Upper Cape Fear River Basin Association (UCFRBA)

UCFRBA 2018 Annual Report

Prepared for NC Division of Water Resources

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UCFRBA 2018 Annual Report

Table of Contents

Background

The Upper Cape Fear River Basin Association (UCFRBA) was created as a non-profit organization in February of 2000. It was the last basin association to be formed in the Cape Fear River Basin. The Upper Cape Fear River Basin includes more than 10 counties and 30 municipalities, and nearly 150 permitted wastewater discharge facilities. The permitted wastewater discharges total more than 140 million gallons per day (MGD). Long-term water resources planning, management and protection in this rapidly growing 3,100 square mile area are challenging and complex tasks. To meet these increasing challenges, 20 parties comprising local governments (with planning and zoning jurisdiction and wastewater treatment plants) and private companies joined together to establish the UCFRBA. The UCFRBA currently has 18 members representing public and private sector entities who rely upon the river for wastewater discharge.

In concert with the Middle and Lower Basin Programs, the Upper Basin has implemented a comprehensive water quality monitoring program in exchange for a waiver of the ambient monitoring requirements in the Association members' individual **National Pollutant Discharge Elimination System** (NPDES) permits. The Association signed a Memorandum of Agreement (MOA) with the North Carolina Division of Water Resources (NCDWR) binding its members to participate in the monitoring program. The monitoring program started in April 2000. The coalition has since renewed their MOA with NCDWR every five years in 2005, 2010, and 2015.

In addition to its monitoring program, the UCFRBA provides an ongoing forum for interested parties to work together on water resources 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. Geographically, the headwaters of the Haw River and Deep River start west of Greensboro in Forsyth County and come together below Jordan Lake to form the Cape Fear River (Figure 1).

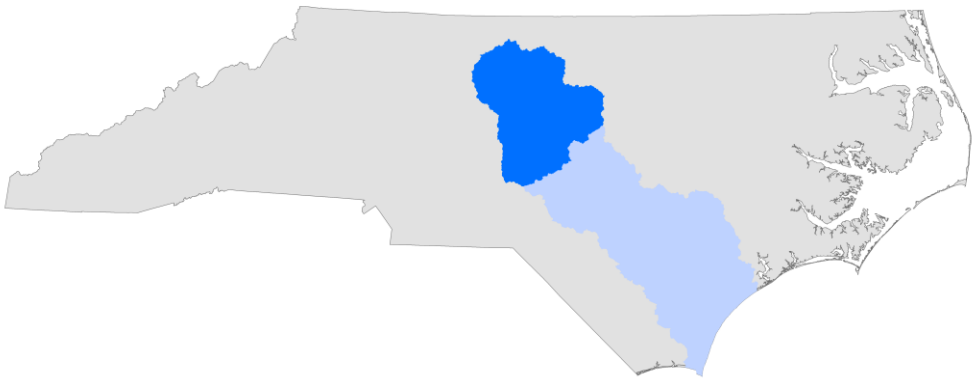
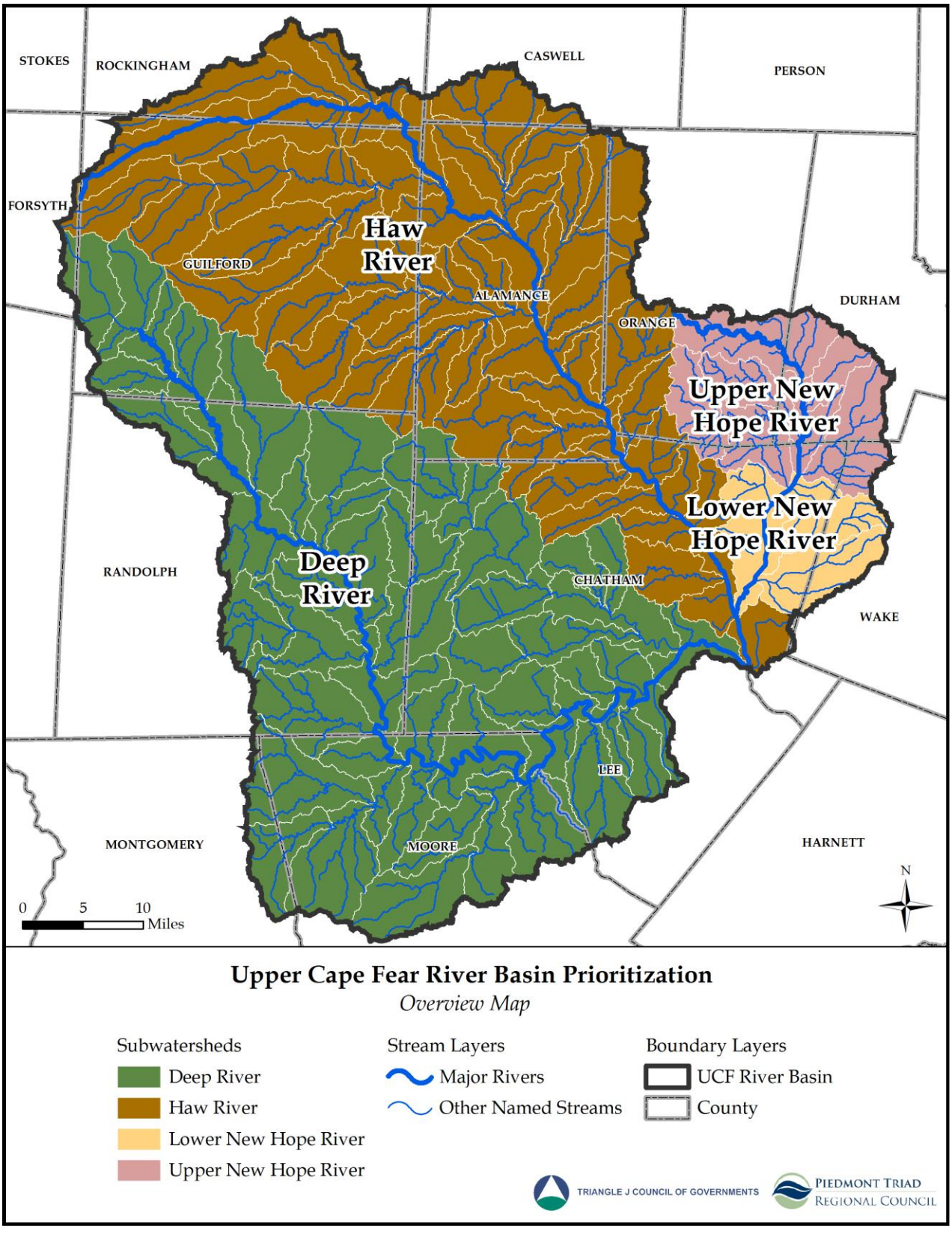


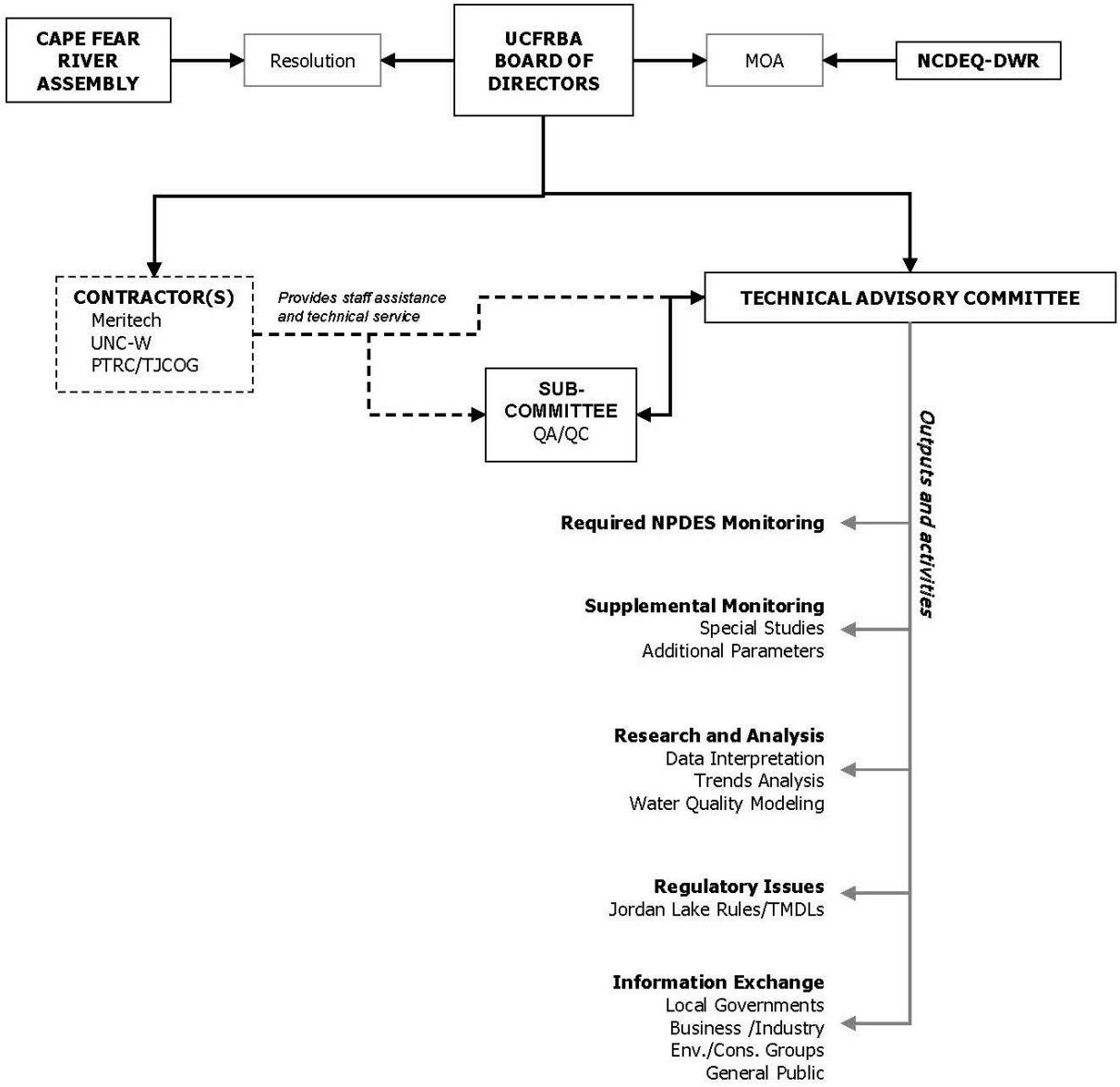
Figure 1: Upper Cape Fear River Basin

Laboratory services are currently provided by Meritech Inc., located in Reidsville, NC. Meritech, Inc. has provided these services since 2005. SimaLabs, Inc., was the Association's laboratory for conducting stream monitoring and analyses until August 2004.

The Triangle J Council of Governments (TJCOG) and Piedmont Triad Regional Council (PTRC) provide administrative staff support for the UCFRBA. All current information, including water quality data, organizational documents, and meeting materials is maintained on the UCFRBA's dedicated website: http://www.ptrc.org/ucfrba.


STOKES
ROCKINGHAM
CASWELL
PERSON
FORSYTH
Haw River
GUILFORD
ALAMANCE
DURHAM
ORANGE
Upper New Hope River
Lower New Hope River
Deep River
RANDOLPH
CHATHAM
WAKE
LEE
MONTGOMERY
MOORE
HARNETT
N
0 5 10 Miles
Upper Cape Fear River Basin Prioritization
Overview Map
Subwatersheds
Deep River
Haw River
Lower New Hope River
Upper New Hope River
Stream Layers
Major Rivers
Other Named Streams
Boundary Layers
UCF River Basin
County
TRIANGLE J COUNCIL OF GOVERNMENTS
PIEDMONT TRIAD REGIONAL COUNCIL

Organizational Structure



Board of Directors

The UCFRBA is governed by a Board of Directors composed of its corporate members. The corporate membership is comprised of 18 local governments and industries using the UCFRB for water supply or treating and discharging wastewater within the UCFRB. 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. Each corporate member has the authority to appoint one Director and one Alternate Director to the Board of Directors.

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.

Corporate Members	Discharger	Public Water System	Representatives		NPDES Permit Number(s)
Arclin	Yes	No	Bowman Harvey	Brad Crawford	NC0000892
Asheboro	Yes	Yes	Michael Rhoney	John Ogburn II	NC0026123
Burlington	Yes	Yes	Bob Patterson	Eric Davis	NC0023868, NC0023876
Cary	No	Yes	Jeff Adkins	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	Sandra Bradshaw	Monica Dodson	NC0025241
Pilgrim's Pride	Yes	No	Tina Pedley	VACANT	NC0072575, NC0083852
Pittsboro	Yes	Yes	Bryan Gruesbeck	Cindy Perry	NC0020354
Ramseur	Yes	Yes	Terry Lewallen	Danny Shaw	NC0026565
Randleman	Yes	Yes	Michael Glass	Zack Hewett	NC0025445
Reidsville	Yes	Yes	Chuck Smith	Preston Mitchell	NC0024881
Sanford	Yes	Yes	Victor Czar	Scott Siletzky	NC0024147
Siler City	Yes	Yes	Bryan Thompson	VACANT	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 next officer elections will occur in 2020.

Officers of the Board of Directors

Chairman:	*Michael Rhoney, City of Asheboro*
Vice-Chairman:	*Charles Cocker, City of Durham*

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. The TAC meets quarterly, usually on the fourth Tuesday of the month from 9:30am-11:00am in Mebane, NC. TAC committee members are listed 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 data and ensures the data are accurate and reliable. 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*
Glenn McGirt	*City of Burlington*
Amanda Hancock	*Meritech, Inc.*
Cameron Colvin, Staff Support	*PTRC*

Summary of Monitoring Program

The UCFRBA renewed its Memorandum of Agreement (MOA) and contract with the NCDWR in May 2015 in order to comply with the federal NPDES program. The MOA applies to the five-year permit cycle of 2015 – 2020, and is available in full upon request, as well as on the coalition's website. The MOA was negotiated so that the UCFRBA currently monitors a network of thirty-nine (39) monitoring stations in the Upper Cape Fear River Basin. Since that time, one site in Durham County (B3300000) was eliminated from the UCFRBA's monitoring responsibilities on behalf of its members. See Appendix A for a summary of data collected in 2018 for each station.

This year, the UCFRBA will begin reviewing its monitoring program in anticipation of the renewal of its MOA contract with the NCDWR for 2020-2025. Recent changes in the basin, such the City of Greensboro's closure of its wastewater treatment plant at North Buffalo Creek (NC0024325), may affect the coalition's monitoring requirements. Any potential changes to the UCFRBA's monitoring program will be negotiated with the NCDWR over the next year.

Through 2007, metals were collected quarterly using Clean Hands/Dirty Hands methodology (a modified version of EPA Method 1669; see Appendix D). Low-level mercury was analyzed using EPA Method 1631 at 7 sites. In April 2007, NC DWR released a memo suspending the metals monitoring requirement in the Memorandums of Agreement with the NPDES discharger monitoring coalitions while DWQ re-evaluates new approaches regarding metals data and the use of water quality standards and criteria for metal. A memo from NC DWR Director Chuck Wakild was issued to the Surface Water Protection Program on April 24, 2012. This letter was relayed to all monitoring coalitions. June 2007 was the last month of metals testing – including mercury –conducted by the UCFRBA within the Upper Cape Fear River Basin. Please see Appendix E for the 2012 NCDWQ memo regarding the suspension of metals monitoring, and the acknowledgement of the Association's permission to not monitor until this state-level suspension ends.

The UCFRBA contracts with UNC-Wilmington to maintain an online database of all of its approved water quality data. This database also houses water quality data for the Middle and Lower Cape Fear monitoring coalitions. Data is provided to UNC-W staff annually and is accessible to the public at this website: http://lcfrp.uncw.edu/riverdatabase/. All data collected by the UCFRBA under its MOA with NC DWR may be accessed, analyzed, and downloaded from this website. Data may also be requested directly by contacting either of the UCFRBA's administrative staff:

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Table 1: UCFRBA Water Quality Monitoring Stations

DWQ Station Number	Location	Station Comments	Latitude (dd.ddddd)	Longitude (dd.ddddd)	County	Stream Class	Stream Index	Sub-Basin	[1]Field Parameters	Fecal Coliform	Turbidity	TSS	[2]Nutrients	[3]Metals
B0050000	Haw Riv at US 29 Business nr Benaja	ups Reidsville WWTP	36.2652	-79.6523	ROCKINGHAM	WS-V, 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	WS-V, NSW	16-6-(3)	03-06-01	M	M	M	M	M	
B0170000	Haw Riv at SR 2620/2614 (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	WS-V, 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	WS-V, 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	WS-V, 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	WS-V, NSW	16-11-14-2	03-06-02	M + 2SM	M	M	M	M	
B1020000	Haw River at SR 1700 (Lower Hopedale Rd.) at Hopedale	ups Burlington East WWTP	36.1247	-79.4083	ALAMANCE	WS-V, NSW	16-(1)	03-06-02	M + 2SM	M	M	M	M	
B1200000	Haw Riv at NC 54 nr Graham	Between Burlington East and Graham	36.0481	-79.3667	ALAMANCE	WS-V, NSW	16-(1)	03-06-02	M + 2SM	M	M	M	M	
B1350000	Moadams Crk at Corrigdor Rd ups of Discharge nr Mebane	ups Mebane WWTP	36.0885	-79.2844	ALAMANCE	WS-V, NSW	16-18-7	03-06-02	M + 2SM	M	M	M		
B1380000	Moadams Crk at SR 1940 (Gibson Rd) nr Florence Town	dns Mebane WWTP	36.0891	-79.3074	ALAMANCE	WS-V, 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	WS-V, 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	WS-V, 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., DWQ ambient stn	35.7716	-79.1449	CHATHAM	WS-IV, NSW	16-(28.5)	03-06-04	M	M	M	M	M	
B3020000	New Hope Creek 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	
B3040000	New Hope Crk at SR 1107 (Stagecoach Rd) nr Blands	Jordan Lake TMDL, USGS gage	35.8847	-78.9656	DURHAM	WS-IV, NSW	16-41-1-(11.5)	03-06-05	M + 2SM	M	M	M	M	

DWQ Station Number	Location	Station Comments	Latitude (dd.ddddd)	Longitude (dd.ddddd)	County	Stream Class	Stream Index	Sub-Basin	[1]Field Parameters	Fecal Coliform	Turbidity	TSS	[2]Nutrients	[3]Metals
B3300000	Northeast Crk at SR 1102 (Sedwick Rd) nr RTP	ups Durham Co. RTP WWTP	35.887	-78.8994	DURHAM	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, DWQ ambient stn	35.8612	-79.01	CHATHAM	WS-IV, NSW	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 Jordan Lake and Performance Fibers, ups Arclin (Dynea)	35.6164	-79.0569	CHATHAM	WS-IV	16-42	03-06-04	M + 2SM	M	M	M	M	
B4350000	Deep Riv at SR 1113 (Kivett Dr) nr Hayworth Spring	ups Richland Creek	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 Highpoint	ups High Point Eastside WWTP, Fecal Coliform TMDL	35.941	-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	35.89579	-79.91951	RANDOLPH	WS-IV*	17-9-(1)	03-06-08	M	M	M	M	M	
B4770500	Deep Riv at Bus 220 (Main St) at Randleman	ups Randleman WWTP, ups Hasketts Creek	35.8233	-79.8033	RANDOLPH	C	17-(10.5)	03-06-08	M + 2SM	M	M	M	M	
B4800000	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	Hasketts 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 CreeK	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 Starr 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	35.5782	-79.1942	LEE	C	17-(38.7)	03-06-11	M + 2SM	M	M	M	M	
B5950000	Rocky Riv at US 64 nr Siler City	dns reservoir, ups Loves Creek	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 Loves Creek	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, DWQ ambient stn	35.6176	-79.0912	CHATHAM	WS-IV	17-(43.5)	03-06-11	M	M	M	M	M	

DWQ Station Number	Location	Station Comments	Latitude (dd.ddddd)	Longitude (dd.ddddd)	County	Stream Class	Stream Index	Sub-Basin	[1]Field Parameters	Fecal Coliform	Turbidity	TSS	[2]Nutrients	[3]Metals
B5890000	Loves Crk at Water Treatment Plant Rd at Siler City	Siler City WWTP Sampling Program	35.7298	-79.4289	CHATHAM	C	17-(43)-10	03-06-12	M + 2SM	M	M		M	
B5920000	Loves Creek at Progress Blvd at Siler City	Siler City WWTP Sampling Program	35.7322	-79.4246	CHATHAM	C	17-(43)-10	03-06-12	M + 2SM	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 expects to 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 decommissioned its North Buffalo Creek WWTP in December 2017. The UCFRBA is beginning discussions on how this may impact this sampling site.

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 9222D
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)

Certified Laboratories & Quality Assurance/Quality Control Issues

In May 2018, a final 10.0 Turbidity check standard was not completed. This only affected data collected from sites B3020000, B3040000, B3670000, B3025000, B3899180, & B3900000 on May 22nd, 2018.

In September 2018, Meritech, Inc. had to replace its inductively coupled plasma mass spectrometer (ICP-MS). To ensure that samples were run within the hold time, phosphorus samples for this month were run using Method 200.7 rather than 200.8, which has the same detection limit of 0.02 mg/l. In addition, several sampling sites were inaccessible during the month of September as a result of extensive flooding caused by Hurricane Florence. These sites included B2100000, B3040000, B4080000, B5685000, B5820000, B5950000, B5980000, B5890000, and B5920000. Per NCDWR's request, the dates that sample collections were attempted have been documented in September's data spreadsheet. Site B5685000 was also inaccessible on October 10, 2018 due to weather conditions.

Other notation errors identified by the UCFRBA's QA/QC subcommittee were reported to Meritech, Inc. and corrected prior to submittal to NCDWR.

2018 UCFRBA Issues

The following are topics that occupied significant UCFRBA staff and members' time in 2018. No special studies were conducted for 2018.

DWR Nutrient and Dissolved Oxygen Model

The Division of Water Resources Modeling and Assessment Branch is in the process of 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) in order to better inform nutrient permitting throughout the basin. The branch has requested that the Upper and Middle Cape Fear monitoring coalitions increase water quality monitoring at certain sampling locations for a two-year period. The data to be collected will help reduce uncertainties and increase confidence in model predictions.

Over the course of the past year, the UCFRBA dedicated significant time and resources toward this effort. Members from the DWR's Modeling and Assessment Branch attended two UCFRBA meetings in order to present on and discuss the proposed monitoring plan. The UCFRBA also helped coordinate meetings between the DWR, Middle Cape Fear River Basin Association, and Meritech, Inc. to discuss additional parameters, costs, potential funding options, sampling and data sharing logistics. In June 2018, the UCFRBA Board voted to increase monitoring efforts in order to support the DWR's modeling efforts. Additional sampling will occur from January 2019 through December 2020 at sites B4800000 and B5950000 and will affect the following parameters: nutrients, turbidity, suspended residue, chlorophyll *a*, orthophosphates, total organic carbon, and short and long-term BODs.

Emerging Contaminants

Gen-X and other perfluorinated chemicals (PFCs) have gained increasing attention in North Carolina and the Cape Fear River Basin as a result of recent studies surrounding the Chemours factory in Fayetteville, NC. Several UCFRBA member communities have begun working to preemptively address these emerging contaminants. This year the UCFRBA has been engaged in several presentations and discussions about PFCs and the effectiveness of certain removal technologies.

NC DWR/Meritech Field Visit

On June 11, 2018, NC DWR employee David Huffman accompanied Meritech, Inc., employee Wesley Yance to review his field sampling procedures and ensure compliance with the MOA signed by the UCFRBA with NC DWR. DWR stated that Mr. Yance collected and stored data in a matter that would result in "quality samples" and had no significant concerns with his methods or behaviors in the field. All data collection procedures were within compliance of the MOA (see Appendix H for a copy of the letter).

Officer Elections

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

APPENDIX A: UCFRBA Station Summaries

01/01/2018-12/31/2018 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	0.7	29	18.17	20.2	9.68
pH(su)	12	0	6~9	1	5.8	7.2	6.76	6.8	0.37
Diss. Oxy.(mg/L)	12	0	4	0	4	11.8	7.91	7.8	2.53
Conductivity(umhos/cm)	12	0	NA	0	56	145	72.67	65	24.38
Fecal Coliform(col/100ml)	12	0	400	2	2	800	33.52*	19	256.65
Lab Turbidity(NTU)	12	0	50	0	6.1	20.6	10.45	9.3	4.06
TSS(mg/L)	12	0	NA	0	4	10	7.25	7.5	1.82
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	2	NA	0	0.01	0.28	0.1	0.08	0.08
TKN-N(mg/L)	12	0	NA	0	0.45	1.79	1.05	0.98	0.45
NO2-NO3(mg/L)	12	1	NA	0	0.01	0.24	0.14	0.14	0.07
T. Phos.(mg/L)	12	7	NA	0	0.01	0.03	0.02	0.01	0.01
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.)

01/01/2018-12/31/2018 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	0.1	27.1	18.42	22.3	7.84
pH(su)	17	0	6~9	0	6.2	7.1	6.81	6.8	0.24
Diss. Oxy.(mg/L)	17	0	4	0	5.7	11.9	7.57	6.6	1.84
Conductivity(umhos/cm)	17	0	NA	0	59	129	101.29	102	19.37
Fecal Coliform(col/100ml)	12	0	400	**2**	26	2400	128.37*	100	666.93
Lab Turbidity(NTU)	12	0	50	**2**	6.2	62.5	20.04	12.9	19.29
TSS(mg/L)	12	**1**	NA	0	1.25	26.5	8.23	5	8.35
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	**8**	NA	0	0.01	0.06	0.02	0.01	0.02
TKN-N(mg/L)	12	**1**	NA	0	0.1	1.27	0.74	0.76	0.34
NO2-NO3(mg/L)	12	**1**	NA	0	0.01	0.33	0.15	0.14	0.09
T. Phos.(mg/L)	12	**2**	NA	0	0.01	0.23	0.05	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.)

01/01/2018-12/31/2018 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	0.1	27.2	18.51	22.8	8.19
pH(su)	17	0	6~9	0	6.4	7.5	7.03	7.1	0.27
Diss. Oxy.(mg/L)	17	0	4	0	6.1	12.8	8.25	7.3	1.94
Conductivity(umhos/cm)	17	0	NA	0	73	445	148.24	123	88.82
Fecal Coliform(col/100ml)	12	0	400	**2**	38	6000	152.31*	119	1694.67
Lab Turbidity(NTU)	12	0	50	**2**	4.9	272	38.87	14.35	74.86
TSS(mg/L)	12	0	NA	0	3	120	20.5	10	32.4
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	**8**	NA	0	0.01	0.05	0.02	0.01	0.01
TKN-N(mg/L)	12	0	NA	0	0.5	1.4	0.97	0.95	0.31
NO2-NO3(mg/L)	12	0	NA	0	0.06	1.41	0.41	0.31	0.34
T. Phos.(mg/L)	12	0	NA	0	0.03	0.41	0.11	0.06	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.)

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01/01/2018-12/31/2018 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	5.2	26.4	17.24	16.6	7.81
pH(su)	12	0	6~9	0	6.6	7.2	6.92	6.9	0.17
Diss. Oxy.(mg/L)	12	0	4	0	6.3	12.1	8.81	8.75	1.87
Conductivity(umhos/cm)	12	0	NA	0	65	1119	192.5	100	295.91
Fecal Coliform(col/100ml)	12	0	400	**2**	12	1600	95.47*	66.5	559.09
Lab Turbidity(NTU)	12	0	50	**1**	2.5	78.9	17.62	11.45	20.24
TSS(mg/L)	12	**2**	NA	0	1.25	36	10.38	7.5	9.75
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	**3**	NA	0	0.01	0.27	0.06	0.04	0.07
TKN-N(mg/L)	12	0	NA	0	0.56	2.32	1.05	0.89	0.56
NO2-NO3(mg/L)	12	0	NA	0	0.03	0.34	0.17	0.17	0.1
T. Phos.(mg/L)	12	**6**	NA	0	0.01	0.05	0.02	0.02	0.01
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.)

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

01/01/2018-12/31/2018 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	5.1	27.7	19.1	22.9	7.03
pH(su)	17	0	6~9	0	6.7	7.4	7.14	7.2	0.23
Diss. Oxy.(mg/L)	17	0	4	0	5.9	12.2	8.19	6.9	2.06
Conductivity(umhos/cm)	17	1	NA	0	23.5	381	208.5	205	86.52
Fecal Coliform(col/100ml)	12	0	400	4	25	3000	271.25*	225	1062.21
Lab Turbidity(NTU)	12	0	50	0	3.1	11.1	6.23	6.4	2.52
TSS(mg/L)	12	5	NA	0	1.25	14	3.95	3	3.89
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	7	NA	0	0.01	0.1	0.03	0.01	0.03
TKN-N(mg/L)	12	0	NA	0	0.65	1.73	0.89	0.8	0.31
NO2-NO3(mg/L)	12	0	NA	0	0.13	1.05	0.46	0.4	0.3
T. Phos.(mg/L)	12	0	NA	0	0.04	0.1	0.07	0.07	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.)
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01/01/2018-12/31/2018 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	4.5	27.9	18.81	22.7	7.23
pH(su)	17	0	6~9	0	6.6	7.6	7.13	7.2	0.25
Diss. Oxy.(mg/L)	17	0	4	0	6.1	12	8.4	7.9	1.79
Conductivity(umhos/cm)	17	0	NA	0	107	406	209.06	215	75.13
Fecal Coliform(col/100ml)	12	0	400	**5**	34	12000	391.08*	235	3494.47
Lab Turbidity(NTU)	12	0	50	0	2.6	20.8	10.07	9.5	5.99
TSS(mg/L)	12	**4**	NA	0	1.25	14	5.75	4	4.82
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	**4**	NA	0	0.01	0.15	0.04	0.04	0.04
TKN-N(mg/L)	12	0	NA	0	0.64	1.66	0.96	0.91	0.27
NO2-NO3(mg/L)	12	0	NA	0	0.27	1	0.51	0.39	0.25
T. Phos.(mg/L)	12	0	NA	0	0.04	0.1	0.07	0.07	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.)

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01/01/2018-12/31/2018 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)	17	0	32	0	4.8	27.1	18.51	23	7.82
pH(su)	17	0	6~9	0	6.9	8	7.27	7.3	0.29
Diss. Oxy.(mg/L)	17	0	4	0	6.4	12.1	8.66	7.5	2.13
Conductivity(umhos/cm)	17	0	NA	0	107	650	250	227	116.66
Fecal Coliform(col/100ml)	12	0	400	**2**	35	8200	189.37*	162	2318.47
Lab Turbidity(NTU)	12	0	50	0	3.3	29	9.75	6.9	7.59
TSS(mg/L)	12	**4**	NA	0	1.25	31	6.42	3	8.77
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	**8**	NA	0	0.01	0.08	0.02	0.01	0.02
TKN-N(mg/L)	12	0	NA	0	0.48	1.96	0.85	0.8	0.41
NO2-NO3(mg/L)	12	0	NA	0	0.05	0.76	0.34	0.3	0.23
T. Phos.(mg/L)	12	0	NA	0	0.03	0.1	0.06	0.05	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.)

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01/01/2018-12/31/2018 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	**1**	6	32.3	19.88	23.9	7.79
pH(su)	17	0	6~9	0	6.7	8.5	7.48	7.5	0.42
Diss. Oxy.(mg/L)	17	0	4	0	7.4	12.4	8.96	8.6	1.53
Conductivity(umhos/cm)	17	0	NA	0	85	502	240.65	227	128.21
Fecal Coliform(col/100ml)	12	0	400	**4**	18	6600	189.13*	138	1850.45
Lab Turbidity(NTU)	12	0	50	**2**	2.9	219	36.12	16.9	59.54
TSS(mg/L)	12	0	NA	0	3.3	118	22.69	11	31.27
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	**4**	NA	0	0.01	0.24	0.05	0.03	0.07
TKN-N(mg/L)	12	0	NA	0	0.64	2.48	1.34	1.16	0.55
NO2-NO3(mg/L)	12	0	NA	0	0.32	6.43	1.6	1.1	1.72
T. Phos.(mg/L)	12	0	NA	0	0.06	0.58	0.16	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.)

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

01/01/2018-12/31/2018 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	3.5	28	17.75	21.1	7.36
pH(su)	17	0	6~9	0	6.6	6.9	6.8	6.9	0.12
Diss. Oxy.(mg/L)	17	0	4	0	5	11.2	7.17	6.5	1.7
Conductivity(umhos/cm)	17	0	NA	0	112	200	161	160	20.85
Fecal Coliform(col/100ml)	12	0	400	**3**	76	1400	238.45*	205	485.32
Lab Turbidity(NTU)	12	0	50	0	7.5	27.4	16.59	13.85	7.09
TSS(mg/L)	12	0	NA	0	5	21	10.42	8	5.2
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	**4**	NA	0	0.01	0.17	0.06	0.04	0.06
TKN-N(mg/L)	12	0	NA	0	0.47	1.76	0.88	0.66	0.45
NO2-NO3(mg/L)	12	0	NA	0	0.2	0.99	0.52	0.46	0.25
T. Phos.(mg/L)	12	**3**	NA	0	0.01	0.05	0.03	0.03	0.01
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.)
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(*** Standard Deviation range of values is also affected by climate and storm events and etc.)

01/01/2018-12/31/2018 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	5	27.6	18.78	22.4	7.03
pH(su)	17	0	6~9	0	6.8	7.3	7.16	7.2	0.14
Diss. Oxy.(mg/L)	17	0	4	0	5.4	12.4	7.54	6.7	1.84
Conductivity(umhos/cm)	17	0	NA	0	212	634	461.18	504	119.49
Fecal Coliform(col/100ml)	12	0	400	**2**	12	600	80.26*	62	180.46
Lab Turbidity(NTU)	12	0	50	0	3.4	29.4	10.38	8.8	6.84
TSS(mg/L)	12	**1**	NA	0	1.25	21	5.35	4.5	5.1
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	0	NA	0	0.08	3.62	0.59	0.18	1
TKN-N(mg/L)	12	0	NA	0	0.83	3.84	1.81	1.62	0.91
NO2-NO3(mg/L)	12	0	NA	0	0.13	2.69	1.25	1.01	0.93
T. Phos.(mg/L)	12	0	NA	0	0.11	1.19	0.36	0.26	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.)

01/01/2018-12/31/2018 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	5.5	31.9	19.62	23.4	7.99
pH(su)	17	0	6~9	0	6.6	8.3	7.35	7.2	0.42
Diss. Oxy.(mg/L)	17	0	4	0	6.8	11.5	8.74	8.6	1.53
Conductivity(umhos/cm)	17	0	NA	0	85	404	222.24	204	106.31
Fecal Coliform(col/100ml)	12	0	400	**4**	22	9200	236.87*	171.5	2599.54
Lab Turbidity(NTU)	12	0	50	**1**	3.3	396	50.59	17.55	109.46
TSS(mg/L)	12	**1**	NA	0	1.25	268	36.44	14	73.93
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	**2**	NA	0	0.01	0.16	0.06	0.04	0.05
TKN-N(mg/L)	12	0	NA	0	0.87	2.15	1.28	1.23	0.33
NO2-NO3(mg/L)	12	0	NA	0	0.25	4.33	1.21	0.86	1.12
T. Phos.(mg/L)	12	0	NA	0	0.06	0.44	0.15	0.1	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.)

01/01/2018-12/31/2018 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	5.1	31.7	19.44	23.2	8.05
pH(su)	17	0	6~9	0	6.6	8.1	7.28	7.2	0.35
Diss. Oxy.(mg/L)	17	0	4	0	6.9	11.9	8.62	8.4	1.6
Conductivity(umhos/cm)	17	0	NA	0	84	416	222.82	203	113.04
Fecal Coliform(col/100ml)	12	0	400	**5**	25	9200	325.62*	380	2603.37
Lab Turbidity(NTU)	12	0	50	**3**	4.3	320	48.5	18.6	88.06
TSS(mg/L)	12	0	NA	0	3	276	38.42	13.5	75.99
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	**5**	NA	0	0.01	0.19	0.05	0.04	0.06
TKN-N(mg/L)	12	0	NA	0	0.8	2.38	1.27	1.15	0.45
NO2-NO3(mg/L)	12	0	NA	0	0.27	4.42	1.24	0.7	1.19
T. Phos.(mg/L)	12	0	NA	0	0.06	0.44	0.15	0.11	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.)

01/01/2018-12/31/2018 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	3	29.7	18.56	21.7	7.58
pH(su)	17	0	6~9	0	6.6	7.2	6.93	6.9	0.19
Diss. Oxy.(mg/L)	17	0	4	0	5	12.1	7.76	7.2	2.04
Conductivity(umhos/cm)	17	0	NA	0	82	188	126.82	117	30.96
Fecal Coliform(col/100ml)	12	0	400	**4**	105	12000	352.01*	164.5	3376.9
Lab Turbidity(NTU)	12	0	50	0	5	27.3	17.82	19.9	7.78
TSS(mg/L)	12	0	NA	0	4	25	13.25	12.5	6.62
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	**3**	NA	0	0.01	0.14	0.06	0.04	0.05
TKN-N(mg/L)	12	0	NA	0	0.42	2.45	1.01	0.8	0.53
NO2-NO3(mg/L)	12	0	NA	0	0.1	0.44	0.24	0.21	0.11
T. Phos.(mg/L)	12	0	NA	0	0.02	0.07	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.)

01/01/2018-12/31/2018 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	6.7	28.2	17.54	18.05	8.6
pH(su)	12	0	6~9	0	6.9	8.1	7.23	7.15	0.33
Diss. Oxy.(mg/L)	12	0	4	0	5.7	11.6	8.32	7.6	2.17
Conductivity(umhos/cm)	12	0	NA	0	81	339	201.5	207	84.27
Fecal Coliform(col/100ml)	12	0	400	**3**	27	12000	149.60*	81	3418.89
Lab Turbidity(NTU)	12	0	50	**1**	5.2	98.1	22.99	10.65	26.52
TSS(mg/L)	12	0	NA	0	4	120	19.33	6	32.84
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	**4**	NA	0	0.01	0.13	0.05	0.03	0.05
TKN-N(mg/L)	12	0	NA	0	0.61	1.95	0.99	0.92	0.35
NO2-NO3(mg/L)	12	0	NA	0	0.37	1.85	1.06	1.01	0.53
T. Phos.(mg/L)	12	0	NA	0	0.06	0.2	0.11	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.)

01/01/2018-12/31/2018 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)	16	0	32	0	6.1	29.8	20.57	24.2	8.9
pH(su)	16	0	6~9	0	7	8.3	7.62	7.55	0.42
Diss. Oxy.(mg/L)	16	0	4	0	7.1	12.8	9.04	7.95	1.93
Conductivity(umhos/cm)	16	0	NA	0	80	431	198.81	158.5	105.16
Fecal Coliform(col/100ml)	12	0	400	**2**	9	2600	62.54*	30	886.8
Lab Turbidity(NTU)	12	0	50	**1**	2.5	68.2	18.65	11	19.24
TSS(mg/L)	12	**2**	NA	0	1.25	48	12.71	6	14.16
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	**8**	NA	0	0.01	0.12	0.03	0.01	0.04
TKN-N(mg/L)	12	0	NA	0	0.71	2.5	1.11	1	0.49
NO2-NO3(mg/L)	12	0	10	0	0.34	3.18	1.19	1.02	0.83
T. Phos.(mg/L)	12	0	NA	0	0.07	0.14	0.1	0.1	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.)

01/01/2018-12/31/2018 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)	16	0	32	0	7.8	27.2	19.72	22.65	5.92
pH(su)	16	0	6~9	0	6.3	7	6.74	6.8	0.19
Diss. Oxy.(mg/L)	16	0	4	**1**	3.6	9.4	6.13	5.7	1.46
Conductivity(umhos/cm)	16	0	NA	0	58	184	121.44	133	36.45
Fecal Coliform(col/100ml)	11	0	400	**6**	30	12000	522.79*	600	4679.53
Lab Turbidity(NTU)	11	0	50	**4**	8.8	145	44.57	25	48.03
TSS(mg/L)	11	0	NA	0	3	118	37.09	21	38.38
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	11	**4**	NA	0	0.01	0.11	0.04	0.01	0.03
TKN-N(mg/L)	11	0	NA	0	0.31	3.34	1.07	0.89	0.81
NO2-NO3(mg/L)	11	**1**	10	0	0.01	3.2	0.38	0.1	0.94
T. Phos.(mg/L)	11	0	NA	0	0.04	0.11	0.06	0.06	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)	2	0	NA	0	36	40	38	38	2.83

(* 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.)

01/01/2018-12/31/2018 Summary Report

Station Id:	New Hope Crk at SR 1107 Stagecoach Rd nr Blands								
B3040000/UCFRBA_20		**Stream Class**		WS-IV NSW			**Sub Basin**	CPF05	
County	Durham	**Latitude**	35.8847	**Longitude**	-78.9656		**HUC**	3030002	

Parameter	**Count**	**< DT**	**WQS**	**#Exceed**	**MIN**	**MAX**	**AVG**	**Median**	**Std Dev*** **
Temperature(C)	16	0	32	0	4.5	28	18.99	22.2	6.95
pH(su)	16	0	6~9	0	6.4	7.1	6.87	6.95	0.26
Diss. Oxy.(mg/L)	16	0	4	**1**	2.1	11	7	6.65	2.03
Conductivity(umhos/cm)	16	0	NA	0	57	467	225.25	218.5	124.26
Fecal Coliform(col/100ml)	11	0	400	**5**	23	12000	422.58*	152	4768.11
Lab Turbidity(NTU)	11	0	50	**4**	5.6	266	70.51	19.2	92.23
TSS(mg/L)	11	0	NA	0	5	122	45.45	21	45.68
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	11	**2**	NA	0	0.01	0.3	0.09	0.06	0.1
TKN-N(mg/L)	11	0	NA	0	0.62	1.88	1.22	1.19	0.37
NO2-NO3(mg/L)	11	**1**	10	0	0.01	5.83	1.47	0.7	1.81
T. Phos.(mg/L)	11	0	NA	0	0.08	0.27	0.17	0.17	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)	2	0	NA	0	40	48	44	44	5.66

(* 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.)

01/01/2018-12/31/2018 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	2.2	28.1	19.48	22.6	7.23
pH(su)	17	0	6~9	0	6.4	7.5	7.05	7.2	0.36
Diss. Oxy.(mg/L)	17	0	4	1	3	12.3	7.19	6.8	2.01
Conductivity(umhos/cm)	17	0	NA	0	55	616	304.29	292	186.28
Fecal Coliform(col/100ml)	12	0	400	6	57	9400	384.53*	365	2684.13
Lab Turbidity(NTU)	12	0	50	4	12.5	203	62.98	31.85	62.1
TSS(mg/L)	12	0	NA	0	9	147	42.92	32	38.26
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	7	NA	0	0.01	0.15	0.03	0.01	0.04
TKN-N(mg/L)	12	0	NA	0	0.75	2.77	1.33	1.12	0.61
NO2-NO3(mg/L)	12	0	10	0	0.08	7.79	1.67	0.91	2.23
T. Phos.(mg/L)	12	0	NA	0	0.06	0.63	0.16	0.1	0.16
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)	2	0	NA	0	36	60	48	48	16.97

(* 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.)

01/01/2018-12/31/2018 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)	11	0	32	0	7.9	26	18.35	21.6	6.21
pH(su)	11	0	6~9	0	6.4	7.2	6.88	6.9	0.25
Diss. Oxy.(mg/L)	11	0	4	0	5.6	9.4	7.17	6.9	1.41
Conductivity(umhos/cm)	11	0	NA	0	72	286	185.36	169	76.38
Fecal Coliform(col/100ml)	11	0	400	**6**	39	12000	696.94*	800	4662.58
Lab Turbidity(NTU)	11	0	50	**4**	8	230	61.45	32.5	71.74
TSS(mg/L)	11	0	NA	0	4	97	39.09	23	39.53
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	11	**4**	NA	0	0.01	0.17	0.05	0.04	0.05
TKN-N(mg/L)	11	0	NA	0	0.31	2.09	1.04	1.02	0.48
NO2-NO3(mg/L)	11	0	10	0	0.05	0.43	0.24	0.25	0.13
T. Phos.(mg/L)	11	0	NA	0	0.08	0.27	0.12	0.12	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)	2	0	NA	0	24	76	50	50	36.77

(* 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.)

01/01/2018-12/31/2018 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)	17	0	32	0	0.2	28.2	18.92	22.8	7.65
pH(su)	17	0	6~9	0	6.5	7.3	7	7	0.19
Diss. Oxy.(mg/L)	17	0	4	0	6	13.4	8.17	7.4	1.9
Conductivity(umhos/cm)	17	0	NA	0	68	348	143.35	136	65.4
Fecal Coliform(col/100ml)	12	0	400	**5**	6	12000	324.95*	275	3691.16
Lab Turbidity(NTU)	12	0	50	**3**	2.9	147	38.02	6.9	55.17
TSS(mg/L)	12	**2**	NA	0	1.25	161	33.88	8	48.74
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	**8**	NA	0	0.01	0.09	0.03	0.01	0.03
TKN-N(mg/L)	12	**1**	NA	0	0.1	1.97	0.87	0.83	0.53
NO2-NO3(mg/L)	12	0	10	0	0.08	0.79	0.36	0.31	0.22
T. Phos.(mg/L)	12	**1**	NA	0	0.01	0.13	0.05	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.)

01/01/2018-12/31/2018 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	2.2	27.3	19.09	22.4	6.93
pH(su)	17	0	6~9	0	6.3	7.3	6.97	7.1	0.34
Diss. Oxy.(mg/L)	17	0	4	**1**	3.9	12.4	7.29	6.7	1.95
Conductivity(umhos/cm)	17	0	NA	0	61	609	269.94	271	161.38
Fecal Coliform(col/100ml)	12	0	400	**4**	24	6800	296.08*	230	1942.45
Lab Turbidity(NTU)	12	0	50	**3**	3	86.1	27.64	8.5	29.75
TSS(mg/L)	12	**1**	NA	0	1.25	57	18.19	9.5	17.25
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	**3**	NA	0	0.01	0.69	0.12	0.06	0.19
TKN-N(mg/L)	12	0	NA	0	0.37	2.19	1.23	1.17	0.55
NO2-NO3(mg/L)	12	0	10	0	0.26	7.15	2.58	1.51	2.53
T. Phos.(mg/L)	12	0	NA	0	0.05	0.3	0.14	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.)

01/01/2018-12/31/2018 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)	16	0	32	0	7.2	28.3	20.08	23.4	8.08
pH(su)	16	0	6~9	0	6.5	7.9	7.02	7.05	0.32
Diss. Oxy.(mg/L)	16	0	4	0	5.4	12.6	8.06	7.5	2.45
Conductivity(umhos/cm)	16	0	NA	0	70	328	159.88	153.5	62.61
Fecal Coliform(col/100ml)	12	0	400	**2**	2	1400	21.45*	13	412.42
Lab Turbidity(NTU)	12	0	50	0	4.4	32.3	15.18	12.1	10.86
TSS(mg/L)	12	0	NA	0	4	23	9.92	7.5	6.76
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	**3**	NA	0	0.01	0.35	0.1	0.08	0.1
TKN-N(mg/L)	12	0	NA	0	0.61	1.84	1.06	0.97	0.37
NO2-NO3(mg/L)	12	0	10	0	0.05	1.66	0.52	0.41	0.43
T. Phos.(mg/L)	12	0	NA	0	0.04	0.1	0.06	0.06	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.)

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

01/01/2018-12/31/2018 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	7.5	29.5	18.61	19.65	8.61
pH(su)	12	0	6~9	0	6.7	7.4	7.08	7.05	0.23
Diss. Oxy.(mg/L)	12	0	4	0	6.5	12.1	8.83	7.95	2.02
Conductivity(umhos/cm)	12	0	NA	0	80	227	138.42	130.5	47.54
Fecal Coliform(col/100ml)	12	0	400	**2**	12	6600	126.25*	105	2027.2
Lab Turbidity(NTU)	12	0	50	**1**	3.1	69.8	19.34	9.2	19.62
TSS(mg/L)	12	**1**	NA	0	1.25	66	15.02	7.5	19.21
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	**7**	NA	0	0.01	0.13	0.04	0.01	0.04
TKN-N(mg/L)	12	0	NA	0	0.49	2.02	1.05	1	0.41
NO2-NO3(mg/L)	12	0	10	0	0.25	1.49	0.76	0.66	0.36
T. Phos.(mg/L)	12	0	NA	0	0.09	0.3	0.17	0.16	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.)

01/01/2018-12/31/2018 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)	16	0	32	0	5.9	27.7	19.51	23	6.88
pH(su)	16	0	6~9	0	6.7	7.9	7.18	7.25	0.29
Diss. Oxy.(mg/L)	16	0	4	0	6.7	11.8	8.61	7.75	1.75
Conductivity(umhos/cm)	16	0	NA	0	133	236	188.88	191.5	34.06
Fecal Coliform(col/100ml)	11	0	400	**3**	25	1800	223.14*	270	532.18
Lab Turbidity(NTU)	11	0	50	0	1.9	28.4	11.35	5.8	10.04
TSS(mg/L)	11	**2**	NA	0	1.25	13	5.77	4	3.97
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	11	**1**	NA	0	0.01	0.17	0.07	0.06	0.05
TKN-N(mg/L)	11	0	NA	0	0.25	1.39	0.87	0.92	0.31
NO2-NO3(mg/L)	11	0	10	0	0.11	1.05	0.55	0.47	0.27
T. Phos.(mg/L)	11	**4**	NA	0	0.01	0.04	0.02	0.03	0.01
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.)
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(*** Standard Deviation range of values is also affected by climate and storm events and etc.)

01/01/2018-12/31/2018 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	3.8	30.8	19.86	24.4	9
pH(su)	17	0	6~9	0	6.7	8.5	7.16	7.1	0.39
Diss. Oxy.(mg/L)	17	0	4	0	5.9	11.6	8.24	8.2	2.05
Conductivity(umhos/cm)	17	0	NA	0	65	226	142.94	140	42.97
Fecal Coliform(col/100ml)	12	0	400	**2**	2	800	49.14*	40	259.83
Lab Turbidity(NTU)	12	0	50	0	4.7	40	11.82	7.55	9.83
TSS(mg/L)	12	**2**	NA	0	1.25	25	8.62	7	6.66
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	**9**	NA	0	0.01	0.1	0.02	0.01	0.03
TKN-N(mg/L)	12	0	NA	0	0.61	2.19	1.03	0.91	0.44
NO2-NO3(mg/L)	12	**1**	10	0	0.01	0.4	0.16	0.12	0.14
T. Phos.(mg/L)	12	**1**	NA	0	0.01	0.07	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.)
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01/01/2018-12/31/2018 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	0.1	23.8	15.44	18.75	8.39
pH(su)	12	0	6~9	0	6.8	7.4	7.08	7.1	0.19
Diss. Oxy.(mg/L)	12	0	4	0	6	12.5	8.83	8.1	2.32
Conductivity(umhos/cm)	12	0	NA	0	86	284	169	171	51.52
Fecal Coliform(col/100ml)	12	0	400	**3**	20	1000	186.24*	185.5	317.72
Lab Turbidity(NTU)	12	0	50	0	2.3	29.5	10.74	3.7	10.69
TSS(mg/L)	12	**6**	NA	0	1.25	16	5.47	2.17	5.65
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	**7**	NA	0	0.01	0.05	0.02	0.01	0.02
TKN-N(mg/L)	12	**1**	NA	0	0.1	2.43	0.92	0.92	0.59
NO2-NO3(mg/L)	12	0	10	0	0.1	0.7	0.43	0.43	0.17
T. Phos.(mg/L)	12	0	NA	0	0.03	0.12	0.06	0.06	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.)

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01/01/2018-12/31/2018 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	1	28.1	16.12	14.15	8.39
pH(su)	12	0	6~9	0	6.5	7.6	7.07	7.1	0.34
Diss. Oxy.(mg/L)	12	0	4	0	4.8	13.1	9.12	9.1	2.46
Conductivity(umhos/cm)	12	0	NA	0	75	219	127.17	117.5	38.25
Fecal Coliform(col/100ml)	12	0	400	**7**	9	12000	388.43*	430	4530.65
Lab Turbidity(NTU)	12	0	50	**1**	3.9	90	19.75	13.8	23.72
TSS(mg/L)	12	**1**	NA	0	1.25	63	13	7.35	16.53
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	**8**	NA	0	0.01	3.51	0.39	0.01	1.02
TKN-N(mg/L)	12	0	NA	0	0.39	4.74	1.34	0.91	1.17
NO2-NO3(mg/L)	12	**2**	NA	0	0.01	1.63	0.36	0.25	0.44
T. Phos.(mg/L)	12	**4**	NA	0	0.01	0.42	0.08	0.03	0.12
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.)
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01/01/2018-12/31/2018 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	2.6	27.7	19.18	23.7	7.8
pH(su)	17	0	6~9	0	6.8	7.8	7.31	7.3	0.27
Diss. Oxy.(mg/L)	17	0	4	0	6.4	11.6	8.43	8.1	1.57
Conductivity(umhos/cm)	17	0	NA	0	104	221	191.41	208	34.65
Fecal Coliform(col/100ml)	12	0	400	**1**	6	590	34.73*	30.5	162.9
Lab Turbidity(NTU)	12	0	50	0	1.5	11	5.23	5.35	2.92
TSS(mg/L)	12	**1**	NA	0	1.3	7	4.36	4	1.92
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	**4**	NA	0	0.01	0.34	0.1	0.07	0.11
TKN-N(mg/L)	12	0	NA	0	0.35	1.9	1.06	1.17	0.41
NO2-NO3(mg/L)	12	0	NA	0	0.06	0.4	0.2	0.16	0.12
T. Phos.(mg/L)	12	**7**	NA	0	0.01	0.05	0.02	0.01	0.01
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)	2	0	NA	0	44	48	46	46	2.83

(* Fecal Coliform Geomean)

(** The Aluminum standard comes from the EPA's 2006 recommended water quality criteria.)

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01/01/2018-12/31/2018 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**	-79.77623		**HUC**	3030003	

Parameter	**Count**	**< DT**	**WQS**	**#Exceed**	**MIN**	**MAX**	**AVG**	**Median**	**Std Dev*** **
Temperature(C)	17	0	32	0	4.7	28.5	19.43	23.8	7.76
pH(su)	17	0	6~9	0	6.9	7.6	7.36	7.4	0.21
Diss. Oxy.(mg/L)	17	0	4	0	7	16.6	9.08	7.9	2.48
Conductivity(umhos/cm)	17	0	NA	0	93	218	175.41	192	41.54
Fecal Coliform(col/100ml)	12	0	400	**2**	5	12400	76.10*	76	3547.23
Lab Turbidity(NTU)	12	0	50	**1**	2.8	73.2	13.22	8.65	19.14
TSS(mg/L)	12	**1**	NA	0	1.25	73	11.83	6.5	19.53
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	**2**	NA	0	0.01	0.42	0.13	0.1	0.12
TKN-N(mg/L)	12	0	NA	0	0.63	2.12	1.25	1.17	0.42
NO2-NO3(mg/L)	12	0	NA	0	0.14	0.43	0.28	0.3	0.1
T. Phos.(mg/L)	12	0	NA	0	0.04	0.12	0.07	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.)

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

01/01/2018-12/31/2018 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**	-79.77213		**HUC**	3030003	

Parameter	**Count**	**< DT**	**WQS**	**#Exceed**	**MIN**	**MAX**	**AVG**	**Median**	**Std Dev*** **
Temperature(C)	17	0	32	0	2.8	28.4	19.81	23.8	8.09
pH(su)	17	0	6~9	0	6.9	8.8	7.43	7.3	0.53
Diss. Oxy.(mg/L)	17	0	4	0	6.4	13.8	8.89	8.8	2.05
Conductivity(umhos/cm)	17	0	NA	0	110	244	192.71	202	36.22
Fecal Coliform(col/100ml)	12	0	400	**1**	4	6200	90.41*	114.5	1757.5
Lab Turbidity(NTU)	12	0	50	**1**	3.7	53.6	13.36	10.9	13.02
TSS(mg/L)	12	**1**	NA	0	1.25	44	11.69	9	10.79
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	**4**	NA	0	0.01	0.31	0.09	0.04	0.11
TKN-N(mg/L)	12	0	NA	0	0.87	2.88	1.22	0.97	0.58
NO2-NO3(mg/L)	12	0	NA	0	0.24	1.66	0.62	0.57	0.37
T. Phos.(mg/L)	12	0	NA	0	0.04	0.17	0.07	0.05	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.)

01/01/2018-12/31/2018 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	2.7	29.9	19.98	24.1	8.63
pH(su)	17	0	6~9	0	6.6	8	7.25	7.3	0.31
Diss. Oxy.(mg/L)	17	0	4	0	6.2	13.2	8.56	7.5	2.23
Conductivity(umhos/cm)	17	0	NA	0	98	247	185.35	180	42.64
Fecal Coliform(col/100ml)	12	0	400	**2**	14	4400	113.66*	171	1234.27
Lab Turbidity(NTU)	12	0	50	0	2.4	21.9	10.59	9.95	5.96
TSS(mg/L)	12	**2**	NA	0	1.25	11	6.71	7	3.53
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	**6**	NA	0	0.01	0.18	0.06	0.03	0.06
TKN-N(mg/L)	12	0	NA	0	0.61	3.69	1.22	1.06	0.8
NO2-NO3(mg/L)	12	0	NA	0	0.48	1.66	0.78	0.65	0.34
T. Phos.(mg/L)	12	0	NA	0	0.03	0.09	0.06	0.06	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.)

01/01/2018-12/31/2018 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	2.2	29.7	19.63	24	8.42
pH(su)	17	0	6~9	0	6.7	7.6	7.14	7.2	0.24
Diss. Oxy.(mg/L)	17	0	4	0	5.9	12.8	8.28	7	2.17
Conductivity(umhos/cm)	17	0	NA	0	98	242	177.71	175	40.98
Fecal Coliform(col/100ml)	12	0	400	**2**	16	3000	113.29*	105	838.55
Lab Turbidity(NTU)	12	0	50	0	2.6	37	13.17	12.3	9.7
TSS(mg/L)	12	**1**	NA	0	1.25	35	10.35	9	8.94
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	**4**	NA	0	0.01	0.19	0.06	0.03	0.06
TKN-N(mg/L)	12	0	NA	0	0.53	2.48	1.15	1.08	0.49
NO2-NO3(mg/L)	12	0	NA	0	0.45	1.4	0.71	0.61	0.27
T. Phos.(mg/L)	12	0	NA	0	0.04	0.11	0.07	0.07	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.)

01/01/2018-12/31/2018 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	0.1	25.1	16.81	20.1	7.31
pH(su)	17	0	6~9	0	6.6	7.3	6.95	7	0.2
Diss. Oxy.(mg/L)	17	0	4	0	5.6	11.3	7.77	6.3	2.19
Conductivity(umhos/cm)	17	0	NA	0	98	357	188.59	169	69.01
Fecal Coliform(col/100ml)	12	0	400	**8**	105	1600	600.93*	595	473.8
Lab Turbidity(NTU)	12	0	50	0	5	21.4	13.49	14	5.94
TSS(mg/L)	12	0	NA	0	3	12	7.17	8	2.82
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	**9**	NA	0	0.01	2.55	0.24	0.01	0.73
TKN-N(mg/L)	12	0	NA	0	0.83	6.12	1.71	1.2	1.46
NO2-NO3(mg/L)	12	0	10	0	0.96	5.51	2.51	2.31	1.24
T. Phos.(mg/L)	12	0	NA	0	0.1	2.86	0.61	0.47	0.74
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.)

01/01/2018-12/31/2018 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)	14	0	32	0	6.1	28.9	19.69	23.35	8.75
pH(su)	14	0	6~9	0	6.7	7.2	6.89	6.9	0.14
Diss. Oxy.(mg/L)	14	0	4	0	5.3	11.7	7.55	6.45	2.28
Conductivity(umhos/cm)	14	0	NA	0	82	204	126.71	113.5	35.72
Fecal Coliform(col/100ml)	10	0	400	**2**	36	3400	141.39*	81	1103.86
Lab Turbidity(NTU)	10	0	50	**1**	4.4	83.1	22.48	15.95	23.52
TSS(mg/L)	10	**1**	NA	0	1.25	100	20.43	9.5	29.52
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	10	**5**	NA	0	0.01	0.33	0.08	0.03	0.12
TKN-N(mg/L)	10	0	NA	0	0.51	1.36	0.82	0.85	0.26
NO2-NO3(mg/L)	10	**1**	NA	0	0.01	0.93	0.49	0.49	0.26
T. Phos.(mg/L)	10	0	NA	0	0.04	0.14	0.09	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.)

01/01/2018-12/31/2018 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)	15	0	32	0	5	28.8	19.99	24.6	8.57
pH(su)	15	0	6~9	0	6.5	7.1	6.88	6.9	0.16
Diss. Oxy.(mg/L)	15	0	4	0	4.4	12.3	7.32	6.2	2.37
Conductivity(umhos/cm)	15	0	NA	0	82	205	138.53	120	41.55
Fecal Coliform(col/100ml)	11	0	400	**3**	38	3800	174.12*	86	1198.62
Lab Turbidity(NTU)	11	0	50	**1**	7.8	52.3	19.6	13.3	14.59
TSS(mg/L)	11	0	NA	0	3	77	17.91	9	21.97
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	11	**4**	NA	0	0.01	0.78	0.12	0.03	0.23
TKN-N(mg/L)	11	0	NA	0	0.65	2.31	1.08	0.93	0.45
NO2-NO3(mg/L)	11	0	NA	0	0.3	1.4	0.84	0.68	0.4
T. Phos.(mg/L)	11	0	NA	0	0.09	0.51	0.2	0.18	0.12
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.)

01/01/2018-12/31/2018 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)	16	0	32	0	6.2	29	20.17	24.55	8.41
pH(su)	16	0	6~9	0	6.5	7.2	6.88	6.9	0.21
Diss. Oxy.(mg/L)	16	0	4	**1**	3.3	11.8	7.42	6.9	2.84
Conductivity(umhos/cm)	16	0	NA	0	53	124	86	84.5	16.54
Fecal Coliform(col/100ml)	12	0	400	**3**	6	1400	85.47*	81	451.45
Lab Turbidity(NTU)	12	0	50	0	2.7	35.5	14.93	15.1	10.74
TSS(mg/L)	12	**2**	NA	0	1.25	29	9.88	6.5	9.77
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	**5**	NA	0	0.01	0.11	0.05	0.03	0.05
TKN-N(mg/L)	12	0	NA	0	0.85	3.15	1.39	1.12	0.7
NO2-NO3(mg/L)	12	0	NA	0	0.12	0.84	0.4	0.34	0.24
T. Phos.(mg/L)	12	0	NA	0	0.06	0.23	0.11	0.1	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.)

01/01/2018-12/31/2018 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)	16	0	32	0	7.4	27	19.61	23.4	7.13
pH(su)	16	0	6~9	0	6.5	7.2	6.92	6.95	0.18
Diss. Oxy.(mg/L)	16	0	4	0	5	11.9	7.3	6.35	2.32
Conductivity(umhos/cm)	16	0	NA	0	80	313	172.5	162.5	82.18
Fecal Coliform(col/100ml)	12	0	400	**3**	30	4200	142.05*	95.5	1184.87
Lab Turbidity(NTU)	12	0	50	**1**	4.1	305	36.33	11.5	84.89
TSS(mg/L)	12	**1**	NA	0	1.25	245	27.02	6	68.85
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	**5**	NA	0	0.01	0.11	0.05	0.04	0.04
TKN-N(mg/L)	12	0	NA	0	0.93	2.51	1.41	1.21	0.52
NO2-NO3(mg/L)	12	0	NA	0	0.64	3.56	1.94	1.71	1.16
T. Phos.(mg/L)	12	0	NA	0	0.04	0.18	0.1	0.09	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.)

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

01/01/2018-12/31/2018 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)	16	0	32	0	5.4	24.5	18.39	21.65	6.43
pH(su)	16	0	6~9	0	6.8	7.3	7.12	7.2	0.19
Diss. Oxy.(mg/L)	16	0	4	0	6	11.3	7.99	7.45	1.68
Conductivity(umhos/cm)	16	0	NA	0	103	288	176.06	173	51.21
Fecal Coliform(col/100ml)	12	0	400	**4**	31	7600	278.96*	185.5	2723.07
Lab Turbidity(NTU)	12	0	50	**1**	2.7	166	23.09	7.3	45.98
TSS(mg/L)	12	**4**	NA	0	1.25	83	10.87	2.33	23.02
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	**7**	NA	0	0.01	0.21	0.05	0.01	0.07
TKN-N(mg/L)	12	0	NA	0	0.34	2.45	0.96	0.91	0.58
NO2-NO3(mg/L)	12	0	NA	0	0.16	1.24	0.57	0.51	0.33
T. Phos.(mg/L)	12	**1**	NA	0	0.01	0.16	0.05	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.)

01/01/2018-12/31/2018 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	7.6	27.5	19.99	22.85	6.78
pH(su)	16	0	6~9	0	7	7.9	7.51	7.55	0.24
Diss. Oxy.(mg/L)	16	0	4	0	7	11.7	8.68	7.85	1.63
Conductivity(umhos/cm)	16	0	NA	0	154	779	454.75	442	203.86
Fecal Coliform(col/100ml)	12	0	400	**3**	22	4000	140.42*	161.5	1163.51
Lab Turbidity(NTU)	12	**1**	50	**1**	0.5	110	15.14	2.8	30.79
TSS(mg/L)	12	**7**	NA	0	1.25	66	8	2.12	18.39
Chlorophyll-a(ug/L)	0								
NH3-N(mg/L)	12	**8**	NA	0	0.01	0.25	0.04	0.01	0.07
TKN-N(mg/L)	12	**4**	NA	0	0.1	1.94	0.65	0.53	0.58
NO2-NO3(mg/L)	12	0	NA	0	1.52	25.4	10.16	9.59	7.98
T. Phos.(mg/L)	12	**2**	NA	0	0.01	0.08	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.)

APPENDIX B: UCFRBA Board of Directors

UPPER CAPE FEAR RIVER BASIN ASSOCIATION

DIRECTORS AND ALTERNATE DIRECTORS
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APPENDIX C: UCFRBA Technical Advisory Committee

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Bryan Thompson	Siler City	Town Manager	bthompson@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
Cindy Perry	Pittsboro	Mayor	cperry@pittsboronc.gov
Cris Routh	Graham	ORC & Wastewater Treatment Plant Supervisor	crouth@cityofgraham.com
Danny Shaw	Ramseur	Mayor	shawdr1@hotmail.com
Davi 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
Ed Kerwin	Orange Water and Sewer Authority	Executive Director	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
Fred Royal	Pittsboro	Town Engineer	froyal@pittsboronc.gov
Glenn McGirt	Burlington	Laboratory Supervisor	gmcgirt@ci.burlington.nc.us
Godfrey Uzochukwu	NC A&T	Director Management Institute	uzo@ncat.edu
Janet MacFall	Elon University	Professor of Environmental Studies and Biology	macfallj@elon.edu
Jeff Adkins	Cary	Water Resources Manager	jeff.adkins@townofcary.org
Jen Schmitz	Triangle J Council of Governments	Principal Planner	jschmitz@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
Kris Pawlak	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	Water Quality Specialist	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

Preston Mitchell	Reidsville	City Manager	pmitchell@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
Sandra Bradshaw	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
Stephanie Smith	Morrisville		ssmith@townofmorrisville.org
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
Stormwater	Durham	Engineer, Stormwater Quality	stormwaterquality@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
Tom Hoban	Cape Fear River Assembly	Executive Director	drtomhoban@gmail.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: NC DWR 2012 Metals Monitoring Suspension Letter

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 F: UCFRBA Dissolved Metals Special Study Letter to NC DWR

UPPER CAPE FEAR RIVER BASIN ASSOCIATION, INC.
1398 Carrollton Crossing Drive
KERNERSVILLE, NC 27284

October 6, 2015

Mr. Steven Kroeger
NC Division of Water Resources
4401 Reedy Creek Road
Raleigh, NC 27607

Mr. Kroeger,

Since 2007, the State of North Carolina Department of Environment and Natural Resources (now the Department of Environmental Quality (DEQ)) has been engaged in a conversation with the US Environmental Protection Agency (US EPA) about how to best measure and regulate the presence of metals from artificial sources in the State's freshwaters. In 2015, these conversations have appeared to be approaching some resolution, indicating that all holders of National Pollution Discharge Elimination System (NPDES) permits will need to be aware of the concentration(s) of dissolved metals in their receiving streams, as well as accounting for their respective contributions to the concentration(s). This includes all monitoring coalitions in the State, which are permitted, via Memoranda of Agreement with the NC DEQ, to perform the monitoring and reporting requirements of multiple NPDES permittees as one group with a single administrative body.

In order to best account for its contributions to receiving waters, as well as to perform its monitoring and analysis responsibilities as effectively as possible, the Upper Cape Fear River Basin (UCFRBA) conducted a four-month pilot study on seven (7) metals at six (6) locations in the Upper Cape Fear River Basin. The metals were filtered using three different methodologies: one in-field filtration and two laboratory filtrations with different holding times. The details of the monitoring study are provided in Attachment A, which is a copy of the monitoring services contract between the UCFRBA and Meritech, Inc.

The four-month study yielded interesting results, some of which were unexpected by the UCFRBA Technical Advisory Committee and the Meritech, Inc., laboratory staff. Meritech, Inc., included barium and manganese in the project as positive controls that were expected to show recordable levels at all monitoring locations. The three sampling methodologies used in the pilot study, which includes the recommended method by NC DEQ and USEPA, yielded few detectable metals results. There were not high background levels of any of the metals sampled except for zinc, which is present in the filters and must be pre-washed to get representative results. All data is provided for NC DEQ to assess internally.

Lastly, the methodologies used had surprising results for the UCFRBA. Meritech, Inc., now recommends using in-field filtration, as it is simpler than originally thought and laboratory filtration was more labor- and time-intensive than originally thought. However, Meritech, Inc., found that much more deionized water was needed than originally estimated – about one gallon per site. This is necessary to prewash filters and is especially valuable in cleaning zinc from the filters. The study used a Clean Hands Dirty Hands sampling methodology, as detailed by the USEPA, but NC DEQ has stated publicly that a one-person sampling protocol should be sufficient for dissolved metals sampling in the future, which would conserve costs. Meritech, Inc., Laboratory Manager Kris Pawlak estimates that, with the savings in time and labor, there is no significant difference in the costs of filtration of dissolved metals in the field versus either laboratory filtration method.

The UCFRBA is satisfied that the data collected will permit us to progress with dissolved metals monitoring in a cost-effective manner that will protect North Carolina's waters and mitigate and resolve issues identified in current and past Total Maximum Daily Load assessments for our residents waters. We are pleased to share this data with

NC DEQ, in the hopes that it may be able to apply this data toward similar ends. We all share the goal of protecting the State's waters for current and future populations, and look forward to working closely with NC DEQ and our colleagues throughout North Carolina toward this goal.

Please do not hesitate to contact the UCFRBA with any questions or concerns regarding this study. We are also happy to discuss any matters relating to our NPDES permits and our MOA with NC DEQ.

Thank you for your interest and time in this matter.

Sincerely,

Charles Cocker, Chairman

CC: Sydney Miller, Technical Advisory Committee Chair
Scott Pickard, Quality Assurance/Quality Control Chair
Kris Pawlak, Meritech, Inc., Laboratory Manager
Cy Stober, UCFRBA administrative staff

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, 2017 between the UPPER CAPE FEAR RIVER BASIN ASSOCIATION, INC., hereinafter called the ASSOCIATION, and MERITECH, INC., hereinafter called the CONTRACTOR.

WITNESSETH:

WHEREAS, on June 26, 2017 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, 2015 to April 30, 2020; 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 2015, 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, Appendix A spreadsheet A-1 on page 8 shall be visited on the frequency specified in Appendix spreadsheet A-1 on page 8 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 Appendix A-1 of the MOA for each sampling site, in accordance with the requirements specified in Appendix B and C 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 B and C and Supplemental Exhibit 2 for each parameter found in Appendix A. The analysis must be performed using the protocols included in NCDENR' 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, 2017 through August 31, 2020.

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	472 hrs	
Management	200 hrs	
Reporting	300 hrs	
Field & admin Costs	972 hrs @ $36.00/ hr ave.	$34,992.00
		$42,054.00
Analysis		$45,228.00
Equipment		$3,000.00
Total 2017-2018		**$90,282.00**

- *Field sampling events will 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	468	$9.00	$4,212.00
Ammonia, Nitrogen	0.1	EPA 350.1	468	$12.00	$5,616.00
TKN	0.20	EPA 351.1	468	$21.00	$9,828.00
Nitrate/Nitrite, Nitrogen	0.10	EPA 353.2	468	$15.00	$7,020.00
Phosphorus, total	0.020	EPA 200.7	468	$12.00	$5,616.00
Fecal Coliform	1 col/100 ml	SM 9222D	468	$17.00	$7,956.00
Turbidity	1.0 NTU	EPA 180.1	468	$10.00	$4,680.00
Hardness, total	0.662	SM 2340B	12	$25.00	$300.00
TOTAL	**-**	**-**			**$45,228.00**

Year	% Increase	Annual Cost
September 2017 - August 2018	-	$90,282.00
September 2018 - August 2019	2 %	$92,087.64
September 2019 - August 2020	2 %	$93,929.39

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: _____
Dennis Hodge, UCFRBA Chairman

Date: 6/28/2017

ATTEST

_____
Secretary

Meritech, Inc

By: _____

Date: 6/29/17

ATTEST

_____
David Merritt, Vice President Meritech, Inc.

+

MERITECH, INC.
ENVIRONMENTAL LABORATORIES

UPPER CAPE FEAR RIVER BASIN ASSOCIATION MONITORING SERVICES

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

Addendum to Contract January 1, 2019

BACKGROUND

A. The UPPER CAPE FEAR RIVER BASIN ASSOCIATION (the "ASSOCIATION") and MERITECH, INC (the "CONTRACTOR") entered into a contract (the "CONTRACT") on September 1, 2017, for three-years worth of monitoring services.

B. The ASSOCIATION and CONTRACTOR desire to amend the CONTRACT to accommodate a two-year special monitoring study lead by the NC Division of Water Resources (NCDWR).

C. This CONTRACT ADDENDUM (the "AGREEMENT") is the third amendment to the CONTRACT.

SCOPE OF WORK

In addition to the Base Monitoring Services specified in the requirements of the MOA between the ASSOCIATION and the NCDWR, dated May 1, 2015, the CONTRACTOR will perform and complete additional water sampling and analyses for stations B4800000 (UCFRBA Station #34) and B5950000 (UCFRBA Station #43) as specified in the NCDWR's "Monitoring Plan for Upper and Middle Cape Fear River Watersheds".

Water sample analysis reporting to the ASSOCIATION: The results of all of the water sample analyses from all of the specified sampling sites shall be reported to the ASSOCIATION'S members by means of emailing spreadsheets electronically on the form approved by the ASSOCIATION and NCDWR's COALITION COORDINATOR.

Frequency: Monitoring must be done at the frequency specified in NCDWR's "Monitoring Plan for Upper and Middle Cape Fear River Watersheds".

Upon mutual agreement of the ASSOCIATION and CONTRACTOR, this AGREEMENT may be amended to reflect any additions or removal of analyses as deemed appropriate by the ASSOCIATION or NCDWR.

TERM OF AGREEMENT

The term of this AGREEMENT is from January 1, 2019 through August 31, 2020.

ANALYTICAL COSTS FOR ADDITIONAL SAMPLING

UCFRB Parameters	Reporting Limit (mg/L)	Method	Quantity/ 2 years	Cost Per Test	Cost Per 2 Years
BOD, 5 day	2.0	SM 5210B	48	$25.00	$1,200.00
BOD20 or 30	2.0	SM 5210B	4	$75.00	$300.00
Total Suspended Solids	2.5	SM2540D	20	$9.00	$180.00
Ammonia, Nitrogen	0.1	EPA 350.1	20	$12.00	$240.00
TKN	0.2	EPA 351.2	20	$21.00	$420.00
Nitrate/Nitrite, Nitrogen	0.10	EPA 353.2	20	$15.00	$300.00
Phosphorus, total	0.05	EPA 200.7	20	$12.00	$240.00
Ortho-Phosphate	0.05	SM 4500P E	68	$45.00	$3,060.00
Chlorophyll A	0.001	EPA 445	68	$80.00	$5,440.00
TOC	1	SM 5310C	68	$45.00	$3,060.00
Turbidity	1.0 NTU	EPA 180.1	20	$10.00	$200.00
TOTAL/ 2 years	-	-			**$14,640.00**

COST BREAKDOWN

Monthly Costs

Year	Current Monthly Costs	Additional Monthly Costs	New Monthly Total
September 2018 – August 2019	$7,648.47	$610.00	$8,258.47
September 2019 – August 2020	$7,801.44	$610.00	$8,411.44

Annual Costs

Year	Current Annual Costs	Additional Annual Costs	NEW Annual Total
September 2017 – August 2018	$89,982.00	-	$89,982.00
September 2018 – August 2019	$91,781.64	$4,880.00	$96,661.64
September 2019 – August 2020	$93,617.27	$7,320.00	$100,937.27

Except as otherwise expressly provided in this AGREEMENT, all of the terms and conditions of the CONTRACT remain unchanged and in full effect.

Upper Cape Fear River Basin Association

By: Michael Rhoney
Michael Rhoney, UCFRBA Chairman

Date: 12/21/18

Meritech, Inc

By:
David Merritt, Vice President Meritech, Inc

Date: 12/4/18

APPENDIX H: NC DWR 2018 Field Visit

UPPER CAPE FEAR RIVER BASIN ASSOCIATION
2018 MERITECH AUDIT SUMMARY

June 19, 2017

OVERVIEW

1. Scope of Audit

The QA Coordinator for the Water Sciences Section helps to verify the quality of the data provided to the Coalitions by conducting periodic audits of the contracted laboratories that analyze samples and supply data to the program.

As part of that effort, on 6/19/2018, an audit was conducted with the contracted Meritech sampler Wesley Yance by the QA Coordinator David Huffman. This audit reviewed the field sampling procedures of six Upper Cape Fear River Basin Association monitoring sites.

Mr. Yance was very accommodating and well prepared for the audit. He was well organized, polite, friendly, knowledgeable, and efficient. The recommendations made in this report are only an attempt to help enhance the program.

2. Meter Calibration

A Hanna meter (Serial # H198194) was used to measure the physical parameters (Temp., dissolved oxygen (DO), pH, and conductivity) at each sampling site. Mr. Yance also carried a YSI meter as a backup. I watched Mr. Yance field calibrate the Hanna meter at the first station. I also saw him perform calibration checks at mid-day and at the end of the sampling day. The initial calibration sheet is attached to this report.

According to Mr. Yance, meter maintenance is recorded in a log book back at the laboratory and all meters are cleaned on a routine basis.

3. Field Sampling Procedures

All field measurements are taken in-situ and reading were allowed to stabilize before they were recorded.

Bridge samples were collected using a plastic sampler that was weighed down with two perforated 1L bottles filled with rocks. Two sterilized 1L bottles are placed into the sampler and were used as secondary containers to directly fill the appropriate sample bottles that contained the proper preservatives. The secondary containers were changed at each site. Only two sites had grab samples due to the water depth bring too low and/or limited accessibility for the bridge sampler.

Sample bottles were placed in plastic bags along with ice and then places in an iced cooler. The samples were then delivered to the Meritech laboratory with the appropriate paperwork.

Recommendations:

To field rinse the secondary containers and the non-preserved sampling bottles with site water at all sites (if it is safe to do so).

4. Safety

Mr. Yance took proper safety measures. Gloves and safety vests were worn at all the sites. His vehicles hazard/strobe lights were used at most of the sites where he had to parked on the side of the road.

Recommendations:
Always use your hazard/strobe when your vehicle is parked on the side of a road.

5. Summary and Follow-up actions

I would like to thank Mr. Yance and other Meritech staff again for their time and patience during the visit. The sampling procedures I saw would result in quality site samples.

AUDITORS

Name	Title	Date
David Huffman	QA Coordinator NC DWR	7/11/2018

Approved By _____ 7/11/2018
Date