBA collected additional samples at stations B4800000 and B5950000 to support the development of a watershed model for the Upper Cape Fear watershed (Deep River and Rocky River watersheds) and a water quality and hydrodynamic model for the Middle Cape Fear watershed (from confluence of the Haw River and Deep River down to Lock and Dam #1). Additional sampling included five (5) new parameters (chlorophyll *a*, orthophosphates, total organic carbon, BOD5, and BOD20) and nutrients, turbidity, and suspended residue samples were increased to twice monthly during the growing season.

Certified Lab

Laboratory services are currently provided by Meritech Inc., based in Reidsville, NC. Meritech is certified by NCDWR to perform environmental analysis and report monitoring data to DEQ for NPDES compliance and has provided these services for the UCFRBA since 2005. SimaLabs, Inc., was the UCFRBA's laboratory for conducting instream monitoring and analyses until August 2004.

Data Access

All monitoring data collected by the UCFRBA is reviewed by the QA/QC subcommittee and submitted to NCDWR on a quarterly basis. Data can be accessed from two online databases – the U.S. EPA's Water Quality Portal (WQP) Database and the Cape Fear River Water Quality Database, which is a joint effort between the Upper, Middle, and Lower Cape Fear programs. This database is maintained by the University of UNC-Wilmington and provides additional analysis and reporting capabilities. Data is typically compiled and uploaded to both databases on an annual basis.

Monitoring Stations

Table 1: UCFRBA Water Quality Monitoring Stations

DWQ Station Number	Location	Station Information	Lattitude (dd.dddd)	Longitude (dd.dddd)	County	Stream Class	Stream Index	Sub-Basin	[1]Field Parameters	Fecal Coliform	Turbidity	TSS	[2]Nutrients	[3]Metals
B0050000	Haw Riv at US 29 Bus nr Benaja	ups Reidsville WWTP	36.2652	-79.6523	ROCKINGHAM	C, NSW	16-(1)	03-06-01	M + 2SM	M	M	M	M	
B0070010	Troublesome Crk at US 29 Bus nr Reidsville	major tributary, nps inputs	36.2768	-79.6499	ROCKINGHAM	C, NSW	16-6-(3)	03-06-01	M	M	M	M	M	
B0170000	Haw Riv at SR 2620 High Rock Rd nr Williamsburg	below Reidsville WWTP	36.2514	-79.5647	ROCKINGHAM	C, NSW	16-(1)	03-06-01	M + 2SM	M	M	M	M	
B0400000	Reedy Fork at SR 2719 High Rock Rd nr Monticello	model verification	36.1778	-79.6177	GUILFORD	C, NSW	16-11-(9)	03-06-02	M	M	M	M	M	
B0480050	N Buffalo Crk at N Buffalo Crk WWTP Influent Conduit Pier at Greensboro	ups N. Buffalo WWTP	36.1074	-79.7502	GUILFORD	C, NSW	16-11-14-1	03-06-02	M +2SM	M	M	M	M	
B0540050[4]	N Buffalo Crk at SR 2770 Huffine Mill Rd nr McLeansville	dns N. Buffalo WWTP	36.1299	-79.6626	GUILFORD	C, NSW	16-11-14-1	03-06-02	M +2SM	M	M	M	M	
B0670000	S Buffalo Crk at SR 3000 McConnell Rd nr Greensboro	USGS gage, ups TZ Osborne WWTP	36.0598	-79.7256	GUILFORD	C, NSW	16-11-14-2	03-06-02	M +2SM	M	M	M	M	
B1020000	Haw Riv at SR 1700 Lower Hopedale Rd at Hopedale	ups Burlington East WWTP	36.1531	-79.4894	ALAMANCE	C, NSW	16-(1)	03-06-02	M +2SM	M	M	M	M	
B1200000	Haw Riv at NC 54 nr Graham	btw Burlington East and Graham	36.0481	-79.3667	ALAMANCE	C, NSW	16-(1)	03-06-02	M +2SM	M	M	M	M	
B1350000	Moadams Crk at Corrigdor Rd nr Mebane	ups Mebane WWTP	36.0885	-79.2844	ALAMANCE	C, NSW	16-18-7	03-06-02	M +2SM	M	M	M	M	
B1380000	Moadams Crk at SR 1940 Gibson Rd nr Florence Town	dns Mebane WWTP	36.0891	-79.3074	ALAMANCE	C, NSW	16-18-7	03-06-02	M +2SM	M	M	M	M	
B1440000	Haw Riv at SR 2158 Swepsonville Rd nr Swepsonville	dns Graham WWTP	36.0256	-79.3682	ALAMANCE	C, NSW	16-(1)	03-06-02	M +2SM	M	M	M	M	
B1940000	Big Alamance Crk at NC 87 nr Swepsonville	ups Burlington S. WWTP	36.0242	-79.3943	ALAMANCE	C, NSW	16-19-(4.5)	03-06-02	M +2SM	M	M	M	M	
B2000000	Haw Riv at SR 1005 nr Saxpahaw	Rural area, dns Cane Creek	35.8953	-79.2585	ALAMANCE	C, NSW	16-(1)	03-06-04	M	M	M	M	M	
B2100000	Haw Riv at SR 1713 nr Bynum	USGS Gage, ups Jordan L., DWR ambient stn	35.7716	-79.1449	CHATHAM	WS-IV, NSW	16-(28.5)	03-06-04	M	M	M	M	M	
B3020000	New Hope Crk at NC 54 nr Durham	ups S. Durham WRF, below waterfowl imp.	35.9167	-78.9704	DURHAM	WS-IV, NSW	16-41-1-(11.5)	03-06-05	M +2SM	M	M	M	M	
B3025000	Third Fork Crk at NC 54 nr Durham	Urban runoff	35.9187	-78.9548	DURHAM	WS-IV, NSW	16-41-1-12-(2)	03-06-05	M	M	M	M	M	
B3039000	New Hope Crk above SR 1107 at concrete impoundment	DWR ambient stn, USGS gage, Jordan Lake TMDL	35.8858	-78.9653	DURHAM	WS-IV, NSW	16-41-1-(11.5)	03-06-05	M +2SM	M	M	M	M	
B3300000	Northeast Crk at SR 1102 (Sedwick Rd) nr RTP	ups Durham Co. RTP WWTP	35.8870	-78.8994	DURHAM	WS-IV, NSW	16-41-1-17-(0.7)	03-06-05	M +2SM	M	M	M	M	
B3670000	Northeast Crk at SR 1731 O Kelly Church Road nr Durham	dns Durham Co. RTP WWTP, Jordan Lake TMDL	35.8555	-78.9397	CHATHAM	WS-IV, NSW	16-41-1-17-(0.7)	03-06-05	M +2SM	M	M	M	M	
B3899180	Morgan Crk at Mason Farm WWTP entrance at Chapel Hill	ups OWASA	35.8987	-79.0263	ORANGE	WS-IV, NSW	16-41-2-(5.5)	03-06-06	M +2SM	M	M	M	M	
B3900000	Morgan Crk at SR 1726 Old Farrington Rd nr Farrington	dns OWASA, DWR ambient stn	35.8612	-79.0100	CHATHAM	WS-IV, NSW, CA	16-41-2-(5.5)	03-06-06	M +2SM	M	M	M	M	
B4080000	Haw Riv at SR 1011 Old US 1 nr Haywood	dns Honeywell, ups Neste Resins	35.6164	-79.0569	CHATHAM	WS-IV	16-42	03-06-04	M +2SM	M	M	M	M	

DWQ Station Number	Location	Station Information	Lattitude (dd.dddd)	Longitude (dd.dddd)	County	Stream Class	Stream Index	Sub-Basin	[1]Field Parameters	Fecal Coliform	Turbidity	TSS	[2]Nutrients	[3]Metals
B4350000	Deep Riv at SR 1113 Kivett Dr nr Hayworth Spring	ups Richland Crk	35.9594	-79.9061	GUILFORD	WS-IV, CA*	17-(4)	03-06-08	M +2SM	M	M	M	M	
B4380000	Richland Crk at SR 1154 Kersey Valley Rd nr High point	ups High Point Eastside WWTP, fecal coliform TMDL	35.9410	-79.9322	GUILFORD	WS-IV, CA*	17-7-(4)	03-06-08	M +2SM	M	M	M	M	
B4621000	Muddy Crk at SR 1917 Suits Rd nr Glenola	fecal coliform TMDL	35.8836	-79.8950	RANDOLPH	WS-IV, *	17-9-(1)	03-06-08	M	M	M	M	M	
B4770500	Deep Riv at 220 Bus Main St at Randleman	ups Randleman WWTP ups Hasketts Crk	35.8233	-79.8033	RANDOLPH	C	17-(10.5)	03-06-08	M +2SM	M	M	M	M	
B4800000[5]	Deep Riv at SR 2122/2128 Worthville Rd at Worthville	dns Randleman WWTP dns Worthville dam	35.8021	-79.7771	RANDOLPH	C	17-(10.5)	03-06-09	M +2SM	M	M	M	M	
B4870000	Haskett Crk at Asheboro WWTP Bridge nr Asheboro	ups Asheboro WWTP	35.7649	-79.7864	RANDOLPH	C	17-12	03-06-09	M	M	M	M	M	
B4920000	Deep Riv at SR 2261 Old Liberty Rd nr Central Falls	dns Asheboro WWTP, below Hasketts Crk	35.7642	-79.7734	RANDOLPH	C	17-(10.5)	03-06-09	M +2SM	M	M	M	M	
B5070000	Deep Riv at SR 2615 Brooklyn Ave at Ramseur	ups Ramseur WWTP	35.7302	-79.6558	RANDOLPH	C	17-(10.5)	03-06-09	M +2SM	M	M	M	M	
B5100000	Deep Riv at SR 2628 Hinshaw Town Rd nr Parks Crossroads	dns Ramseur WWTP	35.6724	-79.6274	RANDOLPH	C	17-(10.5)	03-06-09	M +2SM	M	M	M	M	
B5390800	Cotton Crk at SR 1372 Auman Rd nr Star	dns Star WWTP	35.3782	-79.7551	MONTGOMERY	WS-III	17-26-5-3	03-06-10	M +2SM	M	M	M	M	
B5685000	Deep Riv at Deep River Park Bridge nr Cumnock	ups Golden Poultry	35.5704	-79.2411	CHATHAM	C	17-(38.7)	03-06-11	M +2SM	M	M	M	M	
B5820000	Deep Riv at US 15 and 501 nr Sanford	dns Sanford WWTP	35.5704	-79.1942	LEE	C	17-(38.7)	03-06-11	M +2SM	M	M	M	M	
B5950000[5]	Rocky Riv at US 64 nr Siler City	dns reservoir, ups Siler City WWTP	35.7351	-79.4233	CHATHAM	C	17-(43)-8	03-06-12	M +2SM	M	M	M	M	
B5980000	Rocky Riv at SR 2170 Rives Chapel Rd nr Siler City	dns Siler City WWTP	35.6985	-79.3756	CHATHAM	C	17-(43)-8	03-06-12	M +2SM	M	M	M	M	
B6040300	Deep Riv at SR 1011 Old US 1 nr Moncure	ups of confluence with Haw River, DWR ambient stn	35.6176	-79.0912	CHATHAM	WS-IV	17-(43.5)	03-06-11	M	M	M	M	M	
B5890000	Loves Creek at Waste Treatment Plant Rd at Siler City	us Siler City WWTP	35.7298	-79.4289	CHATHAM	C	17-(43)-10	03-06-12	M +2SM	M	M	M	M	
B5920000	Loves Creek at Progress Blvd at Siler City	ds Siler City WWTP	35.7322	-79.4246	CHATHAM	C	17-(43)-10	03-06-12	M +2SM	M	M	M	M	

[1] Field Parameters include Temperature, Dissolved Oxygen, pH, Conductivity

[2] Nutrients include Ammonia as N, Nitrate/Nitrite as N, Total Kjeldahl Nitrogen as N, and Total Phosphorus as P

[3] No requirements for metals monitoring are included in this MOA, as the DWR is currently in the process of reviewing metals water quality assessment techniques, evaluation criteria and relevant standards. However, the DWR may conclude the review within the life cycle of this MOA. At such time, or when the DWQ Director mandates, the UCFRBA is expected to resume monitoring at a level of effort similar to that in the 2005-2010 MOA. Within 60 days of the release of relevant documentation, the UCFRBA will finalize an amendment to the MOA, which includes metals monitoring.

[4] The City of Greensboro recently decommissioned its North Buffalo Creek WWTP at this location.

[5]The UCFRBA is conducting additional monitoring at stations B4800000 and B5950000 from January 2019 – December 2020. New parameters include chlorophyll *a*, orthophosphates, total organic carbon, BOD5, and BOD20. In addition, nutrients, turbidity, and suspended residue are being sample twice monthly during the summer (May-September).

M=Monthly M+2SM=Monthly with Twice Monthly Summer Sampling May, June, July, August, and September. Samples are to be collected at least 10-days apart except when extenuating circumstances arise.

Q=Quarterly March, June, September, and December ups=upstream dns=downstream

Sampling Methods

The following are the sampling methods used by Meritech for UCFRBA analysis:

pH ---------- SM 4500 HB
Temperature---------- SM 2550 B
Conductivity---------- EPA 120.1
DO ---------- SM 4500 O G
Fecal Coliform---------- SM 9222 D
TSS ---------- SM 2540 D
Turbidity ---------- EPA 180.1
Ammonia ---------- EPA 350.1
TKN---------- SM 4500 NH3B
NO2/NO3---------- EPA 353.2
Ptot ---------- EPA 200.7
Metals (except Hg)---------- EPA 200.7 (discontinued 08/2007)
Mercury ---------- EPA 1631 (discontinued 08/2007)

A complete list of sampling procedures has been included in APPENDIX D: UCFRBA Sampling Procedures.

Quality Assurance/Quality Control Issues

Meritech Labs provides all data collection and lab analysis services for the UCFRBA. All known QA/QC issues were denoted in the remarks section of the monthly spreadsheets that are submitted to NCDWR on a quarterly basis. The UCFRBA's QA/QC subcommittee also met quarterly to review and approve monthly samples. Additional QA/QC issues, such as transcription or calculation errors, identified by the QA/QC subcommittee were summarized in their quarterly reports (see Appendix E) and corrected before datasheets were submitted to NCDWR. Despite the unpresented challenges that this year presented as a result of the COVID-19 pandemic, all samples in 2020 were collected and analyzed as required by the MOA with no disruptions. We would like to commend Meritech for their outstanding efforts during these difficult times.

2020 UCFRBA Issues

The following are topics that occupied significant UCFRBA staff and members' time in 2020.

Additional Monitoring to Support Modeling & Assessment Branch

In January 2019, the UCFRBA began collecting additional samples at stations B4800000 and B5950000 to support the NCDWR Modeling and Assessment Branch in developing a watershed model for the Upper Cape Fear watershed (Deep River and Rocky River watersheds) and a water quality and hydrodynamic model for the Middle Cape Fear watershed (from confluence of the Haw River and Deep River down to Lock and Dam #1). Five new parameters were monitored at these two sites, including chlorophyll *a*, orthophosphates, total organic carbon, and short and long-term biochemical oxygen demand. Turbidity, suspended residue, and nutrients are also now being sampled bi-monthly during the growing season (May-September). This voluntary additional sampling continued through December 2020, excluding BOD5 samples which were discontinued after the first year, to help improve confidence in model predictions.

2020-2025 MOA Renewal

At the beginning of this year the UCFRBA dedicated a significant amount of time and resources to reevaluate and renegotiate its MOA between the NCDWR, UCFRBA, and UCFRBA members for 2020-2025. The UCFRBA worked with NCDWR to streamline components of the MOA and make it more clear and concise. During the MOA renewal process, the City of Durham requested that the UCFRBA re-add station B3300000 along Northeast Creek at SR 1102 to its monitoring network because of its value to their stormwater management department. Monitoring at this station began in March 2020.

Nutrients and Emerging Contaminants

This year the UCFRBA invited a range of guest speakers to share recent research findings regarding nutrients and emerging contaminants in the Cape Fear River Basin. Topics included the most recent Jordan Lake nutrient models, nutrient issues in the Rocky River, PFA concentrations in striped bass, and organizational overviews from the Cape Fear River Partnership and Sustainable Rivers.

Officer Elections

The UCFRBA held officer elections this year for the 2018-2020 term. Charlie Cocker (previously Board Vice-Chair) will be serving as the new Board chair, while Elijah Williams will be serving as the new Board Vice-Chair. Alicia Goots will continue serving as the TAC Chair. The UCFRBA is still seeking a TAC Vice-Chair.

Cape Fear Database Updates

The UCFRBA continued its partnership with the MCFRBA and LCFRP to maintain a centralized water quality database for the Cape Fear River Basin. The database was updated to a new platform in 2019 to improve functionality and is now accessible at the following web address: www.capefearwq.com.

APPENDIX A: UCFRBA Station Summaries

01/01/2020-12/31/2020 Summary Report

Station Id: Troublesome Crk at US 29 Bus nr Reidsville

B0070010/UCFRBA_01 **Stream Class:** C NSW **Sub-Basin:** CPF01

County: Rockingham **Latitude:** 36.2768 **Longitude:** -79.6499 **HUC:** 3030002

Parameter	Count	< DT	WQS	# Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature (C)	12	0	32	0	7.8	29.5	18.44	19.9	7.16
pH (su)	12	0	6~9	0	6.7	7.2	6.79	6.75	0.15
Diss. Oxy. (mg/L)	12	0	4	0	5.1	11.3	8.03	8.85	2.11
Conductivity (umhos/cm)	12	0	NA	0	49	68	58.75	59	5.2
Fecal Coliform (col/100ml)	12	0	400	2	2	3800	51.26*	55	1038
Lab Turbidity (NTU)	12	0	50	1	4.6	59	16.9	11.45	15.51
TSS (mg/L)	12	1	NA	0	1.25	19	7.52	6	5.31
Chlorophyll-a (ug/L)	0								
NH3-N (mg/L)	12	5	NA	0	0.01	0.11	0.05	0.06	0.04
TKN-N (mg/L)	12	0	NA	0	0.35	0.98	0.62	0.68	0.18
NO2-NO3 (mg/L)	12	0	NA	0	0.07	1	0.24	0.22	0.24
T. Phos. (mg/L)	12	0	NA	0	0.02	0.08	0.04	0.04	0.02
Cadmium (ug/L)	0								
Chromium (ug/L)	0								
Copper (ug/L)	0								
Nickel (ug/L)	0								
Lead (ug/L)	0								
Zinc (ug/L)	0								
Aluminum (ug/L)	0								
Iron (ug/L)	0								
Manganese (ug/L)	0								
Mercury (ug/L)	0								
Arsenic (ug/L)	0								
Hardness (mg/L)	0								

(* Fecal Coliform Geomean)

(** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.
Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.)

(*** Standard Deviation range of values is also affected by climate and storm events and etc.)

01/01/2020-12/31/2020 Summary Report

Station Id:	Haw Riv at US 29 Bus nr Benaja								
B0050000/UCFRBA_02		**Stream Class:**	C NSW			**Sub-Basin:**	CPF01		
County:	Rockingham	**Latitude:**	36.2652	**Longitude:**	-79.6523	**HUC:**	3030002		

Parameter	**Count**	**< DT**	**WQS**	**# Exceed**	**MIN**	**MAX**	**AVG**	**Median**	**Std Dev*** **
Temperature (C)	17	0	32	0	5.3	27.5	18.22	19.9	6.83
pH (su)	17	0	6~9	0	6.4	7.2	6.83	6.9	0.21
Diss. Oxy. (mg/L)	17	0	4	0	4.8	12.2	7.83	8.4	2.27
Conductivity (umhos/cm)	17	0	NA	0	48	112	91.76	96	15.59
Fecal Coliform (col/100ml)	17	0	400	**2**	0	4800	0.00*	50	1196.77
Lab Turbidity (NTU)	17	0	50	**1**	0	74.9	13.66	13.1	16.81
TSS (mg/L)	17	0	NA	0	0	11	4.41	5	3.34
Chlorophyll-a (ug/L)	0								
NH3-N (mg/L)	17	**11**	NA	0	0	0.08	0.01	0.01	0.02
TKN-N (mg/L)	17	0	NA	0	0	4.59	0.64	0.5	1.04
NO2-NO3 (mg/L)	17	0	NA	0	0	0.3	0.14	0.15	0.11
T. Phos. (mg/L)	17	0	NA	0	0	0.13	0.04	0.04	0.03
Cadmium (ug/L)	0								
Chromium (ug/L)	0								
Copper (ug/L)	0								
Nickel (ug/L)	0								
Lead (ug/L)	0								
Zinc (ug/L)	0								
Aluminum (ug/L)	0								
Iron (ug/L)	0								
Manganese (ug/L)	0								
Mercury (ug/L)	0								
Arsenic (ug/L)	0								
Hardness (mg/L)	0								

(* Fecal Coliform Geomean)

(** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.
Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.)

(*** Standard Deviation range of values is also affected by climate and storm events and etc.)

01/01/2020-12/31/2020 Summary Report

Station Id:	Haw Riv at SR 2620 High Rock Rd nr Williamsburg								
B0170000/UCFRBA_03		**Stream Class:**	C NSW			**Sub-Basin:**	CPF01		
County:	Rockingham	**Latitude:**	36.2514	**Longitude:**	-79.5647	**HUC:**	3030002		

Parameter	**Count**	**< DT**	**WQS**	**# Exceed**	**MIN**	**MAX**	**AVG**	**Median**	**Std Dev*** **
Temperature (C)	17	0	32	0	5.7	26.5	18.86	20.5	6.33
pH (su)	17	0	6~9	0	6.5	7.3	6.94	7.1	0.28
Diss. Oxy. (mg/L)	17	0	4	0	5.8	12.3	8.09	7.3	1.93
Conductivity (umhos/cm)	17	0	NA	0	54	153	100.41	106	28.78
Fecal Coliform (col/100ml)	17	0	400	**4**	0	9000	0.00*	114	2334.68
Lab Turbidity (NTU)	17	0	50	**2**	0	72.6	19.72	12.3	22.07
TSS (mg/L)	17	0	NA	0	0	35	10.18	6	12.39
Chlorophyll-a (ug/L)	0								
NH3-N (mg/L)	17	**11**	NA	0	0	0.02	0.01	0.02	0.01
TKN-N (mg/L)	17	**1**	NA	0	0	0.89	0.41	0.47	0.33
NO2-NO3 (mg/L)	17	0	NA	0	0	0.97	0.28	0.35	0.25
T. Phos. (mg/L)	17	0	NA	0	0	0.2	0.07	0.07	0.06
Cadmium (ug/L)	0								
Chromium (ug/L)	0								
Copper (ug/L)	0								
Nickel (ug/L)	0								
Lead (ug/L)	0								
Zinc (ug/L)	0								
Aluminum (ug/L)	0								
Iron (ug/L)	0								
Manganese (ug/L)	0								
Mercury (ug/L)	0								
Arsenic (ug/L)	0								
Hardness (mg/L)	0								

(* Fecal Coliform Geomean)

(** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.
Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.)

(*** Standard Deviation range of values is also affected by climate and storm events and etc.)

01/01/2020-12/31/2020 Summary Report

Station Id:	Reedy Fork at SR 2719 High Rock Rd nr Monticello								
B0400000/UCFRBA_04		**Stream Class:**	C NSW			**Sub-Basin:**	CPF02		
County:	Guilford	**Latitude:**	36.1778	**Longitude:**	-79.6177	**HUC:**	3030002		

Parameter	**Count**	**< DT**	**WQS**	**# Exceed**	**MIN**	**MAX**	**AVG**	**Median**	**Std Dev*** **
Temperature (C)	12	0	32	0	7.4	27.4	17.13	18.65	6.79
pH (su)	12	0	6~9	0	6.6	7.4	7.03	7.05	0.22
Diss. Oxy. (mg/L)	12	0	4	0	6.9	11.8	8.93	9	1.55
Conductivity (umhos/cm)	12	0	NA	0	61	104	82.83	87.5	11.19
Fecal Coliform (col/100ml)	12	0	400	**2**	25	5400	164.36*	215	1462.08
Lab Turbidity (NTU)	12	0	50	**1**	3.2	52.7	16.49	10.2	15.41
TSS (mg/L)	12	**2**	NA	0	1.25	24	10.06	6	8.82
Chlorophyll-a (ug/L)	0								
NH3-N (mg/L)	12	**12**	NA	0	0.01	0.01	0.01	0.01	0
TKN-N (mg/L)	12	**2**	NA	0	0.1	0.89	0.41	0.49	0.22
NO2-NO3 (mg/L)	12	**1**	NA	0	0.01	0.24	0.14	0.14	0.08
T. Phos. (mg/L)	12	**4**	NA	0	0.01	0.1	0.04	0.04	0.03
Cadmium (ug/L)	0								
Chromium (ug/L)	0								
Copper (ug/L)	0								
Nickel (ug/L)	0								
Lead (ug/L)	0								
Zinc (ug/L)	0								
Aluminum (ug/L)	0								
Iron (ug/L)	0								
Manganese (ug/L)	0								
Mercury (ug/L)	0								
Arsenic (ug/L)	0								
Hardness (mg/L)	0								

(* Fecal Coliform Geomean)

(** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.
Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.)

(*** Standard Deviation range of values is also affected by climate and storm events and etc.)

01/01/2020-12/31/2020 Summary Report

Station Id: N Buffalo Crk at N Buffalo Crk WWTP Influent Conduit Pier at Greensboro

B0480050/UCFRBA_05 **Stream Class:** C NSW **Sub-Basin:** CPF02

County: Guilford **Latitude:** 36.1074 **Longitude:** -79.7502 **HUC:** 3030002

Parameter	Count	< DT	WQS	# Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature (C)	17	0	32	0	8.8	28	19.52	19.3	6.33
pH (su)	17	0	6~9	0	6.9	7.5	7.28	7.3	0.17
Diss. Oxy. (mg/L)	17	0	4	0	6.5	11.5	8.61	8.6	1.56
Conductivity (umhos/cm)	17	0	NA	0	107	287	197.65	227	61.3
Fecal Coliform (col/100ml)	17	0	400	7	0	6200	0.00*	300	1940.49
Lab Turbidity (NTU)	17	0	50	1	0	88.1	12.88	4.1	22.12
TSS (mg/L)	17	5	NA	0	0	90	10.73	1.3	22.55
Chlorophyll-a (ug/L)	0								
NH3-N (mg/L)	17	9	NA	0	0	0.13	0.02	0.01	0.03
TKN-N (mg/L)	17	1	NA	0	0	1.08	0.38	0.41	0.34
NO2-NO3 (mg/L)	17	0	NA	0	0	0.71	0.26	0.28	0.22
T. Phos. (mg/L)	17	0	NA	0	0	0.16	0.06	0.06	0.05
Cadmium (ug/L)	0								
Chromium (ug/L)	0								
Copper (ug/L)	0								
Nickel (ug/L)	0								
Lead (ug/L)	0								
Zinc (ug/L)	0								
Aluminum (ug/L)	0								
Iron (ug/L)	0								
Manganese (ug/L)	0								
Mercury (ug/L)	0								
Arsenic (ug/L)	0								
Hardness (mg/L)	0								

(* Fecal Coliform Geomean)

(** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.
Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.)

(*** Standard Deviation range of values is also affected by climate and storm events and etc.)

01/01/2020-12/31/2020 Summary Report

Station Id:	N Buffalo Crk at SR 2770 Huffine Mill Rd nr McLeansville				
B0540050/UCFRBA_06		**Stream Class:**	C NSW	**Sub-Basin:**	CPF02
County:	Guilford	**Latitude:**	36.1299 **Longitude:**	-79.6626	**HUC:** 3030002

Parameter	Count	< DT	WQS	# Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature (C)	17	0	32	0	6.7	28.2	18.65	18.2	7.11
pH (su)	17	0	6~9	0	6.6	8.3	7.28	7.3	0.35
Diss. Oxy. (mg/L)	17	0	4	0	6.6	13.6	9.01	8.4	1.93
Conductivity (umhos/cm)	17	0	NA	0	65	277	187.82	200	59.36
Fecal Coliform (col/100ml)	17	0	400	**5**	0	7800	0.00*	235	1999.07
Lab Turbidity (NTU)	17	0	50	0	0	44.1	9.95	5	13.45
TSS (mg/L)	17	**6**	NA	0	0	25	5.04	1.3	7.74
Chlorophyll-a (ug/L)	0								
NH3-N (mg/L)	17	**10**	NA	0	0	0.06	0.01	0.01	0.02
TKN-N (mg/L)	17	**1**	NA	0	0	0.9	0.38	0.4	0.32
NO2-NO3 (mg/L)	17	0	NA	0	0	0.77	0.28	0.3	0.25
T. Phos. (mg/L)	17	0	NA	0	0	0.18	0.06	0.06	0.05
Cadmium (ug/L)	0								
Chromium (ug/L)	0								
Copper (ug/L)	0								
Nickel (ug/L)	0								
Lead (ug/L)	0								
Zinc (ug/L)	0								
Aluminum (ug/L)	0								
Iron (ug/L)	0								
Manganese (ug/L)	0								
Mercury (ug/L)	0								
Arsenic (ug/L)	0								
Hardness (mg/L)	0								

(* Fecal Coliform Geomean)

(** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.
Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.)

(*** Standard Deviation range of values is also affected by climate and storm events and etc.)

01/01/2020-12/31/2020 Summary Report

Station Id:	S Buffalo Crk at SR 3000 McConnell Rd nr Greensboro								
B0670000/UCFRBA_07			**Stream Class:**	C NSW				**Sub-Basin:**	CPF02
County:	Guilford		**Latitude:**	36.0598	**Longitude:**	-79.7256		**HUC:**	3030002

Parameter	**Count**	**< DT**	**WQS**	**# Exceed**	**MIN**	**MAX**	**AVG**	**Median**	**Std Dev*** **
Temperature (C)	18	0	32	0	7	28.9	19.19	19.7	6.99
pH (su)	18	0	6~9	0	6.7	8.2	7.23	7.25	0.36
Diss. Oxy. (mg/L)	18	0	4	0	6.3	12	8.74	8.45	1.79
Conductivity (umhos/cm)	18	0	NA	0	77	290	195.06	232	70.5
Fecal Coliform (col/100ml)	18	0	400	**6**	0	11400	0.00*	205.5	3802.99
Lab Turbidity (NTU)	18	0	50	**3**	0	94.2	20.67	8.8	26.94
TSS (mg/L)	18	**1**	NA	0	0	70	13.24	4	19.35
Chlorophyll-a (ug/L)	0								
NH3-N (mg/L)	18	**10**	NA	0	0	0.03	0.01	0.01	0.01
TKN-N (mg/L)	18	0	NA	0	0	1.43	0.53	0.53	0.46
NO2-NO3 (mg/L)	18	**1**	NA	0	0	0.53	0.23	0.27	0.19
T. Phos. (mg/L)	18	0	NA	0	0	0.26	0.09	0.06	0.08
Cadmium (ug/L)	0								
Chromium (ug/L)	0								
Copper (ug/L)	0								
Nickel (ug/L)	0								
Lead (ug/L)	0								
Zinc (ug/L)	0								
Aluminum (ug/L)	0								
Iron (ug/L)	0								
Manganese (ug/L)	0								
Mercury (ug/L)	0								
Arsenic (ug/L)	0								
Hardness (mg/L)	0								

(* Fecal Coliform Geomean)

(** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.
Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.)

(*** Standard Deviation range of values is also affected by climate and storm events and etc.)

01/01/2020-12/31/2020 Summary Report

Station Id: Haw River at SR 1700 (Lower Hopedale Road) nr Hopedale

B1020000/UCFRBA_09A **Stream Class:** C NSW **Sub-Basin:** CPF02

County: Alamance **Latitude:** 36.1531 **Longitude:** -79.4894 **HUC:** 3030003

Parameter	Count	< DT	WQS	# Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature (C)	17	0	32	0	8.8	27.2	19.32	21.6	6.19
pH (su)	17	0	6~9	0	6.8	7.8	7.22	7.3	0.31
Diss. Oxy. (mg/L)	17	0	4	0	6.4	12.2	8.74	8.4	1.7
Conductivity (umhos/cm)	17	0	NA	0	70	275	151.35	141	65
Fecal Coliform (col/100ml)	17	0	400	5	0	12000	0.00*	250	3242.75
Lab Turbidity (NTU)	17	0	50	4	0	151	30.22	12.8	43.6
TSS (mg/L)	17	0	NA	0	0	158	21.35	5	37.79
Chlorophyll-a (ug/L)	0								
NH3-N (mg/L)	17	7	NA	0	0	0.8	0.07	0.01	0.19
TKN-N (mg/L)	17	0	NA	0	0	2.03	0.68	0.73	0.58
NO2-NO3 (mg/L)	17	0	NA	0	0	2.86	0.62	0.46	0.73
T. Phos. (mg/L)	17	0	NA	0	0	3.59	0.32	0.12	0.82
Cadmium (ug/L)	0								
Chromium (ug/L)	0								
Copper (ug/L)	0								
Nickel (ug/L)	0								
Lead (ug/L)	0								
Zinc (ug/L)	0								
Aluminum (ug/L)	0								
Iron (ug/L)	0								
Manganese (ug/L)	0								
Mercury (ug/L)	0								
Arsenic (ug/L)	0								
Hardness (mg/L)	0								

(* Fecal Coliform Geomean)

(** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.
Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.)

(*** Standard Deviation range of values is also affected by climate and storm events and etc.)

01/01/2020-12/31/2020 Summary Report

Station Id:	Moadams Crk at Corrigdor Rd ups of Discharge nr Mebane				
B1350000/UCFRBA_10		**Stream Class:**	C NSW	**Sub-Basin:**	CPF02
County:	Alamance	**Latitude:**	36.0885 **Longitude:** -79.2844	**HUC:**	3030002

Parameter	Count	< DT	WQS	# Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature (C)	17	0	32	0	9.4	25.5	18.71	19.1	5.55
pH (su)	17	0	6~9	0	6.6	7.2	6.97	7	0.15
Diss. Oxy. (mg/L)	17	0	4	0	6.8	10.4	8.38	8.6	1.15
Conductivity (umhos/cm)	17	0	NA	0	83	184	152.65	161	24.25
Fecal Coliform (col/100ml)	17	0	400	**6**	0	6800	0.00*	380	1913.52
Lab Turbidity (NTU)	17	0	50	**1**	0	57.4	15.95	13	15.39
TSS (mg/L)	17	0	NA	0	0	21	8.53	11	7.02
Chlorophyll-a (ug/L)	0								
NH3-N (mg/L)	17	**5**	NA	0	0	0.09	0.02	0.01	0.03
TKN-N (mg/L)	17	**1**	NA	0	0	1.32	0.4	0.47	0.36
NO2-NO3 (mg/L)	17	0	NA	0	0	0.97	0.39	0.45	0.3
T. Phos. (mg/L)	17	**2**	NA	0	0	0.09	0.03	0.01	0.02
Cadmium (ug/L)	0								
Chromium (ug/L)	0								
Copper (ug/L)	0								
Nickel (ug/L)	0								
Lead (ug/L)	0								
Zinc (ug/L)	0								
Aluminum (ug/L)	0								
Iron (ug/L)	0								
Manganese (ug/L)	0								
Mercury (ug/L)	0								
Arsenic (ug/L)	0								
Hardness (mg/L)	0								

(* Fecal Coliform Geomean)

(** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.
Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.)

(*** Standard Deviation range of values is also affected by climate and storm events and etc.)

01/01/2020-12/31/2020 Summary Report

Station Id:	Moadams Crk at SR 1940 Gibson Rd nr Florence Town				
B1380000/UCFRBA_11		**Stream Class:**	C NSW	**Sub-Basin:**	CPF02
County:	Alamance	**Latitude:**	36.0891	**Longitude:** -79.3074	**HUC:** 3030002

Parameter	Count	< DT	WQS	# Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature (C)	17	0	32	0	9.5	26.7	19.56	19.9	5.64
pH (su)	17	0	6~9	0	6.8	7.6	7.27	7.3	0.2
Diss. Oxy. (mg/L)	17	0	4	0	7.3	11.1	8.61	8.4	1.29
Conductivity (umhos/cm)	17	0	NA	0	119	533	349.82	382	115.03
Fecal Coliform (col/100ml)	17	0	400	**3**	0	5000	0.00*	86	1176.44
Lab Turbidity (NTU)	17	0	50	**1**	0	57.1	13.16	7.6	16.56
TSS (mg/L)	17	**4**	NA	0	0	19	4.77	3	5.56
Chlorophyll-a (ug/L)	0								
NH3-N (mg/L)	17	**4**	NA	0	0	0.68	0.12	0.08	0.18
TKN-N (mg/L)	17	0	NA	0	0	1.61	0.66	0.83	0.49
NO2-NO3 (mg/L)	17	0	NA	0	0	3	1.15	1.33	0.92
T. Phos. (mg/L)	17	0	NA	0	0	0.38	0.15	0.19	0.11
Cadmium (ug/L)	0								
Chromium (ug/L)	0								
Copper (ug/L)	0								
Nickel (ug/L)	0								
Lead (ug/L)	0								
Zinc (ug/L)	0								
Aluminum (ug/L)	0								
Iron (ug/L)	0								
Manganese (ug/L)	0								
Mercury (ug/L)	0								
Arsenic (ug/L)	0								
Hardness (mg/L)	0								

(* Fecal Coliform Geomean)

(** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.
Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.)

(*** Standard Deviation range of values is also affected by climate and storm events and etc.)

01/01/2020-12/31/2020 Summary Report

Station Id:	Haw Riv at SR 2158 Swepsonville Rd nr Swepsonville					
B1440000/UCFRBA_12		**Stream Class:**	C NSW		**Sub-Basin:**	CPF02
County:	Alamance	**Latitude:**	36.0256	**Longitude:** -79.3682	**HUC:**	3030002

Parameter	Count	< DT	WQS	# Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature (C)	17	0	32	0	8.3	28.7	19.62	21.7	6.55
pH (su)	17	0	6~9	0	6.8	7.7	7.24	7.3	0.27
Diss. Oxy. (mg/L)	17	0	4	0	6.7	12.3	8.74	8.8	1.65
Conductivity (umhos/cm)	17	0	NA	0	75	426	187.71	163	101.86
Fecal Coliform (col/100ml)	17	0	400	**6**	0	22000	0.00*	143	5774.49
Lab Turbidity (NTU)	17	0	50	**4**	0	111	26.39	14.2	34.55
TSS (mg/L)	17	**2**	NA	0	0	143	22.91	6	37.86
Chlorophyll-a (ug/L)	0								
NH3-N (mg/L)	17	**5**	NA	0	0	0.25	0.04	0.01	0.06
TKN-N (mg/L)	17	0	NA	0	0	2.33	0.71	0.76	0.62
NO2-NO3 (mg/L)	17	0	NA	0	0	4.58	0.82	0.51	1.12
T. Phos. (mg/L)	17	0	NA	0	0	0.85	0.16	0.11	0.2
Cadmium (ug/L)	0								
Chromium (ug/L)	0								
Copper (ug/L)	0								
Nickel (ug/L)	0								
Lead (ug/L)	0								
Zinc (ug/L)	0								
Aluminum (ug/L)	0								
Iron (ug/L)	0								
Manganese (ug/L)	0								
Mercury (ug/L)	0								
Arsenic (ug/L)	0								
Hardness (mg/L)	0								

(* Fecal Coliform Geomean)

(** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.
Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.)

(*** Standard Deviation range of values is also affected by climate and storm events and etc.)

01/01/2020-12/31/2020 Summary Report

Station Id: Haw Riv at NC 54 nr Graham

B1200000/UCFRBA_13 **Stream Class:** C NSW **Sub-Basin:** CPF02

County: Alamance **Latitude:** 36.0481 **Longitude:** -79.3667 **HUC:** 3030002

Parameter	Count	< DT	WQS	# Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature (C)	17	0	32	0	8.3	28.2	19.53	21.8	6.42
pH (su)	17	0	6~9	0	6.7	7.7	7.22	7.3	0.28
Diss. Oxy. (mg/L)	17	0	4	0	6.8	11.7	8.69	8.9	1.65
Conductivity (umhos/cm)	17	0	NA	0	75	400	177.18	158	96.88
Fecal Coliform (col/100ml)	17	0	400	**5**	0	12000	0.00*	119	3866.18
Lab Turbidity (NTU)	17	0	50	**4**	0	138	28.17	13.9	39.18
TSS (mg/L)	17	0	NA	0	0	127	20.65	7	33.38
Chlorophyll-a (ug/L)	0								
NH3-N (mg/L)	17	**7**	NA	0	0	0.11	0.02	0.01	0.03
TKN-N (mg/L)	17	0	NA	0	0	1.59	0.64	0.75	0.51
NO2-NO3 (mg/L)	17	0	NA	0	0	3.98	0.82	0.54	1.07
T. Phos. (mg/L)	17	0	NA	0	0	0.56	0.13	0.13	0.14
Cadmium (ug/L)	0								
Chromium (ug/L)	0								
Copper (ug/L)	0								
Nickel (ug/L)	0								
Lead (ug/L)	0								
Zinc (ug/L)	0								
Aluminum (ug/L)	0								
Iron (ug/L)	0								
Manganese (ug/L)	0								
Mercury (ug/L)	0								
Arsenic (ug/L)	0								
Hardness (mg/L)	0								

(* Fecal Coliform Geomean)

(** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.
Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.)

(*** Standard Deviation range of values is also affected by climate and storm events and etc.)

01/01/2020-12/31/2020 Summary Report

Station Id:	Big Alamance Crk at NC 87 nr Swepsonville								
B1940000/UCFRBA_14		**Stream Class:**	C NSW			**Sub-Basin:**	CPF02		
County:	Alamance	**Latitude:**	36.0242	**Longitude:**	-79.3943	**HUC:**	3030002		

Parameter	**Count**	**< DT**	**WQS**	**# Exceed**	**MIN**	**MAX**	**AVG**	**Median**	**Std Dev*** **
Temperature (C)	17	0	32	0	8.5	27.8	19.18	20.7	6.15
pH (su)	17	0	6~9	0	6.8	7.1	6.97	7	0.1
Diss. Oxy. (mg/L)	17	0	4	0	5.9	11.4	8.05	7.9	1.67
Conductivity (umhos/cm)	17	0	NA	0	79	142	104	106	15.25
Fecal Coliform (col/100ml)	17	0	400	**7**	0	8600	0.00*	390	2357.65
Lab Turbidity (NTU)	17	0	50	**1**	0	53.9	16.17	13.4	17
TSS (mg/L)	17	**3**	NA	0	0	76	12.75	5	19.36
Chlorophyll-a (ug/L)	0								
NH3-N (mg/L)	17	**9**	NA	0	0	0.05	0.01	0.01	0.02
TKN-N (mg/L)	17	0	NA	0	0	1.14	0.42	0.52	0.32
NO2-NO3 (mg/L)	17	0	NA	0	0	0.41	0.15	0.18	0.13
T. Phos. (mg/L)	17	0	NA	0	0	0.11	0.04	0.04	0.04
Cadmium (ug/L)	0								
Chromium (ug/L)	0								
Copper (ug/L)	0								
Nickel (ug/L)	0								
Lead (ug/L)	0								
Zinc (ug/L)	0								
Aluminum (ug/L)	0								
Iron (ug/L)	0								
Manganese (ug/L)	0								
Mercury (ug/L)	0								
Arsenic (ug/L)	0								
Hardness (mg/L)	0								

(* Fecal Coliform Geomean)

(** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.
Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.)

(*** Standard Deviation range of values is also affected by climate and storm events and etc.)

01/01/2020-12/31/2020 Summary Report

Station Id: Haw Riv at SR 1005 nr Saxpahaw

B2000000/UCFRBA_16 **Stream Class:** C NSW **Sub-Basin:** CPF04

County: Alamance **Latitude:** 35.8953 **Longitude:** -79.2585 **HUC:** 3030002

Parameter	Count	< DT	WQS	# Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature (C)	12	0	32	0	8.2	28.6	17.39	17.9	6.41
pH (su)	12	0	6~9	0	6.9	7.4	7.1	7.1	0.15
Diss. Oxy. (mg/L)	12	0	4	0	6	10.6	8.29	8.25	1.49
Conductivity (umhos/cm)	12	0	NA	0	104	243	166.17	180.5	42.08
Fecal Coliform (col/100ml)	12	0	400	3	31	5800	187.75*	162	1827.59
Lab Turbidity (NTU)	12	0	50	2	6.3	90.1	26.56	21.7	23.39
TSS (mg/L)	12	0	NA	0	5	88	23.83	16	25.3
Chlorophyll-a (ug/L)	0								
NH3-N (mg/L)	12	7	NA	0	0.01	0.06	0.03	0.02	0.02
TKN-N (mg/L)	12	0	NA	0	0.4	1.39	0.92	1.06	0.33
NO2-NO3 (mg/L)	12	0	NA	0	0.33	1.37	0.77	0.79	0.3
T. Phos. (mg/L)	12	0	NA	0	0.06	0.31	0.12	0.1	0.07
Cadmium (ug/L)	0								
Chromium (ug/L)	0								
Copper (ug/L)	0								
Nickel (ug/L)	0								
Lead (ug/L)	0								
Zinc (ug/L)	0								
Aluminum (ug/L)	0								
Iron (ug/L)	0								
Manganese (ug/L)	0								
Mercury (ug/L)	0								
Arsenic (ug/L)	0								
Hardness (mg/L)	0								

(* Fecal Coliform Geomean)

(** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.
Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.)

(*** Standard Deviation range of values is also affected by climate and storm events and etc.)

01/01/2020-12/31/2020 Summary Report

Station Id: Haw Riv at SR 1713 nr Bynum

B2100000/UCFRBA_17 **Stream Class:** WS-IV NSW **Sub-Basin:** CPF04

County: Chatham **Latitude:** 35.7716 **Longitude:** -79.1449 **HUC:** 3030002

Parameter	Count	< DT	WQS	# Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature (C)	17	0	32	0	8.4	30.6	20.32	20.9	6.79
pH (su)	17	0	6~9	0	7	8	7.37	7.3	0.29
Diss. Oxy. (mg/L)	17	0	4	0	6.9	11.8	8.78	8.3	1.37
Conductivity (umhos/cm)	17	0	NA	0	82	273	146.18	145	48.2
Fecal Coliform (col/100ml)	17	0	400	1	0	2600	0.00*	36	602.94
Lab Turbidity (NTU)	17	0	50	1	0	61.3	15.31	7.1	17.81
TSS (mg/L)	17	2	NA	0	0	94	10.03	4	21.58
Chlorophyll-a (ug/L)	0								
NH3-N (mg/L)	17	9	NA	0	0	0.07	0.01	0.01	0.02
TKN-N (mg/L)	17	0	NA	0	0	1.17	0.52	0.61	0.39
NO2-NO3 (mg/L)	17	0	10	0	0	1.06	0.46	0.53	0.35
T. Phos. (mg/L)	17	0	NA	0	0	0.22	0.07	0.08	0.06
Cadmium (ug/L)	0								
Chromium (ug/L)	0								
Copper (ug/L)	0								
Nickel (ug/L)	0								
Lead (ug/L)	0								
Zinc (ug/L)	0								
Aluminum (ug/L)	0								
Iron (ug/L)	0								
Manganese (ug/L)	0								
Mercury (ug/L)	0								
Arsenic (ug/L)	0								
Hardness (mg/L)	0								

(* Fecal Coliform Geomean)

(** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.
Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.)

(*** Standard Deviation range of values is also affected by climate and storm events and etc.)

01/01/2020-12/31/2020 Summary Report

Station Id: New Hope Creek at NC 54 nr Durham

B3020000/UCFRBA_19 **Stream Class:** WS-IV NSW **Sub-Basin:** CPF05

County: Durham **Latitude:** 35.9167 **Longitude:** -78.9704 **HUC:** 3030002

Parameter	Count	< DT	WQS	# Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature (C)	17	0	32	0	7.9	27.9	18.48	19.4	5.93
pH (su)	17	0	6~9	0	6.2	7.2	6.83	6.9	0.22
Diss. Oxy. (mg/L)	17	0	4	**3**	2.7	11.1	6.78	7.2	2.15
Conductivity (umhos/cm)	17	0	NA	0	60	160	125.35	128	23.33
Fecal Coliform (col/100ml)	17	0	400	**2**	0	3400	0.00*	110	922.7
Lab Turbidity (NTU)	17	0	50	0	0	48.7	15.54	17	14.04
TSS (mg/L)	17	0	NA	0	0	40	7.06	6	9.12
Chlorophyll-a (ug/L)	0								
NH3-N (mg/L)	17	**9**	NA	0	0	0.05	0.01	0.01	0.01
TKN-N (mg/L)	17	0	NA	0	0	0.9	0.42	0.52	0.31
NO2-NO3 (mg/L)	17	**2**	10	0	0	0.18	0.07	0.09	0.06
T. Phos. (mg/L)	17	0	NA	0	0	0.11	0.05	0.06	0.03
Cadmium (ug/L)	0								
Chromium (ug/L)	0								
Copper (ug/L)	0								
Nickel (ug/L)	0								
Lead (ug/L)	0								
Zinc (ug/L)	0								
Aluminum (ug/L)	0								
Iron (ug/L)	0								
Manganese (ug/L)	0								
Mercury (ug/L)	0								
Arsenic (ug/L)	0								
Hardness (mg/L)	0								

(* Fecal Coliform Geomean)

(** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.
Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.)

(*** Standard Deviation range of values is also affected by climate and storm events and etc.)

01/01/2020-12/31/2020 Summary Report

Station Id:	New Hope Crk above SR1107 at concrete impoundment								
B3039000/UCFRBA_20		**Stream Class:**	WS-IV NSW			**Sub-Basir**	CPF05		
County:	Durham	**Latitude:**	35.8858	**Longitude:**	-78.9653	**HUC:**	3030002		

Parameter	**Count**	**< DT**	**WQS**	**# Exceed**	**MIN**	**MAX**	**AVG**	**Median**	**Std Dev*** **
Temperature (C)	17	0	32	0	9.7	29.1	19.61	21	5.75
pH (su)	17	0	6~9	0	6.51	7.44	7.05	7.1	0.2
Diss. Oxy. (mg/L)	17	0	4	0	5.39	9.57	7.4	7.42	1.13
Conductivity (umhos/cm)	17	0	NA	0	60	421	254.06	220	100.71
Fecal Coliform (col/100ml)	17	0	400	**2**	35	4000	186.71	119	1366.71
Lab Turbidity (NTU)	17	0	50	0	7.4	56.1	23.89	20.15	13.99
TSS (mg/L)	17	0	NA	0	5	41	15.08	14	10.66
Chlorophyll-a (ug/L)	0								
NH3-N (mg/L)	17	**9**	NA	0	0.02	0.18	0.04	0.02	0.05
TKN-N (mg/L)	17	0	NA	0	0.44	1.36	0.94	0.94	0.28
NO2-NO3 (mg/L)	17	**2**	10	0	0.19	6.66	2.4	1.51	2.05
T. Phos. (mg/L)	17	0	NA	0	0.09	0.27	0.14	0.12	0.06
Cadmium (ug/L)	0								
Chromium (ug/L)	0								
Copper (ug/L)	0								
Nickel (ug/L)	0								
Lead (ug/L)	0								
Zinc (ug/L)	0								
Aluminum (ug/L)	0								
Iron (ug/L)	0								
Manganese (ug/L)	0								
Mercury (ug/L)	0								
Arsenic (ug/L)	0								
Hardness (mg/L)	0								

(* Fecal Coliform Geomean)

(** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.
Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.)

(*** Standard Deviation range of values is also affected by climate and storm events and etc.)

01/01/2020-12/31/2020 Summary Report

Station Id:	Northeast Crk at SR 1102 Sedwick Road nr RTP								
B3300000/UCFRBA_21		**Stream Class:**	WS-IV NSW			**Sub-Basin:**	CPF05		
County:	Durham	**Latitude:**	35.88702	**Longitude:**	-78.8994	**HUC:**	3030002		

Parameter	**Count**	**< DT**	**WQS**	**# Exceed**	**MIN**	**MAX**	**AVG**	**Median**	**Std Dev*** **
Temperature (C)	15	0	32	0	7.7	26.7	19.39	20.8	5.49
pH (su)	15	0	6~9	0	6.6	7.3	6.95	7	0.19
Diss. Oxy. (mg/L)	15	0	4	**1**	3.9	9.1	6.59	6.6	1.25
Conductivity (umhos/cm)	15	0	NA	0	99	480	198	188	90.26
Fecal Coliform (col/100ml)	15	0	400	**2**	0	3400	0.00*	200	848.52
Lab Turbidity (NTU)	15	0	50	**7**	0	141	51.1	67.5	44.31
TSS (mg/L)	15	0	NA	0	0	60	18	21	16.5
Chlorophyll-a (ug/L)	0								
NH3-N (mg/L)	15	**6**	NA	0	0	0.08	0.02	0.01	0.03
TKN-N (mg/L)	15	0	NA	0	0	1.11	0.51	0.69	0.38
NO2-NO3 (mg/L)	15	**1**	10	0	0	0.22	0.07	0.08	0.07
T. Phos. (mg/L)	15	0	NA	0	0	0.12	0.06	0.08	0.05
Cadmium (ug/L)	0								
Chromium (ug/L)	0								
Copper (ug/L)	0								
Nickel (ug/L)	0								
Lead (ug/L)	0								
Zinc (ug/L)	0								
Aluminum (ug/L)	0								
Iron (ug/L)	0								
Manganese (ug/L)	0								
Mercury (ug/L)	0								
Arsenic (ug/L)	0								
Hardness (mg/L)	0								

(* Fecal Coliform Geomean)

(** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.
Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.)

(*** Standard Deviation range of values is also affected by climate and storm events and etc.)

01/01/2020-12/31/2020 Summary Report

Station Id:	Northeast Crk at SR 1731 O Kelly Church Road nr Durham								
B3670000/UCFRBA_22		**Stream Class:**	WS-IV NSW			**Sub-Basin:**	CPF05		
County:	Chatham	**Latitude:**	35.8555	**Longitude:**	-78.9397	**HUC:**	3030002		

Parameter	**Count**	**< DT**	**WQS**	**# Exceed**	**MIN**	**MAX**	**AVG**	**Median**	**Std Dev*** **
Temperature (C)	17	0	32	0	10	29.1	19.56	20.9	5.65
pH (su)	17	0	6~9	0	6.8	7.6	7.28	7.3	0.21
Diss. Oxy. (mg/L)	17	0	4	**1**	3.8	10.6	7.74	7.9	1.55
Conductivity (umhos/cm)	17	0	NA	0	112	495	309.29	265	121.4
Fecal Coliform (col/100ml)	17	0	400	**2**	0	2800	0.00*	143	673.44
Lab Turbidity (NTU)	17	0	50	**1**	0	79.1	22.11	24.4	20.56
TSS (mg/L)	17	0	NA	0	0	43	11.24	11	11.42
Chlorophyll-a (ug/L)	0								
NH3-N (mg/L)	17	**9**	NA	0	0	1.28	0.09	0.01	0.3
TKN-N (mg/L)	17	0	NA	0	0	2.54	0.67	0.76	0.61
NO2-NO3 (mg/L)	17	0	10	0	0	2.13	0.52	0.28	0.64
T. Phos. (mg/L)	17	0	NA	0	0	1.19	0.23	0.1	0.31
Cadmium (ug/L)	0								
Chromium (ug/L)	0								
Copper (ug/L)	0								
Nickel (ug/L)	0								
Lead (ug/L)	0								
Zinc (ug/L)	0								
Aluminum (ug/L)	0								
Iron (ug/L)	0								
Manganese (ug/L)	0								
Mercury (ug/L)	0								
Arsenic (ug/L)	0								
Hardness (mg/L)	0								

(* Fecal Coliform Geomean)

(** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.
Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.)

(*** Standard Deviation range of values is also affected by climate and storm events and etc.)

01/01/2020-12/31/2020 Summary Report

Station Id:	Third Fork Crk at NC 54 nr Durham

B3025000/UCFRBA_23 **Stream Class:** WS-IV NSW **Sub-Basin:** CPF05

County: Durham **Latitude:** 35.9187 **Longitude:** -78.9548 **HUC:** 3030002

Parameter	Count	< DT	WQS	# Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature (C)	12	0	32	0	9.1	27.5	17.35	18.85	5.83
pH (su)	12	0	6~9	0	6.9	7.4	7.12	7.15	0.15
Diss. Oxy. (mg/L)	12	0	4	0	4	10.9	7.85	8.05	1.86
Conductivity (umhos/cm)	12	0	NA	0	121	393	239.67	249	66.36
Fecal Coliform (col/100ml)	12	0	400	**4**	76	6600	383.82*	350	1809.08
Lab Turbidity (NTU)	12	0	50	**1**	10.6	80.5	24.43	18.2	19.03
TSS (mg/L)	12	0	NA	0	5	68	15.25	10.5	16.71
Chlorophyll-a (ug/L)	0								
NH3-N (mg/L)	12	**7**	NA	0	0.01	0.12	0.04	0.02	0.04
TKN-N (mg/L)	12	0	NA	0	0.36	1.42	0.7	0.68	0.25
NO2-NO3 (mg/L)	12	0	10	0	0.04	0.39	0.19	0.2	0.08
T. Phos. (mg/L)	12	0	NA	0	0.09	0.17	0.12	0.13	0.02
Cadmium (ug/L)	0								
Chromium (ug/L)	0								
Copper (ug/L)	0								
Nickel (ug/L)	0								
Lead (ug/L)	0								
Zinc (ug/L)	0								
Aluminum (ug/L)	0								
Iron (ug/L)	0								
Manganese (ug/L)	0								
Mercury (ug/L)	0								
Arsenic (ug/L)	0								
Hardness (mg/L)	0								

(* Fecal Coliform Geomean)

(** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.
Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.)

(*** Standard Deviation range of values is also affected by climate and storm events and etc.)

01/01/2020-12/31/2020 Summary Report

Station Id: Morgan Crk at Mason Farm WWTP Entrance at Chapel Hill

B3899180/UCFRBA_24 **Stream Class:** WS-IV NSW **Sub-Basin:** CPF06

County: Orange **Latitude:** 35.8987 **Longitude:** -79.0263 **HUC:** 3030002

Parameter	Count	< DT	WQS	# Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature (C)	16	0	32	0	8.6	27	19.56	21.75	5.46
pH (su)	16	0	6~9	0	6.7	7.4	7.13	7.2	0.18
Diss. Oxy. (mg/L)	16	0	4	0	6.5	10.9	8.18	8	1.17
Conductivity (umhos/cm)	16	0	NA	0	80	206	137.19	134.5	32.96
Fecal Coliform (col/100ml)	16	0	400	3	0	4000	0.00*	143	1169.89
Lab Turbidity (NTU)	16	0	50	0	0	47.1	8.26	5.25	11.96
TSS (mg/L)	16	3	NA	0	0	17	4.12	4.5	4.62
Chlorophyll-a (ug/L)	0								
NH3-N (mg/L)	16	10	NA	0	0	0.02	0.01	0.01	0.01
TKN-N (mg/L)	16	1	NA	0	0	1.17	0.39	0.42	0.35
NO2-NO3 (mg/L)	16	0	10	0	0	0.63	0.22	0.27	0.18
T. Phos. (mg/L)	16	2	NA	0	0	0.09	0.03	0.03	0.03
Cadmium (ug/L)	0								
Chromium (ug/L)	0								
Copper (ug/L)	0								
Nickel (ug/L)	0								
Lead (ug/L)	0								
Zinc (ug/L)	0								
Aluminum (ug/L)	0								
Iron (ug/L)	0								
Manganese (ug/L)	0								
Mercury (ug/L)	0								
Arsenic (ug/L)	0								
Hardness (mg/L)	0								

(* Fecal Coliform Geomean)

(** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.
Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.)

(*** Standard Deviation range of values is also affected by climate and storm events and etc.)

01/01/2020-12/31/2020 Summary Report

Station Id:	Morgan Crk at SR 1726 Old Farrington Rd nr Farrington								
B3900000/UCFRBA_25		**Stream Class:**	WS-IV NSW				**Sub-Basin:**	CPF06	
County:	Chatham	**Latitude:**	35.8612	**Longitude:**	-79.01		**HUC:**	3030002	

Parameter	Count	< DT	WQS	# Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature (C)	17	0	32	0	10	27.4	19.55	22	5.5
pH (su)	17	0	6~9	0	6.7	7.5	7.21	7.3	0.2
Diss. Oxy. (mg/L)	17	0	4	0	6.5	10.4	8.11	8.2	1.1
Conductivity (umhos/cm)	17	0	NA	0	82	525	266.18	289	114.61
Fecal Coliform (col/100ml)	17	0	400	**2**	0	4000	0.00*	124	1116.59
Lab Turbidity (NTU)	17	0	50	**1**	0	68.6	11.11	7.1	16.25
TSS (mg/L)	17	**1**	NA	0	0	70	9.19	6	16.1
Chlorophyll-a (ug/L)	0								
NH3-N (mg/L)	17	**9**	NA	0	0	0.1	0.01	0.01	0.02
TKN-N (mg/L)	17	0	NA	0	0	1.17	0.49	0.59	0.38
NO2-NO3 (mg/L)	17	0	10	0	0	4.86	1.51	1.45	1.46
T. Phos. (mg/L)	17	0	NA	0	0	0.12	0.06	0.07	0.04
Cadmium (ug/L)	0								
Chromium (ug/L)	0								
Copper (ug/L)	0								
Nickel (ug/L)	0								
Lead (ug/L)	0								
Zinc (ug/L)	0								
Aluminum (ug/L)	0								
Iron (ug/L)	0								
Manganese (ug/L)	0								
Mercury (ug/L)	0								
Arsenic (ug/L)	0								
Hardness (mg/L)	0								

(* Fecal Coliform Geomean)

(** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.
Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.)

(*** Standard Deviation range of values is also affected by climate and storm events and etc.)

01/01/2020-12/31/2020 Summary Report

Station Id: Haw Riv at SR 1011 Old US 1 nr Haywood

B4080000/UCFRBA_26 **Stream Class:** WS-IV **Sub-Basin:** CPF04

County: Chatham **Latitude:** 35.6164 **Longitude:** -79.0569 **HUC:** 3030002

Parameter	Count	< DT	WQS	# Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature (C)	17	0	32	0	8.9	28.8	20.76	23.3	6.37
pH (su)	17	0	6~9	0	6.8	7.7	7.02	7	0.2
Diss. Oxy. (mg/L)	17	0	4	0	4.7	10.4	7.56	7.6	1.7
Conductivity (umhos/cm)	17	0	NA	0	77	166	130.59	132	18.97
Fecal Coliform (col/100ml)	17	0	400	2	0	1000	0.00*	12	250.1
Lab Turbidity (NTU)	17	0	50	0	0	32.6	10.47	9.1	10.51
TSS (mg/L)	17	0	NA	0	0	18	6.82	7	5.78
Chlorophyll-a (ug/L)	0								
NH3-N (mg/L)	17	5	NA	0	0	0.45	0.07	0.01	0.12
TKN-N (mg/L)	17	0	NA	0	0	1.88	0.71	0.79	0.56
NO2-NO3 (mg/L)	17	0	10	0	0	0.63	0.2	0.22	0.18
T. Phos. (mg/L)	17	0	NA	0	0	0.14	0.06	0.06	0.05
Cadmium (ug/L)	0								
Chromium (ug/L)	0								
Copper (ug/L)	0								
Nickel (ug/L)	0								
Lead (ug/L)	0								
Zinc (ug/L)	0								
Aluminum (ug/L)	0								
Iron (ug/L)	0								
Manganese (ug/L)	0								
Mercury (ug/L)	0								
Arsenic (ug/L)	0								
Hardness (mg/L)	0								

(* Fecal Coliform Geomean)

(** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.
Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.)

(*** Standard Deviation range of values is also affected by climate and storm events and etc.)

01/01/2020-12/31/2020 Summary Report

Station Id: Deep Riv at SR 1011 Old US 1 nr Moncure

B6040300/UCFRBA_27 **Stream Class:** WS-IV **Sub-Basin:** CPF11

County: Chatham **Latitude:** 35.6176 **Longitude:** -79.0912 **HUC:** 3030003

Parameter	Count	< DT	WQS	# Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature (C)	12	0	32	0	8.9	30.3	18.55	19.2	6.7
pH (su)	12	0	6~9	0	6.5	7.1	6.93	7	0.16
Diss. Oxy. (mg/L)	12	0	4	0	5.5	10.6	7.71	7.65	1.64
Conductivity (umhos/cm)	12	0	NA	0	69	141	107.25	105	18.53
Fecal Coliform (col/100ml)	12	0	400	**5**	34	5000	297.14*	400	1517.45
Lab Turbidity (NTU)	12	0	50	**2**	6	88.3	28.65	18.45	27.36
TSS (mg/L)	12	0	NA	0	3	139	26.67	13	38.64
Chlorophyll-a (ug/L)	0								
NH3-N (mg/L)	12	**6**	NA	0	0.01	0.26	0.05	0.02	0.07
TKN-N (mg/L)	12	**1**	NA	0	0.1	1.28	0.77	0.82	0.3
NO2-NO3 (mg/L)	12	0	10	0	0.04	0.75	0.46	0.44	0.2
T. Phos. (mg/L)	12	0	NA	0	0.07	0.33	0.13	0.12	0.07
Cadmium (ug/L)	0								
Chromium (ug/L)	0								
Copper (ug/L)	0								
Nickel (ug/L)	0								
Lead (ug/L)	0								
Zinc (ug/L)	0								
Aluminum (ug/L)	0								
Iron (ug/L)	0								
Manganese (ug/L)	0								
Mercury (ug/L)	0								
Arsenic (ug/L)	0								
Hardness (mg/L)	0								

(* Fecal Coliform Geomean)

(** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.
Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.)

(*** Standard Deviation range of values is also affected by climate and storm events and etc.)

01/01/2020-12/31/2020 Summary Report

Station Id:	Richland Crk at SR 1154 Kersey Valley Rd nr High point								
B4380000/UCFRBA_28		**Stream Class:**	WS-IV CA*			**Sub-Basin:**	CPF08		
County:	Guilford	**Latitude:**	35.941	**Longitude:**	-79.9322	**HUC:**	3030003		

Parameter	**Count**	**< DT**	**WQS**	**# Exceed**	**MIN**	**MAX**	**AVG**	**Median**	**Std Dev*** **
Temperature (C)	17	0	32	0	6.8	29.1	19.35	20.5	6.68
pH (su)	17	0	6~9	0	6.8	7.6	7.21	7.2	0.19
Diss. Oxy. (mg/L)	17	0	4	0	6.2	13	8.7	8.4	1.85
Conductivity (umhos/cm)	17	0	NA	0	68	215	158.12	160	42.23
Fecal Coliform (col/100ml)	17	0	400	**5**	0	6600	0.00*	200	1875.97
Lab Turbidity (NTU)	17	0	50	**1**	0	60.9	10.81	6.4	16.34
TSS (mg/L)	17	**7**	NA	0	0	44	6	1.3	11.62
Chlorophyll-a (ug/L)	0								
NH3-N (mg/L)	17	**5**	NA	0	0	0.15	0.04	0.01	0.05
TKN-N (mg/L)	17	0	NA	0	0	1.12	0.48	0.49	0.39
NO2-NO3 (mg/L)	17	0	10	0	0	0.8	0.33	0.41	0.26
T. Phos. (mg/L)	17	**3**	NA	0	0	0.12	0.04	0.03	0.04
Cadmium (ug/L)	0								
Chromium (ug/L)	0								
Copper (ug/L)	0								
Nickel (ug/L)	0								
Lead (ug/L)	0								
Zinc (ug/L)	0								
Aluminum (ug/L)	0								
Iron (ug/L)	0								
Manganese (ug/L)	0								
Mercury (ug/L)	0								
Arsenic (ug/L)	0								
Hardness (mg/L)	0								

(* Fecal Coliform Geomean)

(** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.
Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.)

(*** Standard Deviation range of values is also affected by climate and storm events and etc.)

01/01/2020-12/31/2020 Summary Report

Station Id:	Deep Riv at SR 1113 Kivett Dr nr Hayworth Spring								
B4350000/UCFRBA_29			**Stream Class:**	WS-IV CA				**Sub-Basin:**	CPF08
County:	Guilford		**Latitude:**	35.9594	**Longitude:**	-79.9061		**HUC:**	3030003

Parameter	**Count**	**< DT**	**WQS**	**# Exceed**	**MIN**	**MAX**	**AVG**	**Median**	**Std Dev*** **
Temperature (C)	17	0	32	0	7.5	29.1	20.32	20.4	7.27
pH (su)	17	0	6~9	0	6.9	7.5	7.18	7.2	0.16
Diss. Oxy. (mg/L)	17	0	4	0	6.2	11.5	8.35	8.3	1.62
Conductivity (umhos/cm)	17	0	NA	0	77	131	105.65	106	15.62
Fecal Coliform (col/100ml)	17	0	400	**4**	0	4800	0.00*	76	1410.18
Lab Turbidity (NTU)	17	0	50	0	0	35.1	9.98	10.5	10.21
TSS (mg/L)	17	0	NA	0	0	31	9.24	9	9.24
Chlorophyll-a (ug/L)	0								
NH3-N (mg/L)	17	**12**	NA	0	0	0.01	0.01	0.01	0.01
TKN-N (mg/L)	17	0	NA	0	0	1.52	0.59	0.64	0.46
NO2-NO3 (mg/L)	17	**1**	10	0	0	0.7	0.14	0.12	0.17
T. Phos. (mg/L)	17	0	NA	0	0	0.09	0.04	0.04	0.03
Cadmium (ug/L)	0								
Chromium (ug/L)	0								
Copper (ug/L)	0								
Nickel (ug/L)	0								
Lead (ug/L)	0								
Zinc (ug/L)	0								
Aluminum (ug/L)	0								
Iron (ug/L)	0								
Manganese (ug/L)	0								
Mercury (ug/L)	0								
Arsenic (ug/L)	0								
Hardness (mg/L)	0								

(* Fecal Coliform Geomean)

(** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.
Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.)

(*** Standard Deviation range of values is also affected by climate and storm events and etc.)

01/01/2020-12/31/2020 Summary Report

Station Id:	Muddy Creek at SR 1917 (Suites Road) nr Glenola								
B4621000/UCFRBA_31A		**Stream Class:**	WS-IV			**Sub-Basin:**	CPF08		
County:	Randolph	**Latitude:**	35.8836	**Longitude:**	-79.895	**HUC:**	3030003		

Parameter	**Count**	**< DT**	**WQS**	**# Exceed**	**MIN**	**MAX**	**AVG**	**Median**	**Std Dev*** **
Temperature (C)	12	0	32	0	7.5	24.8	17.18	18.8	6.16
pH (su)	12	0	6~9	0	6.7	7.5	7.14	7.2	0.21
Diss. Oxy. (mg/L)	12	0	4	0	6.7	11.5	8.88	9.6	1.52
Conductivity (umhos/cm)	12	0	NA	0	67	191	136.92	157.5	38.06
Fecal Coliform (col/100ml)	12	0	400	**4**	86	12000	616.91*	300	3509.97
Lab Turbidity (NTU)	12	0	50	**1**	2.3	60.5	15.53	9.35	17.25
TSS (mg/L)	12	**5**	NA	0	1.25	43	11.13	3	14.48
Chlorophyll-a (ug/L)	0								
NH3-N (mg/L)	12	**11**	NA	0	0.01	0.07	0.02	0.01	0.02
TKN-N (mg/L)	12	0	NA	0	0.23	1.11	0.71	0.78	0.28
NO2-NO3 (mg/L)	12	0	10	0	0.09	0.66	0.42	0.45	0.15
T. Phos. (mg/L)	12	**1**	NA	0	0.01	0.15	0.07	0.06	0.04
Cadmium (ug/L)	0								
Chromium (ug/L)	0								
Copper (ug/L)	0								
Nickel (ug/L)	0								
Lead (ug/L)	0								
Zinc (ug/L)	0								
Aluminum (ug/L)	0								
Iron (ug/L)	0								
Manganese (ug/L)	0								
Mercury (ug/L)	0								
Arsenic (ug/L)	0								
Hardness (mg/L)	0								

(* Fecal Coliform Geomean)

(** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.
Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.)

(*** Standard Deviation range of values is also affected by climate and storm events and etc.)

01/01/2020-12/31/2020 Summary Report

Station Id:	Haskett Crk at Asheboro WWTP Bridge nr Asheboro								
B4870000/UCFRBA_32		**Stream Class:**	C			**Sub-Basin:**	CPF09		
County:	Randolph	**Latitude:**	35.7647	**Longitude:**	-79.7862	**HUC:**	3030003		

Parameter	**Count**	**< DT**	**WQS**	**# Exceed**	**MIN**	**MAX**	**AVG**	**Median**	**Std Dev*** **
Temperature (C)	12	0	32	0	6.4	27	16.63	17.95	6.71
pH (su)	12	0	6~9	0	6.7	7.5	7.08	7.15	0.22
Diss. Oxy. (mg/L)	12	0	4	0	5.9	11.9	9.18	9.8	1.89
Conductivity (umhos/cm)	12	0	NA	0	60	189	107.08	121	36.51
Fecal Coliform (col/100ml)	12	0	400	**9**	30	12000	998.42*	1200	4368.8
Lab Turbidity (NTU)	12	0	50	**1**	3.5	70.2	24.17	26.7	20.11
TSS (mg/L)	12	**3**	NA	0	1.25	50	12.07	10.5	13.44
Chlorophyll-a (ug/L)	0								
NH3-N (mg/L)	12	**9**	NA	0	0.01	0.07	0.02	0.01	0.02
TKN-N (mg/L)	12	**1**	NA	0	0.1	1.19	0.64	0.62	0.28
NO2-NO3 (mg/L)	12	0	NA	0	0.04	0.46	0.22	0.26	0.13
T. Phos. (mg/L)	12	**2**	NA	0	0.01	0.1	0.05	0.05	0.03
Cadmium (ug/L)	0								
Chromium (ug/L)	0								
Copper (ug/L)	0								
Nickel (ug/L)	0								
Lead (ug/L)	0								
Zinc (ug/L)	0								
Aluminum (ug/L)	0								
Iron (ug/L)	0								
Manganese (ug/L)	0								
Mercury (ug/L)	0								
Arsenic (ug/L)	0								
Hardness (mg/L)	0								

(* Fecal Coliform Geomean)

(** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.
Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.)

(*** Standard Deviation range of values is also affected by climate and storm events and etc.)

01/01/2020-12/31/2020 Summary Report

Station Id:	Deep Riv at Bus 220 Main St at Randleman								
B4770500/UCFRBA_33		**Stream Class:**	C			**Sub-Basin:**	CPF08		
County:	Randolph	**Latitude:**	35.8233	**Longitude:**	-79.8033	**HUC:**	3030003		

Parameter	**Count**	**< DT**	**WQS**	**# Exceed**	**MIN**	**MAX**	**AVG**	**Median**	**Std Dev*** **
Temperature (C)	17	0	32	0	8.7	29.3	19.94	21	6.47
pH (su)	17	0	6~9	0	6.9	7.7	7.22	7.2	0.19
Diss. Oxy. (mg/L)	17	0	4	0	6.7	11	8.35	8.4	1.37
Conductivity (umhos/cm)	17	0	NA	0	96	146	118.18	119	11.97
Fecal Coliform (col/100ml)	17	0	400	**3**	0	2400	0.00*	67	561.59
Lab Turbidity (NTU)	17	0	50	0	0	36.4	7.59	6.7	8.49
TSS (mg/L)	17	0	NA	0	0	20	5.76	6	5.71
Chlorophyll-a (ug/L)	0								
NH3-N (mg/L)	17	**8**	NA	0	0	0.23	0.04	0.01	0.07
TKN-N (mg/L)	17	0	NA	0	0	1.12	0.48	0.53	0.37
NO2-NO3 (mg/L)	17	**1**	NA	0	0	0.69	0.15	0.06	0.21
T. Phos. (mg/L)	17	**2**	NA	0	0	0.06	0.03	0.03	0.02
Cadmium (ug/L)	0								
Chromium (ug/L)	0								
Copper (ug/L)	0								
Nickel (ug/L)	0								
Lead (ug/L)	0								
Zinc (ug/L)	0								
Aluminum (ug/L)	0								
Iron (ug/L)	0								
Manganese (ug/L)	0								
Mercury (ug/L)	0								
Arsenic (ug/L)	0								
Hardness (mg/L)	0								

(* Fecal Coliform Geomean)

(** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.
Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.)

(*** Standard Deviation range of values is also affected by climate and storm events and etc.)

01/01/2020-12/31/2020 Summary Report

Station Id:	Deep Riv at SR 2122/2128 Worthville Rd at Worthville								
B4800000/UCFRBA_34		**Stream Class:**	C			**Sub-Basin:**	CPF09		
County:	Randolph	**Latitude:**	35.8007	**Longitude:**	-79.7762	**HUC:**	3030003		

Parameter	**Count**	**< DT**	**WQS**	**# Exceed**	**MIN**	**MAX**	**AVG**	**Median**	**Std Dev*** **
Temperature (C)	17	0	32	0	8.4	30.1	20.2	20.7	6.71
pH (su)	17	0	6~9	0	7	7.5	7.25	7.3	0.15
Diss. Oxy. (mg/L)	17	0	4	0	6.8	11.3	8.67	8.7	1.54
Conductivity (umhos/cm)	17	0	NA	0	95	143	116.24	118	12.61
Fecal Coliform (col/100ml)	17	0	400	**6**	0	11400	0.00*	171	2700.21
Lab Turbidity (NTU)	17	0	50	**1**	5.2	82.9	15.98	11.7	17.6
TSS (mg/L)	17	0	NA	0	3	96	13.53	8	20.88
Chlorophyll-a (ug/L)	17	0	40	0	4.6	25.9	13.34	15.3	6.74
NH3-N (mg/L)	17	**12**	NA	0	0.01	0.19	0.03	0.01	0.05
TKN-N (mg/L)	17	0	NA	0	0.36	1.49	0.74	0.73	0.28
NO2-NO3 (mg/L)	17	0	NA	0	0.05	0.75	0.26	0.21	0.19
T. Phos. (mg/L)	17	0	NA	0	0.03	0.2	0.08	0.08	0.04
Cadmium (ug/L)	0								
Chromium (ug/L)	0								
Copper (ug/L)	0								
Nickel (ug/L)	0								
Lead (ug/L)	0								
Zinc (ug/L)	0								
Aluminum (ug/L)	0								
Iron (ug/L)	0								
Manganese (ug/L)	0								
Mercury (ug/L)	0								
Arsenic (ug/L)	0								
Hardness (mg/L)	0								

(* Fecal Coliform Geomean)

(** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.
Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.)

(*** Standard Deviation range of values is also affected by climate and storm events and etc.)

01/01/2020-12/31/2020 Summary Report

Station Id:	Deep Riv at SR 2261 Old Liberty Rd nr Central Falls								
B4920000/UCFRBA_35		**Stream Class:**	C			**Sub-Basin:**	CPF09		
County:	Randolph	**Latitude:**	35.7635	**Longitude:**	-79.7721	**HUC:**	3030003		

Parameter	**Count**	**< DT**	**WQS**	**# Exceed**	**MIN**	**MAX**	**AVG**	**Median**	**Std Dev*** **
Temperature (C)	17	0	32	0	8.5	31.5	20.64	20.9	7.11
pH (su)	17	0	6~9	0	6.9	7.3	7.18	7.2	0.11
Diss. Oxy. (mg/L)	17	0	4	0	6.8	11.2	8.62	8.4	1.58
Conductivity (umhos/cm)	17	0	NA	0	96	149	123.24	122	14.32
Fecal Coliform (col/100ml)	17	0	400	**5**	0	8200	0.00*	133	1941.37
Lab Turbidity (NTU)	17	0	50	**1**	0	74.3	12.55	10.2	17.12
TSS (mg/L)	17	0	NA	0	0	95	12.18	9	21.41
Chlorophyll-a (ug/L)	0								
NH3-N (mg/L)	17	**9**	NA	0	0	0.17	0.02	0.01	0.04
TKN-N (mg/L)	17	0	NA	0	0	1.19	0.52	0.67	0.39
NO2-NO3 (mg/L)	17	0	NA	0	0	0.79	0.3	0.25	0.29
T. Phos. (mg/L)	17	0	NA	0	0	0.2	0.06	0.07	0.05
Cadmium (ug/L)	0								
Chromium (ug/L)	0								
Copper (ug/L)	0								
Nickel (ug/L)	0								
Lead (ug/L)	0								
Zinc (ug/L)	0								
Aluminum (ug/L)	0								
Iron (ug/L)	0								
Manganese (ug/L)	0								
Mercury (ug/L)	0								
Arsenic (ug/L)	0								
Hardness (mg/L)	0								

(* Fecal Coliform Geomean)

(** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.
Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.)

(*** Standard Deviation range of values is also affected by climate and storm events and etc.)

01/01/2020-12/31/2020 Summary Report

Station Id:	Deep Riv at SR 2615 Brooklyn Ave at Ramseur								
B5070000/UCFRBA_36		**Stream Class:**	C			**Sub-Basin:**	CPF09		
County:	Randolph	**Latitude:**	35.7302	**Longitude:**	-79.6558	**HUC:**	3030003		

Parameter	**Count**	**< DT**	**WQS**	**# Exceed**	**MIN**	**MAX**	**AVG**	**Median**	**Std Dev*** **
Temperature (C)	17	0	32	0	7.8	30.1	20.1	20.3	6.97
pH (su)	17	0	6~9	0	6.8	7.5	7.18	7.2	0.17
Diss. Oxy. (mg/L)	17	0	4	0	6.2	11.2	8.51	8.4	1.65
Conductivity (umhos/cm)	17	0	NA	0	65	178	119.53	122	22.95
Fecal Coliform (col/100ml)	17	0	400	**6**	0	8200	0.00*	250	2041.69
Lab Turbidity (NTU)	17	0	50	**1**	0	84.5	15.64	9.2	21.64
TSS (mg/L)	17	0	NA	0	0	106	13.47	9	24.52
Chlorophyll-a (ug/L)	0								
NH3-N (mg/L)	17	**8**	NA	0	0	0.12	0.02	0.01	0.03
TKN-N (mg/L)	17	0	NA	0	0	1.45	0.63	0.81	0.46
NO2-NO3 (mg/L)	17	0	NA	0	0	0.96	0.32	0.26	0.29
T. Phos. (mg/L)	17	0	NA	0	0	0.19	0.06	0.07	0.05
Cadmium (ug/L)	0								
Chromium (ug/L)	0								
Copper (ug/L)	0								
Nickel (ug/L)	0								
Lead (ug/L)	0								
Zinc (ug/L)	0								
Aluminum (ug/L)	0								
Iron (ug/L)	0								
Manganese (ug/L)	0								
Mercury (ug/L)	0								
Arsenic (ug/L)	0								
Hardness (mg/L)	0								

(* Fecal Coliform Geomean)

(** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.
Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.)

(*** Standard Deviation range of values is also affected by climate and storm events and etc.)

01/01/2020-12/31/2020 Summary Report

Station Id:	Deep Riv at SR 2628 Hinshaw Town Rd nr Parks Crossroads					
B5100000/UCFRBA_37		Stream Class:	C		**Sub-Basin:**	CPF09
County:	Randolph	Latitude:	35.6724	**Longitude:**	-79.6274	**HUC:**	3030003

Parameter	Count	< DT	WQS	# Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature (C)	17	0	32	0	7.9	30	20.06	20.3	6.94
pH (su)	17	0	6~9	0	6.7	7.4	7.11	7.1	0.14
Diss. Oxy. (mg/L)	17	0	4	0	6.2	11.2	8.41	8.4	1.63
Conductivity (umhos/cm)	17	0	NA	0	66	181	123.18	132	24.61
Fecal Coliform (col/100ml)	17	0	400	**6**	0	9400	0.00*	181	2357.98
Lab Turbidity (NTU)	17	0	50	**1**	0	90.5	16.21	9.3	22.68
TSS (mg/L)	17	0	NA	0	0	105	13.35	8	24.16
Chlorophyll-a (ug/L)	0								
NH3-N (mg/L)	17	**8**	NA	0	0	0.13	0.02	0.01	0.03
TKN-N (mg/L)	17	0	NA	0	0	1.75	0.64	0.67	0.52
NO2-NO3 (mg/L)	17	0	NA	0	0	0.96	0.32	0.26	0.29
T. Phos. (mg/L)	17	0	NA	0	0	0.18	0.06	0.06	0.05
Cadmium (ug/L)	0								
Chromium (ug/L)	0								
Copper (ug/L)	0								
Nickel (ug/L)	0								
Lead (ug/L)	0								
Zinc (ug/L)	0								
Aluminum (ug/L)	0								
Iron (ug/L)	0								
Manganese (ug/L)	0								
Mercury (ug/L)	0								
Arsenic (ug/L)	0								
Hardness (mg/L)	0								

(* Fecal Coliform Geomean)

(** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.
Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.)

(*** Standard Deviation range of values is also affected by climate and storm events and etc.)

01/01/2020-12/31/2020 Summary Report

Station Id: Cotton Crk at SR 1372 Auman Rd nr Star

B5390800/UCFRBA_39 **Stream Class:** WS-III **Sub-Basin:** CPF10

County: Montgomery **Latitude:** 35.3782 **Longitude:** -79.7551 **HUC:** 3030003

Parameter	Count	< DT	WQS	# Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature (C)	17	0	32	0	6.6	29.9	18.23	17.9	6.53
pH (su)	17	0	6~9	0	6.7	7	6.84	6.8	0.11
Diss. Oxy. (mg/L)	17	0	4	0	5.8	11.2	8.01	7.4	1.65
Conductivity (umhos/cm)	17	0	NA	0	84	201	140.41	148	32.18
Fecal Coliform (col/100ml)	17	0	400	9	0	12000	0.00*	490	4640.09
Lab Turbidity (NTU)	17	0	50	1	0	73.7	16.19	10.3	20.52
TSS (mg/L)	17	2	NA	0	0	48	9.04	5	13.28
Chlorophyll-a (ug/L)	0								
NH3-N (mg/L)	17	7	NA	0	0	0.15	0.04	0.01	0.05
TKN-N (mg/L)	17	0	NA	0	0	1.71	0.76	0.95	0.62
NO2-NO3 (mg/L)	17	0	10	0	0	3.88	1.2	1.21	1.28
T. Phos. (mg/L)	17	0	NA	0	0	0.67	0.19	0.18	0.2
Cadmium (ug/L)	0								
Chromium (ug/L)	0								
Copper (ug/L)	0								
Nickel (ug/L)	0								
Lead (ug/L)	0								
Zinc (ug/L)	0								
Aluminum (ug/L)	0								
Iron (ug/L)	0								
Manganese (ug/L)	0								
Mercury (ug/L)	0								
Arsenic (ug/L)	0								
Hardness (mg/L)	0								

(* Fecal Coliform Geomean)

(** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.
Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.)

(*** Standard Deviation range of values is also affected by climate and storm events and etc.)

01/01/2020-12/31/2020 Summary Report

Station Id:	Deep Riv at Deep River Park Bridge nr Cumnock				
B5685000/UCFRBA_41		**Stream Class:**	C		**Sub-Basin:** CPF11
County:	Chatham	**Latitude:**	35.5704	**Longitude:** -79.2411	**HUC:** 3030003

Parameter	Count	< DT	WQS	# Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature (C)	17	0	32	0	8.7	30.7	20.59	20.5	6.93
pH (su)	17	0	6~9	0	6.2	7	6.75	6.8	0.22
Diss. Oxy. (mg/L)	17	0	4	0	5.2	10.6	7.16	7	1.66
Conductivity (umhos/cm)	17	0	NA	0	64	130	99.71	100	16.53
Fecal Coliform (col/100ml)	17	0	400	**5**	0	5200	0.00*	148	1497.53
Lab Turbidity (NTU)	17	0	50	**2**	0	98.4	21.39	14.5	28.76
TSS (mg/L)	17	0	NA	0	0	112	17.18	8	28.13
Chlorophyll-a (ug/L)	0								
NH3-N (mg/L)	17	**6**	NA	0	0	0.25	0.03	0.01	0.06
TKN-N (mg/L)	17	0	NA	0	0	1.26	0.66	0.85	0.45
NO2-NO3 (mg/L)	17	0	NA	0	0	0.76	0.32	0.37	0.27
T. Phos. (mg/L)	17	0	NA	0	0	0.32	0.09	0.08	0.08
Cadmium (ug/L)	0								
Chromium (ug/L)	0								
Copper (ug/L)	0								
Nickel (ug/L)	0								
Lead (ug/L)	0								
Zinc (ug/L)	0								
Aluminum (ug/L)	0								
Iron (ug/L)	0								
Manganese (ug/L)	0								
Mercury (ug/L)	0								
Arsenic (ug/L)	0								
Hardness (mg/L)	0								

(* Fecal Coliform Geomean)

(** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.
Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.)

(*** Standard Deviation range of values is also affected by climate and storm events and etc.)

01/01/2020-12/31/2020 Summary Report

Station Id:	Deep Riv at US 15 And 501 nr Sanford								
B5820000/UCFRBA_42		**Stream Class:**	C			**Sub-Basin:**	CPF11		
County:	Lee	**Latitude:**	35.5782	**Longitude:**	-79.1942	**HUC:**	3030003		

Parameter	**Count**	**< DT**	**WQS**	**# Exceed**	**MIN**	**MAX**	**AVG**	**Median**	**Std Dev*** **
Temperature (C)	17	0	32	0	8.7	30.6	20.62	20.5	6.94
pH (su)	17	0	6~9	0	6.5	7	6.81	6.8	0.15
Diss. Oxy. (mg/L)	17	0	4	0	5.3	10.5	7.23	7.1	1.63
Conductivity (umhos/cm)	17	0	NA	0	66	130	101.18	100	17.03
Fecal Coliform (col/100ml)	17	0	400	**5**	0	5800	0.00*	86	1510.92
Lab Turbidity (NTU)	17	0	50	**2**	0	104	20.91	15.4	28.67
TSS (mg/L)	17	0	NA	0	0	111	19.53	10	29.83
Chlorophyll-a (ug/L)	0								
NH3-N (mg/L)	17	**6**	NA	0	0	0.25	0.03	0.01	0.06
TKN-N (mg/L)	17	0	NA	0	0	1.59	0.63	0.71	0.48
NO2-NO3 (mg/L)	17	0	NA	0	0	0.75	0.32	0.4	0.27
T. Phos. (mg/L)	17	0	NA	0	0	0.33	0.1	0.1	0.09
Cadmium (ug/L)	0								
Chromium (ug/L)	0								
Copper (ug/L)	0								
Nickel (ug/L)	0								
Lead (ug/L)	0								
Zinc (ug/L)	0								
Aluminum (ug/L)	0								
Iron (ug/L)	0								
Manganese (ug/L)	0								
Mercury (ug/L)	0								
Arsenic (ug/L)	0								
Hardness (mg/L)	0								

(* Fecal Coliform Geomean)

(** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.
Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.)

(*** Standard Deviation range of values is also affected by climate and storm events and etc.)

01/01/2020-12/31/2020 Summary Report

Station Id: Rocky Riv at US 64 nr Siler City

B5950000/UCFRBA_43 **Stream Class:** C **Sub-Basin:** CPF11

County: Chatham **Latitude:** 35.7351 **Longitude:** -79.4233 **HUC:** 3030003

Parameter	Count	< DT	WQS	# Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature (C)	17	0	32	0	8.8	30.8	20.53	21.9	6.82
pH (su)	17	0	6~9	0	6.7	7.3	6.91	6.9	0.17
Diss. Oxy. (mg/L)	17	0	4	0	4	11.1	7.91	7.8	1.82
Conductivity (umhos/cm)	17	0	NA	0	60	105	82.24	83	11.72
Fecal Coliform (col/100ml)	17	0	400	4	0	12600	0.00*	76	2946.1
Lab Turbidity (NTU)	17	0	50	1	5.1	114	18.12	10.5	25.25
TSS (mg/L)	17	0	NA	0	4	74	12.12	8	15.87
Chlorophyll-a (ug/L)	17	0	40	2	3.3	46.2	16.24	12.4	13.85
NH3-N (mg/L)	17	9	NA	0	0.01	0.18	0.04	0.03	0.05
TKN-N (mg/L)	17	0	NA	0	0.72	1.86	1.07	1.04	0.27
NO2-NO3 (mg/L)	17	0	NA	0	0.03	1.07	0.32	0.29	0.28
T. Phos. (mg/L)	17	0	NA	0	0.05	0.3	0.11	0.09	0.07
Cadmium (ug/L)	0								
Chromium (ug/L)	0								
Copper (ug/L)	0								
Nickel (ug/L)	0								
Lead (ug/L)	0								
Zinc (ug/L)	0								
Aluminum (ug/L)	0								
Iron (ug/L)	0								
Manganese (ug/L)	0								
Mercury (ug/L)	0								
Arsenic (ug/L)	0								
Hardness (mg/L)	0								

(* Fecal Coliform Geomean)

(** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.
Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.)

(*** Standard Deviation range of values is also affected by climate and storm events and etc.)

01/01/2020-12/31/2020 Summary Report

Station Id:	Rocky Riv at SR 2170 Rives Chapel Rd nr Siler City				
B5980000/UCFRBA_44		**Stream Class:**	C	**Sub-Basin:**	CPF11
County:	Chatham	**Latitude:**	35.6985 **Longitude:** -79.3756	**HUC:**	3030003

Parameter	Count	< DT	WQS	# Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature (C)	17	0	32	0	8.3	29.7	20.01	20.9	6.6
pH (su)	17	0	6~9	0	6.8	7.3	6.98	7	0.11
Diss. Oxy. (mg/L)	17	0	4	0	5.3	11.2	7.75	7.3	1.63
Conductivity (umhos/cm)	17	0	NA	0	75	396	195.65	167	103.3
Fecal Coliform (col/100ml)	17	0	400	**5**	0	9800	0.00*	105	2629.24
Lab Turbidity (NTU)	17	0	50	**1**	0	107	16.42	6.4	26.17
TSS (mg/L)	17	0	NA	0	0	73	9.76	4	17.49
Chlorophyll-a (ug/L)	0								
NH3-N (mg/L)	17	**6**	NA	0	0	0.51	0.05	0.01	0.12
TKN-N (mg/L)	17	0	NA	0	0	2.07	0.86	0.97	0.64
NO2-NO3 (mg/L)	17	0	NA	0	0	5.54	0.96	0.83	1.43
T. Phos. (mg/L)	17	0	NA	0	0	0.31	0.09	0.08	0.09
Cadmium (ug/L)	0								
Chromium (ug/L)	0								
Copper (ug/L)	0								
Nickel (ug/L)	0								
Lead (ug/L)	0								
Zinc (ug/L)	0								
Aluminum (ug/L)	0								
Iron (ug/L)	0								
Manganese (ug/L)	0								
Mercury (ug/L)	0								
Arsenic (ug/L)	0								
Hardness (mg/L)	0								

(* Fecal Coliform Geomean)

(** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.
Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.)

(*** Standard Deviation range of values is also affected by climate and storm events and etc.)

01/01/2020-12/31/2020 Summary Report

Station Id:	Loves Creek at Waste Management Plant Rd in Siler City								
B5890000/UCFRBA_45		**Stream Class:**	C				**Sub-Basin:**	CPF12	
County:	Chatham	**Latitude:**	35.7289	**Longitude:**	-79.4289		**HUC:**	3030002	

Parameter	**Count**	**< DT**	**WQS**	**# Exceed**	**MIN**	**MAX**	**AVG**	**Median**	**Std Dev*** **
Temperature (C)	17	0	32	0	6.9	26.8	18.43	20.4	6.01
pH (su)	17	0	6~9	0	6.6	7.3	7.17	7.3	0.19
Diss. Oxy. (mg/L)	17	0	4	0	6.8	11.3	8.51	8.6	1.48
Conductivity (umhos/cm)	17	0	NA	0	78	272	169.59	167	48.18
Fecal Coliform (col/100ml)	17	0	400	**2**	0	12200	0.00*	162	2860.24
Lab Turbidity (NTU)	17	0	50	**1**	0	73.2	11.69	6.4	17.84
TSS (mg/L)	17	**4**	NA	0	0	32	4.42	3	7.73
Chlorophyll-a (ug/L)	0								
NH3-N (mg/L)	17	**11**	NA	0	0	0.12	0.01	0.01	0.03
TKN-N (mg/L)	17	**1**	NA	0	0	1.16	0.37	0.42	0.33
NO2-NO3 (mg/L)	17	0	NA	0	0	0.74	0.3	0.39	0.24
T. Phos. (mg/L)	17	0	NA	0	0	0.13	0.04	0.03	0.04
Cadmium (ug/L)	0								
Chromium (ug/L)	0								
Copper (ug/L)	0								
Nickel (ug/L)	0								
Lead (ug/L)	0								
Zinc (ug/L)	0								
Aluminum (ug/L)	0								
Iron (ug/L)	0								
Manganese (ug/L)	0								
Mercury (ug/L)	0								
Arsenic (ug/L)	0								
Hardness (mg/L)	0								

(* Fecal Coliform Geomean)

(** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.
Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.)

(*** Standard Deviation range of values is also affected by climate and storm events and etc.)

01/01/2020-12/31/2020 Summary Report

Station Id: Loves Creek at Progress Blvd at Siler City

B5920000/UCFRBA_46 **Stream Class:** C **Sub-Basin:** CPF12

County: Chatham **Latitude:** 35.7322 **Longitude:** -79.4246 **HUC:** 3030002

Parameter	Count	< DT	WQS	# Exceed	MIN	MAX	AVG	Median	Std Dev***
Temperature (C)	16	0	32	0	11.2	29.1	21.36	22.55	5.96
pH (su)	16	0	6~9	0	7.1	7.8	7.48	7.5	0.18
Diss. Oxy. (mg/L)	16	0	4	0	5.4	11.2	8.44	8.65	1.5
Conductivity (umhos/cm)	16	0	NA	0	178	1011	721.5	839	248.83
Fecal Coliform (col/100ml)	16	0	400	2	0	8400	0.00*	81	2022.7
Lab Turbidity (NTU)	16	0	50	1	0	73.5	8.88	2.95	17.94
TSS (mg/L)	16	6	NA	0	0	32	4.22	1.28	7.88
Chlorophyll-a (ug/L)	0								
NH3-N (mg/L)	16	6	NA	0	0	7.52	1.07	0.01	2.42
TKN-N (mg/L)	16	2	NA	0	0	8.13	1.8	1.02	2.53
NO2-NO3 (mg/L)	16	0	NA	0	0	16	4.14	2.41	5.19
T. Phos. (mg/L)	16	0	NA	0	0	0.22	0.06	0.04	0.06
Cadmium (ug/L)	0								
Chromium (ug/L)	0								
Copper (ug/L)	0								
Nickel (ug/L)	0								
Lead (ug/L)	0								
Zinc (ug/L)	0								
Aluminum (ug/L)	0								
Iron (ug/L)	0								
Manganese (ug/L)	0								
Mercury (ug/L)	0								
Arsenic (ug/L)	0								
Hardness (mg/L)	0								

(* Fecal Coliform Geomean)

(** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.
Copper and Zinc and Iron are considered Action Levels and not NC state water quality standards.)

(*** Standard Deviation range of values is also affected by climate and storm events and etc.)

APPENDIX B: UCFRBA Board of Directors

UPPER CAPE FEAR RIVER BASIN ASSOCIATION

DIRECTORS AND ALTERNATE DIRECTORS
(Primary Contact)

Arclin

Brian Reddy Plant Manager 790 Corinth Road Moncure, NC 27759 Phone: 919-545-7053 Email: brian.reddy@arclin.com	Brad Crawford 790 Corinth Road Moncure, NC 27759 Phone: Email: brad.crawford@arclin.com

City of Asheboro

Michael Rhoney Water Resources Director PO Box 1106 Asheboro, NC 27204-1106 Phone: 336-626-1201 x258 Fax: 336-626-1218 Email: mrhoney@ci.asheboro.nc.us	John Ogburn III City Manager PO Box 1106 Asheboro, NC 27204-1106 Phone: 336-626-1201, ext. 213 Fax: 336-626-1218 Email: jogburn@ci.asheboro.nc.us

City of Burlington

Bob Patterson Director of Water Resources PO Box 1358 Burlington, NC 27216-1358 Phone: 336-222-5130 Fax: 336-222-5019 Email: bpatterson@ci.burlington.nc.us	Eric Davis Water & Sewer Operations Manager PO Box 1358 Burlington, NC 27216-1358 Phone: 336-222-5133 Fax: 336-570-6175 Email: edavis@ci.burlington.nc.us

Town of Cary

Sarah Braman Water Resources Engineer PO Box 8005 Cary, NC 27512-8005 Phone: 919-462-3846 Email: sarah.braman@townofcary.org	Maria Vanderloop Utility Pretreatment Program Supervisor PO Box 8005 Cary, NC 27512-8005 Phone: (919) 319-4564 Email: maria.vanderloop@townofcary.org

City of Durham

Charlie Cocker Plant Superintendent 6605 Farrington Road Chapel Hill, NC 27517 Phone: 919-560-4386, ext.35532 Fax: Email: charles.cocker@durhamnc.gov	Vicki Westbrook Deputy Director of Water Management 101 City Hall Plaza Durham, NC 27701-3328 Phone: 919-560-4381 Fax: 919-560-4479 Email: vicki.westbrook@durhamnc.gov

City of Graham

Tonya Mann Utilities Director PO Drawer 357 Graham, NC 27253 Phone: 336-570-6721 Fax: 336-513-5502 Email: tmann@cityofgraham.com	Cris Routh ORC/WWTP Supervisor PO Drawer 357 Graham, NC 27253 Phone: 336-570-6721 Fax: 336-513-5502 Email: crouth@cityofgraham.com

City of Greensboro

Martie Groome Laboratory and Ind. Waste Section Supervisor PO Box 3136 Greensboro, NC 27402-3136 Phone: 336-433-7229 Fax: 336-373-7720 Email: martie.groome@greensboro-nc.gov	Elijah Williams Waste Reclamation Manager PO Box 3136 Greensboro, NC 27402-3136 Phone: 336-373-4632 Fax: Email: elijah.williams@greensboro-nc.gov

City of High Point

Terry Houk Public Services Director PO Box 230 High Point, NC 27261 Phone: 336-883-3218 Email: terry.houk@highpointnc.gov	Derrick Boone Public Services Assistant Director PO Box 230 High Point, NC 27261 Phone: 336-883-3166 Email: derrick.boone@highpointnc.gov

City of Mebane

Dennis J. Hodge Wastewater Director 106 E. Washington Street Mebane, NC 27302 Phone: 919-304-9215 Fax: 919-563-1007 Email: dhodge@cityofmebane.com	David Cheek City Manager 106 E. Washington Street Mebane, NC 27302 Phone: 919-563-5901 Fax: 919-563-1007 Email: dcheek@cityofmebane.com

Orange Water and Sewer Authority

Jennifer Hunter Wastewater Treatment Plant Lab Supervisor 400 Jones Ferry Road Carrboro, NC 27510 Phone: 919-304-9215 Fax: Email: jhunter@owasa.org	Monica Dodson WWTP & Biosolids Recycling Manager 400 Jones Ferry Road Carrboro, NC 27510 Phone: 919-537-4205 Fax: Email: mdodson@owasa.org

Pilgrim's Pride

Tina Pedley Environmental Manager 7401 Statesville Blvd Salisbury, NC 28147 Phone: 919-210-3527 Fax: 919-542-6324 Email: tina.pedley@pilgrims.com	Jamal Mohammed Complex Manager 7401 Statesville Blvd Salisbury, NC 28147 Phone: Fax: Email:

Town of Pittsboro

Chris Kennedy Town Manager PO Box 759 635 East Street Pittsboro, NC 27312 Phone: 336-708-0425 Fax: 919-542-7109 Email: rmorgan@pittsboronc.gov	Jim Nass Mayor 259 Hillsboro Street Pittsboro, NC 27312 Phone: 336-675-2822 Fax: Email: jnass@pittsboronc.gov

Town of Ramseur

Terry Lewallen WWTP Superintendent PO Box 545 Ramseur, NC 27316 Phone: 336-824-8530 Fax: 336-824-6624 Email: terry.lewallen@suez.com	Vicki Caudle Mayor PO 545 Ramseur, NC 27316 Phone: 336-824-8883 Fax: 336-824-6624 Email: mayor@townoframseur.org

City of Randleman

Michael Glass WWTP Superintendent 204 South Main Street Randleman, NC 27317 Phone: 336-498-2254	William Johnson City Manager 204 South Main Street Randleman, NC 27317 Phone: 336-495-7500

Fax: 336-498-7503 Email: wwtp@northstate.net	Fax: 336-495-7503 Email: wjohnson@cityofrandleman.com

City of Reidsville

Chuck Smith Public Works Director 1100 Vance Street Reidsville, NC 27320 Phone: 336-349-1042 Fax: 336-634-1738 Email: csmith@ci.reidsville.nc.us	Scott Bryan City Manager 230 W. Morehead Street Reidsville, NC 27320 Phone: 336-349-1030 Fax: 336-342-3649 Email: sbryan@ci.reidsville.nc.us

City of Sanford

Victor Czar Public Works Director PO Box 3729 Sanford, NC 27330 Phone: 919-777-1118 Fax: 919-774-8179 Email: victor.czar@sanfordnc.net	Scott Siletzky Water Reclamation Administrator PO Box 3729 Sanford, NC 27330 Phone: 919-777-1781 Fax: 919-776-5037 Email: scott.siletzky@sanfordnc.net

Town of Siler City

Chris McCorquodale Director of Public Works and Utilities PO Box 769 Siler City, NC 27344-0769 Phone: 919-742-4732 ext 225 Fax: 919-663-3874 Email: cmccorquodale@silercity.org	Roy Lynch Town Manager PO Box 769 Siler City, NC 27344-0769 Phone: 919-742-4731 Fax: 919-663-3874 Email: rlynch@silercity.org

Town of Star

Wesley Brown Sewage Treatment Plant Superintendent PO Box 97 Star, NC 27356 Phone: 910-428-4623 Fax: 910-428-1170 Email: townofstar@gmail.com	Mary O'Brien Mayor PO Box 97 Star, NC 27356 Phone: 910-428-4623 Fax: 910-428-1170 Email: townofstar@gmail.com

APPENDIX C: UCFRBA Technical Advisory Committee

NAME	AGENCY	TITLE	EMAIL
Alicia Goots	Greensboro	Lab Coordinator	alicia.goots@greensboro-nc.gov
Anna Leonard	Piedmont Triad Regional Council	Environmental Programs Coordinator	aleonard@ptrc.org
Anne Hershey	UNC-Greensboro: Dept. Biology	Distinguished Professor	anne_hershey@uncg.edu
Ben Bani	Burlington		bbani@burlingtonnc.gov
Bernadine Wardlaw	Asheboro	Water Quality Manager	bwardlaw@ci.asheboro.nc.us
Bill Frazier	High Point	Lab Services Manager	bill.frazier@highpointnc.gov
Bob Patterson	Burlington	Water Resources Director	bpatterson@ci.burlington.nc.us
Bowman Harvey	Arclin	HSE Coordinator	bowman.harvey@arclin.com
Chris Kennedy	Pittsboro	Town Manager	ckennedy@pittsboronc.gov
Roy Lynch	Siler City	Town Manager	rlynch@silercity.org
Cameron Colvin	Piedmont Triad Regional Council	Water Resources Planner	ccolvin@ptrc.org
Charles Cocker	Durham	Superintendent South Durham WRF	charles.cocker@durhamnc.gov
Chris McCorquodale	Siler City	Wastewater Treatment Plant Superintendent	scwastewater@silercity.org
Jim Nass	Pittsboro	Mayor	cperry@pittsboronc.gov
Cris Routh	Graham	ORC & Wastewater Treatment Plant Supervisor	crouth@cityofgraham.com
Danny Shaw	Ramseur	Mayor	shawdr1@hotmail.com
David Phelgar	Greensboro	Monitoring Coordinator – Stormwater	david.phlegar@greensboro-nc.gov
David Cheek	Mebane	City Manager	dcheek@cityofmebane.com
David Merritt	Meritech, Inc.	Vice President	david.merritt@meritechlabs.com
Dawn Molnar	High Point	Laboratory Supervisor	dawn.molnar@highpointnc.gov
Dennis Hodge	Mebane	Wastewater Director	dhodge@cityofmebane.com
Derrick Boone	High Point	Assistant Public Services Director	derrick.boone@highpointnc.gov
Jennifer Hunter	Orange Water and Sewer Authority	WWTP Lab Manager	ekerwin@owasa.org
Elaine Chiosso	Haw River Assembly	Executive Director	hra@emji.net
Elaine Sellars	High Point		elaine.sellars@highpointnc.gov
Elijah Williams	Greensboro	Waste Reclamation Manager	elijah.williams@greensboro-nc.gov

Eric Davis	Burlington	Water and Sewer Operations Manager	edavis@ci.burlington.nc.us
Glenn McGirt	Burlington	Laboratory Supervisor	gmcgirt@burlingtonnc.gov
Godfrey Uzochukwu	NC A&T	Director Management Institute	uzo@ncat.edu
Janet MacFall	Elon University	Professor of Environmental Studies and Biology	macfallj@elon.edu
Maria Vanderloop	Cary	Utility Pretreatment Program Supervisor	maria.vanderloop@townofcary.org
Maya Cough-Schulze	Triangle J Council of Governments	Water Resources Planner	maya.cough-schulze@tjcog.org
John Kent	New Hope Audubon Society		newhopeaudubon@gmail.com
John Kiviniemi	Orange Water and Sewer Authority	Wastewater Treatment & Biosolids Recycling Manager	jkiviniemi@owasa.org
John Ogburn II	Asheboro	City Manager	jogburn@ci.asheboro.nc.us
John Poteat	Pittsboro	Utility Director	jpoteat2@nc.rr.com
Kevin Eason	Reidsville	Public Works Director	keason@ci.reidsville.nc.us
Kevin Wood	High Point	Wastewater Plants Manager	kevin.wood@highpointnc.gov
Amanda Hancock	Meritech, Inc.	Lab Manager	kris.pawlak@meritechlabs.com
Larry Bridges	Chatham County	Utilities Director	larry.bridges@chathamnc.org
Linda Ehrlick	Spirogyra Diversified Environmental Services	Owner	spirogyra@juno.com
Mark Vander Borgh	DEQ DWR	Senior Environmental Biologist	mark.vanderborgh@ncdenr.gov
Martie Groome	Greensboro	Lab/Industrial Waste Supervisor	Martie.Groome@greensboro-nc.gov
Mary Giorgino	USGS		giorgino@usgs.gov
Mary O'Brien	Star	Mayor	townofstar@gmail.com
Michael Glass	Randleman	WWTP Superintendent	mglass816@gmail.com
Michael Layne	Burlington	Stormwater Manager	mlayne@ci.burlington.nc.us
Michael Rhoney	Asheboro	Director	mrhoney@ci.asheboro.nc.us
Michelle Woolfolk	Durham	Water Resources Engineer	michelle.woolfolk@durhamnc.gov
Nick Holcomb	Randleman	City Manager	nholcomb@cityofrandleman.com
Parke Rublee	UNC-Greensboro: Dept. Biology	Professor	rublee@uncg.edu
Patrick Beggs	DEQ DWR	Nonpoint Source Planning	patrick.beggs@ncdenr.gov
Peter Raabe	American Rivers	Conservation Director	praabe@americanrivers.org
Scott Bryan	Reidsville	City Manager	sbryan@ci.reidsville.nc.us
Rich Gannon	DWR – Nonpoint Source Unit	Branch Chief	rich.gannon@ncdenr.gov

Ruth Rouse	Orange Water and Sewer Authority	Planning and Development Manager	RRouse@owasa.org
Ryan Rasmussen	USGS	Triangle Area Water Supply Monitoring	rbrasmus@usgs.gov
Monica Dodson	Orange Water and Sewer Authority	Laboratory Manager	sbradshaw@owasa.org
Sarah Braman	Cary	Water Resources Engineer	sarah.braman@townofcary.org
Scott Siletzky	Sanford	Wastewater Treatment Plant Superintendent	scott.siletzky@sanfordnc.net
Shelby Smith	Graham	Pretreatment Program	ssmith@cityofgraham.com
Steve Tedder	Tedder Farm Consulting		tedderfarmconsulting@gmail.com
Steve Whalen	UNC-CH:Dept. Environ. Science & Eng.	Associate Professor	steve_whalen@unc.edu
Steven Drew	Greensboro	Water Resources Director	steve.drew@greensboro-nc.gov
Jonathan Baker	Durham	Engineer, Stormwater Quality	jonathan.baker@durhamnc.gov
Terry Green	Siler City	Director of Public Works	tgreen@silercity.org
Terry Houk	High Point		Terry.houk@highpointnc.gov
Tina Pedley	Pilgrim's Pride	Wastewater Lab Tech	Tina.Pedley@pilgrims.com
Todd Taylor	Orange Water and Sewer Authority	General Manager of Operations	ttaylor@owasa.org
Tom Duckwall	Friends of the Deep River/Blue Ridge Environmental Defense League	Coordinator	tomfduckwall@cs.com
Tonya Mann	Graham	Utilities Director	tmann@cityofgraham.com
Vicki Westbrook	Durham	Deputy Director of Water Management	vicki.westbrook@durhamnc.gov
Victor Czar	Sanford	Public Works Director	victor.czar@sanfordnc.net
Wesley Brown	Star	Sewage Treatment Plant Superintendent	townofstar@gmail.com

APPENDIX D: UCFRBA Sampling Procedures

1669 Sampling Procedures

A. Supplies

1. Cooler (Hg Only) – Contains the following
    a. Gloves (2x): Large bag with one pair, inside of which is a small bag with two pairs. Lone pair is a backup set.
    b. Sample Bottles (2x): Large bag with bottle lot #, sampling site and date, inside of which is a small bag, also contains same information. The sampling bottle is in the small bag.
    c. Sampling Tubing (1x): Double bagged with the lot # written on the bag. Single use tubing.
    d. Backup Cooler: Items a. through d. will be kept in a separate cooler which will be used as a spare in the event that a problem is encountered with the original kit. Should this kit not be used; it may be used for a subsequent sampling event at the same site.
2. Sampling Supplies – Contains the following
    a. DI Carboy – Wrapped in plastic bag sealed with rubber band.
    b. Peristaltic pump (portable) – Battery operated pump for sampling.
    c. Waste Carboy – Collects waste during the sampling process
    d. Polypropylene Support and Clamp – Used to position the sample tubing for hands free operation.
    e. Sampling Wand – PVC pipe 1" diameter x 10' with T glued to end for better handling. Pipe is notched to accept sample tubing.
    f. Plastic Sheeting – Single use to cover the sampling table. Clamped to the bottom of table.
    g. Garbage Bag – Standard white kitchen garbage bag to collect refuse from sampling event
    h. Sampling Table – 2' x 4' used to setup sampling supplies.
    i. COC (Chain of Custody) – Records sampling information i.e. Client, Date/Time, Lot #'s, Sampling Team, Sampling Conditions, etc.
    j. Two Person Sampling Team (CH/DH) – Clean Hands and Dirty Hands Sampling Team; predetermined to help expedite sampling process.

B. Initial Arrival Set-up.

1 Do not park in close proximity to the sampling site, and whenever possible approach site from downwind.
2. Note sampling site conditions with regards to wind and wind direction; also noting potential sources of contamination from the surrounding area.
3. Setup table close to the sampling site according to the orientation required for sampling the effluent
    a. Clamp down a fresh sheet of plastic on the sampling table.
    b. Put on set of gloves – non-bagged.
    c. Place the DI Water Carboy, Peristaltic Pump, and Tubing Support Stand on the table.
    d. Open the access area to the pump head so that the tubing may be quickly connected to the pump when the samplers are ready.
    e. Place sampling wand on table
    f. Place waste carboy on ground in proximity to the sampling tables.
    g. Tie the garbage bag to the sampling table
    h. Fill out paper work including the sampling conditions and lot #'s of sampling equipment and preservatives.
4. Make final check that the sampling area is accessible and logistically feasible from the table set-up area.
5. Remove any impedance from the sampling area.

C. Sampling – Clean Hands(CH)/Dirty Hands(DH).

1. Assign clean hands and dirty hands technicians.
2. Both CH and DH will now wait ten minutes for the sampling site to equilibrate from any destabilization resulting from the initial set-up.

D. Sampling Wand Collection

1. Field Blank
   a. DH will open the cooler containing the sampling accessories (gloves, tubing, and bottles).
   b. DH opens glove bag for CH to put on two sets of gloves.
   c. DH opens 2nd glove bag and puts on two sets of gloves.
   d. DH opens the bag for the DI carboy.
   e. DH removes the bag containing the sampling tubing, and opens the bag.
   f. CH removes the inner bag containing the tubing, and removes the tubing, but does not allow the ends to come in contact with anything. The ends of the tubing are facing down to avoid contamination.
   g. DH installs the tubing while CH maintains the tubing ends facing down.
   h. DH removes the cap from the carboy.
   i. CH places one end of the tubing into the carboy so that it remains in the carboy, and the other end is placed into the clamp on the support stand.
   j. DH positions the waste carboy under the exit tubing and starts the pump. Rinse tubing with 1L of DI water. DH stops the pump.
   k. DH removes the waste carboy
   l. DH removes the double bagged sample bottle (Field Blank) from the cooler and opens the outer bag. CH removes the bagged bottle, and removes the cap. All baggies should remain in the sampling cooler until the sample bottle is returned.
   m. CH position the bottle under the exit tubing.
   n. DH starts the pump; CH signals to turn off the pump once the bottle is full.
   o. CH replaces the cap, and puts the bottle back to the small bag.
   p. DH opens large bag and CH places bagged bottle into large bag.
   q. DH seals the baggie and puts the sample back into the cooler.
2. Sample – Sampling Wand
   a. DH removes the double bagged sample bottle (Sample) from the cooler and CH removes the single bagged bottle from the large bag placing it on the sampling table.
   b. DH positions the waste carboy with the sampling tubing in the support stand.
   c. DH secures the sampling wand across the sampling table, while CH removes the sampling tubing from the DI carboy.
   d. CH positions the sampling tubing in the sampling wand while DH holds the wand firm.
   e. DH starts the pump while holding the wand against the table.
   f. DH places the sampling wand in the sampling area positioning the end of the wand downstream from the tip of the sampling tubing.
   g. Once approximately 1L of sample is passed through the tubing (2 – 5 minutes) and collected in the waste carboy, CH removes the sample bottle from the small bag, removes the cap, and fills the bottle by placing the bottle above the waste carboy.
   h. Once full, CH replaces the cap, and places the bottle back into the baggie.
   i. DH removes the wand from the sampling area and turns off the pump.
   j. DH puts down the sampling wand on the table, and opens the large baggie for CH to place the sample bottle into.
   k. DH seals the large baggie and places the sample into the sample cooler.
   l. DH and CH may now freely cleanup the sampling area disposing of the sampling tubing and gloves into a garbage bag attached to the sampling table.
   m. CH will finish paper work noting times that the samples were taken and any potential problems with the sampling.

E. Sample – Direct Collection

1. Field Blank
   a. DH will open the cooler containing the sampling accessories (gloves, and bottles).
   b. DH opens glove bag for CH to put on two sets of gloves.
   c. DH opens 2nd glove bag and puts on two sets of gloves.
   d. DH gets double bagged field blank bottle from cooler, opens outer bag and CH removes inner bag setting it on the sampling table.
   e. DH gets double bagged sample bottle, which is full of DI water from the lab, and opens the outer bag.
   f. CH removes the inner bag and removes the bottle and takes off the cap.
   g. CH then removes the field blank bottle from the inner baggie and transfers the DI water from the sample bottle to the field blank bottle.
   h. CH caps the field blank bottle places it back into the baggie, which is placed back into the outer baggie being held open by DH.
   i. DH then seals the baggie and places the bottle into the cooler.
2. Sample
   a. CH takes the emptied sample bottle and fills it it with the waste stream from the sampling site.
   b. CH replaces the cap and places the bottle back in the inner baggie.
   c. DH opens the outer baggie and CH places the bagged sample into the outer baggie.
   d. DH seals the outer baggie and places the bottle into the cooler.
   e. CH and DH can now clean the sampling site and complete all necessary paperwork prior to leaving the site.

APPENDIX E: QA/QC SUMMARIES

Upper Cape Fear River Basin Association QA/QC Committee Report
From QA/QC Data Review Meeting of Wednesday, July 22, 2020

Reviewers: Chair: Dawn Molnar (High Point), Elaine Sellars (High Point), Alicia Goots (City of Greensboro), Glenn McGirt (Burlington), Cameron Colvin (PTRC)

Water Quality Standard (WQS) Exceedances January 2020 through March 2020

January 2020 Upper Cape Fear Monitoring Data – WQS Violations				
UCFRBA Site #	**Date**	**Parameter**	**Reported Value**	**NC WQ Standard**
No Water Quality Standard exceedances noted				

February 2020 Upper Cape Fear Monitoring Data – WQS Violations				
UCFRBA Site #	**Date**	**Parameter**	**Reported Value**	**NC WQ Standard**
No Water Quality Standard exceedances noted				

March 2020 Upper Cape Fear Monitoring Data - WQS Violations				
UCFRBA Site #	**Date**	**Parameter**	**Reported Value**	**NC WQ Standard**
1	3/2/2020	Turbidity	59.0	50 NTU
21	3/27/2020	Turbidity	88.1	50 NTU

January 2020 through March 2020 – Upper Cape Fear Data Notations/Corrections				
Parameter	**UCFRBA Site#**	**Date**	**Reported Value**	**Corrected Value**
Ammonia	46	1/28/2020	0.02 mg/l	<0.02 mg/l

OTHER DATA ISSUES AND CORRECTIONS
NOTE: 1st Quarter QA/QC meeting cancelled due to Covid-19. All 1st quarter field data was reviewed. Sites 43-46 were reviewed for all other parameters for 1st Quarter.

Revision Date: July 22, 2020

Upper Cape Fear River Basin Association QA/QC Committee Report
From QA/QC Data Review Meeting of Wednesday, July 22, 2020

Reviewers: Chair: Dawn Molnar (High Point), Elaine Sellars (High Point), Alicia Goots (City of Greensboro), Glenn McGirt (Burlington), Cameron Colvin (PTRC)

Water Quality Standard (WQS) Exceedances April 2020 through June 2020

April 2020 Upper Cape Fear Monitoring Data – WQS Violations				
UCFRBA Site #	**Date**	**Parameter**	**Reported Value**	**NC WQ Standard**
5	4/14/2020	Turbidity	88.1	50 NTU
7	4/30/2020	Turbidity	94.2	50 NTU
9	4/14/2020	Turbidity	60.2	50 NTU
12	4/14/2020	Turbidity	86.2	50 NTU
13	4/14/2020	Turbidity	88.7	50 NTU
16	4/30/2020	Turbidity	90.1	50 NTU
27	4/30/2020	Turbidity	84.7	50 NTU
41	4/30/2020	Turbidity	98.4	50 NTU
42	4/30/2020	Turbidity	104	50 NTU
43	4/20/2020	Turbidity	114	50 NTU
44	4/30/2020	Turbidity	107	50 NTU
45	4/30/2020	Turbidity	73.2	50 NTU
46	4/30/2020	Turbidity	73.5	50 NTU

May 2020 Upper Cape Fear Monitoring Data – WQS Violations				
UCFRBA Site #	**Date**	**Parameter**	**Reported Value**	**NC WQ Standard**
2	5/21/2020	Turbidity	74.9	50 NTU
3	5/21/2020	Turbidity	72.6	50 NTU
9	5/21/2020	Turbidity	120	50 NTU
10	5/21/2020	Turbidity	57.4	50 NTU
11	5/21/2020	Turbidity	57.1	50 NTU
12	5/21/2020	Turbidity	53.6	50 NTU
13	5/21/2020	Turbidity	54.3	50 NTU
14	5/21/2020	Turbidity	53.9	50 NTU
20	5/22/2020	Turbidity	56.1	50 NTU
21	5/22/2020	Turbidity	141	50 NTU
22	5/22/2020	Turbidity	79.1	50 NTU
23	5/22/2020	Turbidity	80.5	50 NTU
25	5/22/2020	Turbidity	68.6	50 NTU
28	5/20/2020	Turbidity	60.9	50 NTU
31	5/20/2020	Turbidity	60.5	50 NTU
32	5/20/2020	Turbidity	70.2	50 NTU

34	5/202020	Turbidity	82.9	50 NTU
35	5/20/2020	Turbidity	74.3	50 NTU
36	5/20/2020	Turbidity	84.5	50 NTU
37	5/20/2020	Turbidity	90.5	50 NTU
39	5/20/2020	Turbidity	73.7	50 NTU

June 2020 Upper Cape Fear Monitoring Data - WQS Violations				
UCFRBA Site #	**Date**	**Parameter**	**Reported Value**	**NC WQ Standard**
16	6/17/2020	Turbidity	53.1	50 NTU
17	6/17/2020	Turbidity	61.3	50 NTU
27	6/17/2020	Turbidity	88.3	50 NTU
41	6/17/2020	Turbidity	90.7	50 NTU
42	6/17/2020	Turbidity	82.6	50 NTU

April 2020 through June 2020 – Upper Cape Fear Data Notations/Corrections				
Parameter	**UCFRBA Site#**	**Date**	**Reported Value**	**Corrected Value**
Fecal Coliform	21	4/17/2020	38	45

OTHER DATA ISSUES AND CORRECTIONS
NOTE: As per the usual practice, every data point was reviewed for the 2nd Quarter of 2020.

Revision Date: July 22, 2020

Upper Cape Fear River Basin Association QA/QC Committee Report
From QA/QC Data Review Meeting of Wednesday, October 28, 2020

Reviewers: Chair: Dawn Molnar (High Point), Alicia Goots (City of Greensboro), Martie Groome (Greensboro)

Water Quality Standard (WQS) Exceedances July 2020 through September 2020

July 2020 Upper Cape Fear Monitoring Data - WQS Violations				
UCFRBA Site #	**Date**	**Parameter**	**Reported Value**	**NC WQ Standard**
4421	7/22/2020	Turbidity	93.2	50 NTU
21	7/22/2020	Dissolved Oxygen	3.9	≥4.0 mg/l
19	7/22/2020	Dissolved Oxygen	2.7	≥4.0 mg/l
19	7/2/2020	Dissolved Oxygen	3.6	≥4.0 mg/l

August 2020 Upper Cape Fear Monitoring Data – WQS Violations				
UCFRBA Site #	**Date**	**Parameter**	**Reported Value**	**NC WQ Standard**
19	8/26/2020	Dissolved Oxygen	3.8	≥4.0 mg/l
22	8/26/2020	Dissolved Oxygen	3.8	≥4.0 mg/l

September 2020 Upper Cape Fear Monitoring Data – WQS Violations				
UCFRBA Site #	**Date**	**Parameter**	**Reported Value**	**NC WQ Standard**
4	9/1/2020	Turbidity	52.7	50 NTU
9	9/1/2020	Turbidity	151	50 NTU
12	9/1/2020	Turbidity	111	50 NTU
13	9/1/2020	Turbidity	138	50 NTU
21	9/28/2020	Turbidity	67.5	50 NTU
43	9/29/2020	Chlorophyll a	44.4	40 µg/l

July 2020 through September 2020 – Upper Cape Fear Data Corrections/Notations				
Parameter	**UCFRBA Site#**	**Date**	**Reported Value**	**Corrected Value**
Total Phosphorus	28	7/8/2020	0.054 mg/l	0.056 mg/l

OTHER ISSUES and COMMENTS
NOTE: Since only 3 OA/QC committee members were present, all July and September data was reviewed, but only the August field data was reviewed.

Revision Date: November 2, 2020

Upper Cape Fear River Basin Association QA/QC Committee Report
From QA/QC Data Review Meeting of Tuesday, January 26, 2021

Reviewers: Chair: Dawn Molnar (High Point), Elaine Sellars (High Point), Alicia Goots (City of Greensboro), Martie Groome (City of Greensboro), Cameron Colvin (PTRC)

Water Quality Standard (WQS) Exceedances October 2020 through December 2020

October 2020 Upper Cape Fear Monitoring Data - WQS Violations				
UCFRBA Site #	**Date**	**Parameter**	**Reported Value**	**NC WQ Standard**
21	10/8/2020	Turbidity	69.1	50 NTU

November 2020 Upper Cape Fear Monitoring Data – WQS Violations				
UCFRBA Site #	**Date**	**Parameter**	**Reported Value**	**NC WQ Standard**
3	11/13/2020	Turbidity	66.9	50 NTU

December 2020 Upper Cape Fear Monitoring Data – WQS Violations				
UCFRBA Site #	**Date**	**Parameter**	**Reported Value**	**NC WQ Standard**
7	12/15/2020	Turbidity	63.6	50 NTU
9	12/15/2020	Turbidity	70.0	50 NTU
12	12/15/2020	Turbidity	83.4	50 NTU
13	12/15/2020	Turbidity	85.7	50 NTU
21	12/8/2020	Turbidity	73.9	50 NTU

October 2020 through December 2020 – Upper Cape Fear Data Notations/Corrections				
Parameter	**UCFRBA Site#**	**Date**	**Reported Value**	**Corrected Value**
Fecal	22	10/8/2020	320	340
Fecal	24	10/8/2020	210	205
Fecal	7	12/15/2020	473	743
Fecal	27	12/8/2020	1260	1200

OTHER ISSUES AND COMMENTS
N/A

Revision Date: January 26, 2021

APPENDIX F: NC DWR 2012 Metals Monitoring Suspension Letter

NCDENR

North Carolina Department of Environment and Natural Resources
Division of Water Quality

Beverly Eaves Perdue
Governor

Charles Wakild, P. E.
Director

Dee Freeman
Secretary

April 24, 2012

MEMORANDUM

To: Regional Surface Water Protection Supervisors
Jay Sauber
Kent Wiggins

From: Chuck Wakild

Subject: Routine Ambient Data Collection for Total Metals

On April 3, 2007, DWQ suspended routine collection and analysis of total recoverable metals in all ambient monitoring programs because metals monitoring practices and water quality standards were under review. Since that time, the suspension has been continued by the Division at the Director's discretion.

DWQ has made significant progress in the past few years evaluating assessment techniques, evaluation criteria and relevant water quality standards. The Division has received copious amounts of information and input on potential costs and benefits of proposed metals criteria from a variety of interested parties and is currently using that input to develop a Fiscal Note for certification by the Environmental Management Commission (EMC) and approval by the Office of State Budget Management (OSBM). It is the Division's goal to have the Fiscal Note completed for review by the EMC in the fall of 2012.

Pending EMC approval, the proposed rules, fiscal note and announcement of Public Hearing dates/public comment period will be noticed in the North Carolina Register. At that time, interested parties will again have a chance to provide input for final consideration of the rules. Upon final approval by the EMC and OSBM, the rules will be submitted to the Rules Review Commission. Pending completion of all state requirements, DWQ will submit the water quality standards revisions to the US EPA and request federal approval of the revised water quality standards.

The suspension of routine ambient data collection for total metals will continue for the Discharge Monitoring Coalitions. It is recommended that the Monitoring Coalitions take this time to evaluate how the proposed water quality standards will impact their sampling programs and continue to retain their financial resources in anticipation of future monitoring efforts. DWQ ambient metals sampling will continue as it has been performed for the past two years.

Questions regarding sampling or special studies should be directed to Jay Sauber (jay.sauber@ncdenr.gov; 919-743-8416). Questions on water quality standards for metals should be directed to Connie Brower (connie.brower@ncdenr.gov; 919-807-6416).

1617 Mail Service Center, Raleigh, North Carolina 27699-1617
Location: 512 N. Salisbury St. Raleigh, North Carolina 27604
Phone: 919-807-6300 \ FAX: 919-807-6492
Internet: www.ncwaterquality.org

APPENDIX G: UCFRBA Monitoring Services Contract

UPPER CAPE FEAR RIVER BASIN ASSOCIATION MONITORING SERVICES

BETWEEN UPPER CAPE FEAR RIVER BASIN ASSOCIATION, INC.
AND MERITECH, INC

This CONTRACT effective September 1, 2020 between the UPPER CAPE FEAR RIVER BASIN ASSOCIATION, INC., hereinafter called the ASSOCIATION, and MERITECH, INC., hereinafter called the CONTRACTOR.

WITNESSETH:

WHEREAS, on July 28, 2020 the Board of Directors of the Upper Cape Fear River Basin Association, Inc. authorized a new two-year monitoring services contract between the UPPER CAPE RIVER BASIN ASSOCIATION, INC and MERITECH, INC., such contract pending review and acceptance by the Board; and

WHEREAS, this CONTRACT is consistent with the Memorandum of Agreement (MOA) (EXHIBIT 1) between the Division of Water Resources, North Carolina Department of Environment and Natural Resources (NCDENR) and the ASSOCIATION for collection, analysis and reporting of water quality data for the period of May 1, 2020 to April 30, 2025; and

WHEREAS, CONTRACTOR attests that it is a fully certified laboratory approved by the Division of Water Resources, North Carolina Department of Environment and Natural Resources and that it shall maintain continuous laboratory certification with DWQ in accordance with 15 NCAC 2H.0800 for all contaminants and parameters required for data collection by the MOA; and

WHEREAS, the ASSOCIATION requires supplemental information related to sampling and analytical services to improve quality assurance and quality control in the testing and analysis process, such supplemental information detailed in EXHIBIT 2 of this CONTRACT;

NOW, THEREFORE, in consideration of the premises and the mutual covenants contained herein, the parties do hereby contract and agree as follows:

SECTION I. SCOPE OF WORK

The CONTRACTOR does hereby covenant and agree with the ASSOCIATION that the CONTRACTOR will well and faithfully perform and execute such work and furnish such labor, materials, equipment, apparatus and supplies, in accordance with each and every one of the conditions, covenants, stipulations, terms and provisions contained in this CONTRACT and as generally described below, and will well and faithfully comply with and perform each and every obligation imposed upon the CONTRACTOR under this CONTRACT.

The CONTRACTOR shall promptly make payments to all persons supplying materials in the prosecution of the work, and to all laborers and others employed thereon.

A. Type of Work

The work to be done and fully performed by the CONTRACTOR pursuant to this CONTRACT shall consist of the following:

1. Base Monitoring Services: Base Monitoring Services shall be those specified in the requirements of the MOA between the ASSOCIATION and the NCDWR, dated May 1 2020, in EXHIBIT 1. Additional quality assurance/quality control (hereafter QA/QC) requirements are specified in EXHIBIT 2. The Base Monitoring Services are summarized in general as the following items, defined as explained in the narrative following each item:

    a. Water sampling: The sampling sites listed in the MOA (Exhibit 1, Table 2 on page 9) shall be visited on the frequency specified in Table 2 on page 9 of the MOA by a qualified monitoring technician employed by CONTRACTOR. Water samples shall be field tested, collected, preserved, stored and transported by CONTRACTOR from each sampling site for analysis for the parameters required in Table 2 of the MOA for each sampling site, in accordance with the requirements specified in Appendix A and B of the MOA and the supplemental QA/QC measures specified in EXHIBIT 2. Also, CONTRACTOR will take field notes at each site using the field site sheet, example is found in EXHIBIT 4.

    b. Water sample analysis: CONTRACTOR shall collect and analyze water samples by methods approved by NCDWR to the detection limits required by NCDWR listed in MOA Appendix A and B and Supplemental Exhibit 2 for each parameter found in Table 2. The analysis must be performed using the protocols included in NCDWR' s "Standard Operating Procedures Manual, Physical and Chemical Monitoring", 40 CFR Part 136 and 15 NCAC 2B.0505(e)(4), Standard Methods, unless otherwise specified in this contract.

    c. Water sample analysis reporting to the ASSOCIATION: The results of all of the water sample analyses from all of the sampling sites shall be reported to the ASSOCIATION'S members by means of emailing spreadsheets electronically on the form approved by the ASSOCIATION in EXHIBIT 3. These reports shall be distributed by email as soon as the analysis results are available (unless otherwise specified by the ASSOCIATION, not less frequently than monthly. CONTRACTOR will provide paper copies of field note sheets for every sampling site, monthly. The water quality monitoring results and data for each month shall be reported by the CONTRACTOR to the ASSOCIATION by the end of the following month.

    d. Water sample analysis reporting to NCDWR: The ASSOCIATION shall be responsible for immediately contacting NCDWR to finalize arrangements for reporting the required data. Normally, a committee of the ASSOCIATION shall review the analysis for the QA/QC measures specified in EXHIBIT 2 before the data is reported to NCDWR.

    e. Data collection or analysis errors: CONTRACTOR agrees to promptly notify the specified representatives of the ASSOCIATION in the event any samples are not collected or analyzed as required in the MOA and this contract, and to give a general reason and description of follow-up action, not later than 21 days after the scheduled sample collection date.

f. Instream monitoring: Samples shall be collected at as close to mid-stream as possible.

g. Same day monitoring: Sample stations in each sub-basin (as identified in Appendix A-1 shall be monitored on the same day.

h. Frequency: Monitoring must be done at the frequency specified in Appendix A-1 of the MOA.

i. Annual certification report: CONTRACTOR shall prepare and submit to the ASSOCIATION'S members and NCDWQ an annual (calendar year) certification report that confirms the amount of the prescribed work completed by CONTRACTOR. The narrative report must be submitted by February 28th of the following year. The report must identify the number of water samples that were not collected, analyzed and/or reported as required pursuant to the MOA and all data that was qualified.

2. Additional Monitoring Services

Upon mutual agreement of the ASSOCIATION and CONTRACTOR, this CONTRACT may be amended to include additional monitoring services that are determined desirable by the ASSOCIATION. MERITECH shall have sixty (60) days to respond to any changes in monitoring services before the CONTRACT is amended.

SECTION II. TERM OF AGREEMENT

The term of this CONTRACT is for three years from September 1, 2020 through August 31, 2023.

SECTION III. COMPENSATION

1. Amount due: The ASSOCIATION hereby covenants and agrees that the ASSOCIATION shall pay the CONTRACTOR, when due and payable under the following terms for the performance of the services described in Section I(A) as follows:

Contract Cost Breakdown

Vehicle /Miles	12390 miles X .57/ mile=	$7,062.00
Labor/ Technicians	495 hrs	
Management	200 hrs	
Reporting	300 hrs	
Field & admin Costs	995 hrs @ $39.73/ hr ave.	$39,571.00
		$46,633.00
Analysis		$46,080.00
Equipment		$3,000.00
Total/year 2020-2023		**$95,713.00**

- *Field sampling events include pH, Temperature, DO and Conductivity at the surface of sampling site.*

Analytical Costs

Test	Reporting Limit *(mg/L)*	Method	Quantity/ Year	Cost Per Test	Cost Per Year
Total Suspended Solids	1	SM 2540D	480	$9.00	$4,320.00
Ammonia, Nitrogen	0.1	EPA 350.1	480	$12.00	$5,760.00
TKN	0.20	EPA 351.1	480	$21.00	$10,080.00
Nitrate/Nitrite, Nitrogen	0.10	EPA 353.2	480	$15.00	$7,200.00
Phosphorus, total	0.020	EPA 200.7	480	$12.00	$5,760.00
Fecal Coliform	1 col/100 ml	SM 9222D	480	$17.00	$8,160.00
Turbidity	1.0 NTU	EPA 180.1	480	$10.00	$4,800.00
TOTAL	-	-			$46,080.00

Year	% Increase	Annual Cost
September 2020 - August 2021	-	$95,713.00
September 2021 - August 2022	2 %	$97,627.26
September 2022 - August 2023	2 %	$99,579.80

Additional Services Special studies

Additional sampling at Stations B4800000 (UCF #34) and Station B5950000 (UCF #43) to continue through December 2020.

Additional $560/month (invoiced separately) for the first 4 months of the contract
$2,240 total

2. Payment requests: CONTRACTOR shall be eligible to submit monthly payment requests for a portion of the lump sum CONTRACT amount, provided for in the CONTRACT award notice. Payment requests shall not be submitted more frequently than monthly.

3. Payment by ASSOCIATION: ASSOCIATION shall pay CONTRACTOR'S invoice within thirty (30) days of QA/QC verification (via on-site meeting or reviewing spreadsheets via email) by the ASSOCIATION.

4. Reimbursement by CONTRACTOR: The ASSOCIATION shall not be required to pay CONTRACTOR for any unreportable or invalid data that does not meet the requirements of this CONTRACT. In the event of a disputed or contested billing, only that portion so contested will be withheld from payment, and the undisputed portion will be paid. In the event the ASSOCIATION has paid for monitoring services and data that are later determined to be unreportable or invalid, the CONTRACTOR shall promptly reimburse the ASSOCIATION for the cost of said monitoring. In such an event, the party discovering such invalid data shall promptly notify the other party of such unreportable or invalid data, and the CONTRACTOR shall reimburse the ASSOCIATION within 30 days of such notification.

SECTION IV. LIABILITY AND INDEMNIFICATION

1. Indemnification by CONTRACTOR: CONTRACTOR agrees to indemnify ASSOCIATION from any claims, damages, losses, and costs, including, but not limited to, reasonable attorney's fees and litigation costs, arising out of claims by third parties for property damage and bodily injury, including death, caused by the negligence or willful misconduct of the CONTRACTOR, CONTRACTOR' S employees, affiliated corporations, officers, agents and subcontractors in connection with the CONTRACT.

2. Indemnification by ASSOCIATION: ASSOCIATION agrees to indemnify CONTRACTOR from any claims, damages, losses, and costs, including, but not limited to, reasonable attorney's fees and litigation costs, arising out of claims by third parties for property damage and bodily injury, including death to the proportionate extent, caused by the negligence or willful misconduct of the ASSOCIATION, the ASSOCIATION'S employees, or agents in connection with the CONTRACT.

3. Proportionate Indemnification: If the negligence or willful misconduct of both ASSOCIATION and CONTRACTOR (or a person identified above for whom each is liable) is a cause of such damage or injury, the loss, cost, or expense shall be shared between the ASSOCIATION and CONTRACTOR in proportion to their relative degrees of negligence or willful misconduct and the right of indemnity shall apply for such proportion.

SECTION V. COMPLIANCE WITH LAWS

CONTRACTOR agrees that in performing the required services, CONTRACTOR will comply with applicable regulatory requirements including federal, state and local laws, rules, regulations, orders, codes, criteria and standards.

SECTION VI. CONTRACTOR'S INSURANCE

During the performance of this CONTRACT, the CONTRACTOR shall maintain the following insurance:

a. Comprehensive General Liability Insurance with bodily injury limits of not less than $1,000,000 for each occurrence and not less than $1,000,000 in the aggregate, and with property damage limits of not less than $100,000 for each occurrence and not less than $1,000,000 in the aggregate.

b. Automobile Liability Insurance with a combined single limit of not less than $1,000,000 for each accident.

c. Worker's Compensation Insurance in accordance with statutory requirements and Employers' Liability Insurance with limits of not less than $100,000 for each accident.

d. Professional Liability Insurance with limits of not less than $1,000,000 annual aggregate.

e. The CONTRACTOR shall name the ASSOCIATION as an additional insured on the policy.

SECTION VII. ASSOCIATION'S RESPONSIBILITIES

The ASSOCIATION shall be responsible for the following:

a. Approve all procedures established to govern the relationship among the ASSOCIATION, CONTRACTOR, and third parties.

b. Provide designated personnel to represent the ASSOCIATION in matters involving the CONTRACTOR.

c. Payment of invoices for services in accordance with Section III.

SECTION VIII. TERMINATION OF CONTRACT FOR CAUSE

In the event of failure by the CONTRACTOR to perform in accordance with the terms of this CONTRACT, ASSOCIATION shall have the right to terminate the CONTRACT upon *14* days written notice to the CONTRACTOR, in which event CONTRACTOR shall have neither the obligation nor the right to perform further services under this CONTRACT.

SECTION IX. UNCONTROLLABLE FORCES

Neither CONTRACTOR nor the ASSOCIATION shall be considered to be in default of the provisions of this CONTRACT if delays in or failure of performance shall be due to uncontrollable forces. The term "uncontrollable forces" shall mean any event that results in the prevention or delay of performance by a party, and that is beyond the control of the non-performing party. The term "uncontrollable forces" includes, but is not limited to, fire, acts of God, flood, earthquakes, major storms, lightning, epidemic, war, riot, and civil disturbance.

SECTION X. GOVERNING LAW

The laws of the State of North Carolina shall govern this CONTRACT.

SECTION XI. ASSIGNMENT

The CONTRACTOR shall not assign, sublet or transfer any rights under or interest in this CONTRACT, including monies that are or may become due. Provided, however, for a period of 90 days from the initial date of this CONTRACT and upon written notice to the ASSOCIATION, CONTRACTOR may assign and transfer any rights under or interest in this Contract, including monies that are or may become due, to a purchaser of substantially all of the assets of CONTRACTOR without the prior consent, written or oral, of the OWNER. Nothing contained in this paragraph shall prevent the CONTRACTOR from employing such independent consultants, associates or subcontractors, as it may deem appropriate to assist the CONTRACTOR in the performance of the services rendered.

Upper Cape Fear River Basin Association

By: Charles Cocker
Charles Cocker, UCFRBA Chairman

Date: AUG. 4, 2020

ATTEST
Cameron Colvin
Secretary

Meritech, Inc

By: B R Merritt

Date: 8/4/2020

ATTEST

David Merritt, Vice President Meritech, Inc.