



North Carolina Waterworks
Operators Association

December 2021
Volume 24, Number 3

GO WITH THE FLOW

Training Tomorrow's Water Professionals Today

The purpose of GO WITH THE FLOW is to keep you, the operator, informed of some of the training opportunities that are available for your certification needs (new and renewal). Events may be scheduled by: NCWOA, Public Water Supply Section, State Laboratory of Public Health, and other sources. This newsletter may also contain information on new regulations, news from the Certification Board, and important need-to-know resource contacts.

North Fork's Auxiliary Spillway and Embankment Improvement Project

By Leslie Carreiro,
City of Asheville

The North Fork Water Treatment Plant (NF) has had the privilege of serving the greater Asheville area since 1955. This is the year the dam and water plant were completed. Since that time the North Carolina legislature passed the Dam Safety Law and over the decades supplementary Administrative Codes have been put into place, therefore the NF Dam was required to pass and store the Probable Maximum Precipitation (PMP) storm event due to its classification as a "very large high hazard" dam. The PMP storm would produce 34 inches of rain in a 24-hour period. The original principal spillway was not able to meet the current regulation without the use of a Flood Operations Plan (FOP). The FOP was a temporary fix until a

more permanent solution could be found. Other aspects of the dams that also needed to be improved were:

- Leakage into the raw water conduit / tunnel
- Semantic activity and the possible effect to the earthen dams (main and saddle)
- Integrity of the intake tower
- Principal spillway tainter gate system
- Integrity of the principal spillway



GENERAL VIEW OF MAIN DAM FROM
TOP OF SPILLWAY SLOPE
DECEMBER 30, 1953

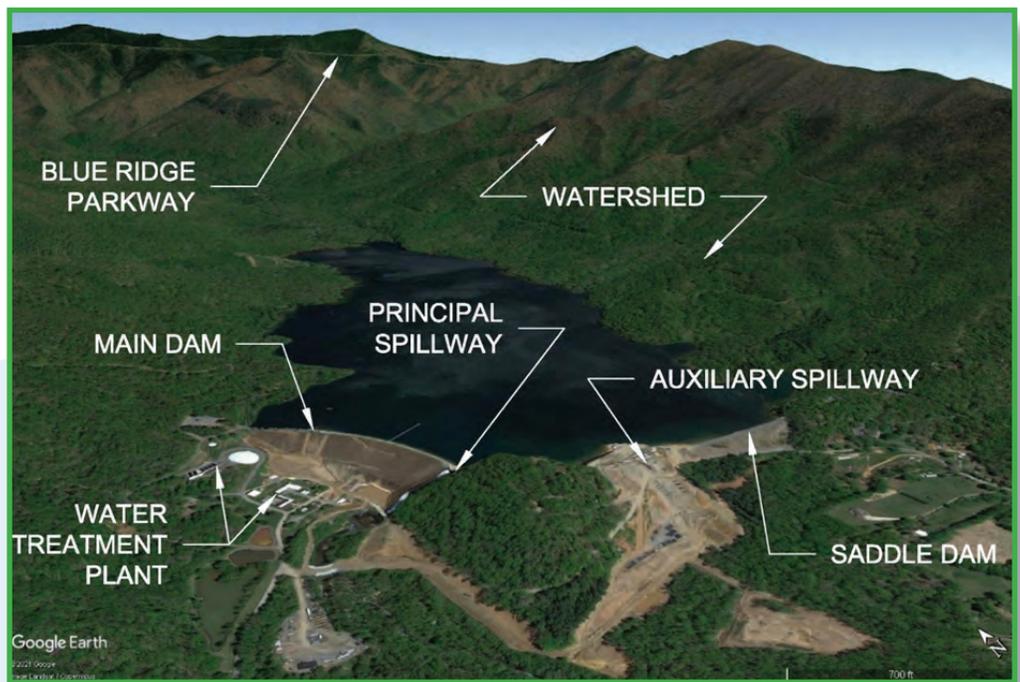
Check out
our website!
www.ncwoa.com

If you would like to nominate an operator for a spotlight article please contact Heather Cagle at heather@ncwoa.com.

Inside This Issue ...

North Fork's Auxiliary Spillway & Embankment Improvement Project	1-4
Join Our Team - Education Specialist Position	5
NCWOA Workshops & Training Events	6-7
NCWOA Sectional Training	8
Sponsors	9
Membership Application	10
Board & Committee Members	11
Important Phone Numbers	12

Beginning in 2012, the department began to look at different types of spillway designs and improvements to meet current regulations. Schnabel Engineering had been inspecting the dams for the department and had overseen small improvements. Due to this knowledge and their area of expertise, Schnabel was chosen to provide options and then engineering services (design, pre-qualifying construction companies, bidding, resident engineering services and construction oversight) for the project. In 2014 the Tennessee Valley Authority (TVA) began updating the rain data to provide more accurate PMP values to that region. Schnabel requested that the French Broad River Basin be included in the study, which proved to be a valuable asset to the design team. Once the data was available, the City of Asheville used the information to request an updated PMP amount from NC Dam Safety. The PMP volume went from 34 inches to 28.4 inches for a 24-hour period thus reducing the total volume of water the spillways would need to pass, limit the environmental impact, and reduce construction costs. A labyrinth design was chosen, with the final design being the first Fusegate spillway in North Carolina. This design reduced the spillway width by 100 feet; reducing excavation, construction time and costs.



event. Each fusegate is 16 feet high, 12.5 feet deep and 25 feet wide. The design allows for each Fusegate to fail (tip) at specific reservoir water surface level (elevation), thus progressively increasing the outflows during an extreme flood. Scarlett Kitts explains, "It was important to design the Fugates to fail within a narrow range of reservoir levels. Failing too early would result in frequent replacement of the Fusegates and unnecessary lowering of the reservoir. Failing too late or not failing at all could result in overtopping of the earthen embankments, and ultimately lead to a breach of the dam."

[Fusegate - details on how they "tip" \(https://www.environmental-expert.com/products/classic-fusegates-234825\)](https://www.environmental-expert.com/products/classic-fusegates-234825)

pose. Other positive outcomes included less fuel usage, less air pollution and reduced impact to the environment as all the necessary soil was onsite.

New filter drains, collection vaults and weir were installed to allow for the natural seepage of the earthen dams to be collected, volume measured, and clarity recorded. Instrumentation was installed at both earthen dams, sidewalls, and piers of the Auxiliary Spillway and along the soil nail wall installed near the Auxiliary Spillway. The data from these monitoring points is stored in a Sensemetrics software program and is monitored for irregularities by staff of the watershed and Schnabel Engineering.

[Sensemetrics \(https://sensemetrics.com/industries/water/dams-levees/\)](https://sensemetrics.com/industries/water/dams-levees/)

Aspects of the project:

Fusegate Auxiliary Spillway

The Fusegate design provided more linear space for water to spill into the chute. The Fusegates are activated (water begins to spill over the Fusegates) when the principal spillway can no longer handle the rise in lake elevation, at the 200-year storm

Buttressing and Collection of Seepage from the Earthen Dams

Effective use of materials was designed into the project. Both the main and saddle dams needed buttressing for semantic stability so the large amount of soil that needed to be removed for the construction of the Auxiliary Spillway was used for this pur-

Rehabilitation of the Principal Spillway

The three original tainter gates were replaced with two concrete weirs and Obermeyer gate in the center bay, which will make the clearing debris easier. To address concerns of the unknown soil types, no seepage drains and the potential for

cavitation towards the bottom of the steep chute of the principal spillway; an eight-inch thick reinforced concrete overlay was installed. It was quite a feat to secure rebar on a 40% grade and ensure that the concrete cured at a rate that would not allow for sloughing.

Addition of Parapet Wall

Limiting the size of the auxiliary spillway to achieve the smallest environmental impact meant not only looking at the design but incorporating other aspects of the dam system. A four-foot parapet wall was added to the main dam and the saddle dam was constructed to match the same elevation. The wall allows for attenuation of flood waters, allowing the lake to rise without overtopping the earthen dams.

Raw Water Intake Tower

New FRP platforms, intake stem guides, and a ladder were installed in the tower. The tower house was reinforced with a 3.5 foot high concrete ring at a thickness of 1.5 feet to brace the existing brick walls and prevent the Intake Tower from flooding during a very large storm event. Also added was a hinged lip seal mechanical flood door on the



Main dam - early Spring 2019

outside of the tower doors. The catwalk to the tower was improved with the removal of the rotting wooden decking and the addition of marine grade no-slip decking.

Raw Water Pipe Conduit Extension & Vault

The addition of soil for the buttressing of the main dam meant the vault access to the conduit/tunnel had to be moved. The new access building allows for easy entrance and work. Improvements included better

lighting with sky lights, FRP railings and staircase, easy access to intake sample lines, good drainage for any moisture that accumulates and a drier environment which were all achieved with this aspect of the project and made this area much safer for staff to work. It should be noted that during this aspect of the project the raw water line feeding the treatment plant was disconnected. The contractor improved on the original engineering design for raw water to be pumped from the lake and into the flocculator, which was one of the most challenging aspects of the project. Once the temporary raw water and chemical feed systems were installed, tested and modifications made, the treatment staff had to take an active role in monitoring and addressing pretreatment issues from this temporary system. Staff did an amazing job and learned more about the various ways to keep the plant functioning and their own capabilities.

The project broke ground in November 2017 with Phillips and Jordan as the contractors for this large endeavor. Schnabel



Raw Water Pipe Conduit - late Spring 2019

provided a Resident Engineer to oversee the daily activities and act as the Owners' Representative. Schnabel also provided an internal Project Manager to work with the contractor, Schnabel and the City of Asheville on work change directives, schedule, meetings and pay applications. Various other support staff were necessary from Schnabel and Water Production to make the project a success.

The project was substantially completed on December 12, 2020 with the final ribbon cutting held on a beautiful fall day, October 22, 2021.

The American Society of Dam Safety Officers awarded the project the National Rehabilitation Project for 2021!



Upstream Sides of Fusegates - Fall 2019



Principal Spillway Overlay - Fall 2019



Auxiliary Spillway Drone Picture - September 2021

JOIN OUR TEAM!

NCWOA is a non-profit organization that offers training to water operators across the state. We are currently seeking an Education Specialist to assist with current training needs and the development of new educational opportunities.

Education Specialist Position (central and western part of NC)

Qualifications:

The applicant must possess at least a high school diploma and experience in the teaching of water industry professionals (equivalent experience in the teaching profession with advanced education beyond the high school level will be considered). This individual must possess a good working knowledge of the waterworks industry and good interactive skills to relate and communicate with industry professionals, managers and operators. Meeting planning and organizational skills a plus. The ideal candidate must be self-motivated with the ability to work independently. The individual must possess computer skills (Microsoft Suite; Word, Excel, PowerPoint, Access) to prepare reports and communicate information relevant to NCWOA and the waterworks profession. Also, experience with learning management system Moodle a plus. This position will require extensive travel primarily in central & western North Carolina. The applicant must possess a valid N.C. driver's license, reliable transportation and the ability to travel on a regular basis to include overnight stays as well as a personal computer. Residency in the central to western part of the state preferred. Exemplary oral and written communication skills; strong organizational skills; knowledge of current technology education such as video conferencing and online education.

Proposed Work Schedule and Salary:

This independent contractor position is part-time based on a 15-20 hour workweek and based on an hourly rate of \$20.00 - \$25.00 per hour, depending on experience. All travel expenses (mileage, meals and lodging) are to be reimbursed monthly by NCWOA. Office equipment such as printer and office supplies will also be provided and/or reimbursed.

Job Description (overview)

- Serves as a customer representative and a point of contact for NCWOA in a professional responsive manner.
- Works closely with Education Specialist in the development of new training opportunities and implementation of training events as scheduled.
- Supports the activities of the Seminars Committee and NCWOA sections in the planning and implementation of training events.
- Supports the activities of the Annual Schools Committee in the planning and implementation of certification schools. Assists in the development of a trainer mentoring program to help increase the instructor pool.
- Works closely with the Moodle program to further develop new training modules and to help recruit subject speakers.
- Design and conduct professional development/training opportunities for both in person learning and online learning programs to end users.
- Ability to manage and facilitate educational programs.
- Maintain a high standard of professionalism in representing NCWOA including confidentiality and adherence to policies, procedures, and other established guidelines as appropriate. Work cooperatively with Committees and colleagues, contributing positively and constructively to the achievement of Committees and NCWOA objectives and provide a high level of service to members and sponsors by establishing and maintaining effective working relationships and partnerships.

How to Apply

Send resume to heather@ncwoa.com

Open Until Filled

NCWOA Upcoming Workshops & Training Events

(tentative schedule as NCWOA monitors COVID situation)

All NCWOA seminars listed on pages 6 are for 6.0 contact hours and are pre-approved by the NCWTFOCB for treatment and distribution operators. Some of the seminars will also qualify for 6.0 wastewater contact hours. Individuals that attend an entire seminar will receive a Certificate of Attendance for 6.0 contact hours. Please see each individual seminar agenda or description for details. Seminar agendas and locations are tentative and may be subject to change.

January C-Level Certification School

January 10-14, 2022

Hickory Metro Convention Center
Hickory, NC

for more information and registration please visit www.ncwoa.com

Spring Certification School

A,B,C Surface and Well

March 28-April 1

McKimmon Center
Raleigh, NC

Advanced Day & Exhibits - March 30

more information coming in 2022

Fall Certification School

A,B,C Surface and Well

September 26-30

McKimmon Center
Raleigh, NC

Advanced Day & Exhibits - September 28

more information coming in 2022

Continuing Education

We are currently working on our training calendar for 2022 and more information will be coming soon. Virtual and in-person training will be scheduled.

If you are interested in specialized training (let us come to you with specific requested topics) please contact us at **252-764-2094**.

NCWOA Upcoming Workshops & Training Events

For more information and online registration, please visit our website at www.ncwoa.com

NCWOA SEMINAR REGISTRATION FORM

Deadline for entry is receipt at least 4 business days before a seminar. Space is limited - First Paid, First Accepted

Please Print or Type

NAME (First, MI, Last): _____ Nickname (For Tag) _____

SOCIAL SECURITY # (last 4 digits): XXX-XX-_____ EMPLOYER: _____

MAILING ADDRESS _____

CITY: _____ COUNTY: _____ STATE: _____ ZIP: _____

WORK PHONE: _____ Ext: _____ FAX: _____

EMAIL ADDRESS: _____

NC WATER TREATMENT CERTIFICATE # (OPERATOR ID #): _____ NCWOA MEMBER # : _____

NC WATER TREATMENT CERTIFICATE TYPE: __AS __BS __CS __AW __BW __CW __DW __AD __BD __CD __DD __CC/BF __None

NC WASTEWATER CERTIFICATION # (OPERATOR ID #): _____

NCWOA MEMBER PRICE IS \$65.00 (Must put your INDIVIDUAL NCWOA membership number on the line above to qualify)

NON-MEMBER PRICE IS \$125.00 (2022 NCWOA membership included in this price.)

CLASS INFORMATION COMING SOON

Please make checks payable to "NCWOA" or "North Carolina Waterworks Operators Association." We do NOT accept Purchase Orders. Credit Card payments may be mailed, faxed, or scanned but NOT called in. A confirmation letter/receipt and map will be mailed to each attendee once full payment is received.

REFUNDS: We will issue a refund (minus a \$25 administrative fee), if the refund is requested, in writing, at least 7 business days prior to the event. Refunds will be made in the same manner as payment. Substitutions may be made. Please inform us, as soon as possible, of substitutions so that the appropriate certificates of attendance may be generated.

PLEASE SEND APPLICATION AND PAYMENT TO:

Heather Cagle, NCWOA
PO Box 5466
High Point, NC 27262
Phone: 252-764-2094 ext. 1
Fax: 252-764-2095
Email: heather@ncwoa.com

CREDIT CARD PAYMENT

Credit Card Type: __ Visa __ MC __ AmEx __ Discover

Name on Credit Card: _____

Credit Card Number: _____

Exp Date: Month _____ Year _____ Security Code from back of Card _____

Cardholder's Signature: _____

If cardholder is other than attendee, what email address should the CC receipt be sent to? _____

To ensure that you receive the emailed receipt, please add heather@ncwoa.com to your email address book.

NCWOA USE: Amount: _____ CK# _____ E S Processed: _____

.....
: Credit Card Payment :
: Cannot be Processed :
: Over the Phone :
.....

NCWOA 2022 Sectional Training

(tentative schedule and could be subject to change)

All sectional training is open to anyone regardless of your particular section.
Training agendas and dates are tentative and may be subject to change.
Virtual and in-person training will be planned.

Western Sectional Training

March 3
May 26
August 16
October 18

Questions/RSVP to Brendan Kelley at (828) 232-4574 or BKelley@ashevillenc.gov

North Piedmont Sectional Training

March 10
June 2
August 4
October 6

Questions/RSVP to Melanie Clark at (336) 627-1009 ext 101 or mclark@edennc.us

South Piedmont Sectional Training

April 7
June 30
August 25
October 20

Questions/RSVP to Tena Mullis at (704) 920-5163 or mullistm@concordnc.gov

Northeast Sectional Training

March 1
May 3
August 9
October 11

Questions/RSVP to Dail Booth at (252) 551-1559 or boothrd@guc.com

Southeast Sectional Training

February 22
April 28
July 14
October 13

Questions/RSVP to Robin Miller at robin.miller@faypwc.com

Virtual Training Requirements

Participants must have broadband internet access, computer audio with microphone (or the ability to dial in by phone) and a web camera. We must be able to see the participant at all times during the sessions.
Must be an active member to receive credit hours.

We Appreciate Our Corporate Sponsors!



Interested in sponsorship? Multiple Opportunities Available

Please contact:

Allen Daniels, Public Image Committee (252) 230-8424 Email: allen@waterguardinc.com

Heather Cagle, NCWOA Administrator (252) 764-2094 ext. 1 Email: heather@ncwoa.com

or check our website at www.ncwoa.com

What's happening at your plant?

Are you going through an upgrade, adding some new features, starting a new process? Want to share your experience with other operators?

NCWOA would love to include an article in the Go With The Flow or if you are interested in hosting a sectional training meeting please contact Heather Cagle at 252.764.2094 ext. 1 or heather@ncwoa.com.

MEMBERSHIP APPLICATION

MISSION STATEMENT: To provide knowledge, skills & educational opportunities for drinking water professionals; develop working relationships with other water treatment organizations; project a positive image and communicate the importance of safe drinking water.



Membership Application

ANNUAL DUES ARE \$50.00 FOR 2022

First Name: _____ Middle Initial: _____ Last Name: _____

Nickname: _____ Social Security # (last 4 digits): xxx-xx-_____ If Renewal, what is your NCWOA Member #: _____

YOUR Individual Operator Certification #: (Issued by NCWTFOCB) _____

Certificate(s) Held:

___ A-Surface ___ B-Surface ___ C-Surface ___ A-Well ___ B-Well ___ C-Well ___ D-Well

___ A-Dist ___ B-Dist ___ C-Dist ___ D-Dist ___ Cross-Connection

_____ Wastewater #'s

___ None Yet ___ You are not an Operator & do not plan to become Certified.

PLEASE SELECT YOUR PREFERRED ADDRESS (This is where confirmations & membership info will be sent.)

___ Home Address: _____

City: _____ State _____ Zip _____ County: _____

___ Employer Name: _____

MAILING Address: _____

City: _____ State _____ Zip _____ County: _____

Work Phone : _____ Ext: _____ Fax: _____

Home Phone: _____ Cell Phone: _____

Email Address: _____

How would you like to receive your issues of Go With The Flow? Postal Delivery _____ OR Email _____

How would you like to receive your Section Meeting notices? Postal Delivery _____ OR Email _____

NOTE: Memberships are based upon a calendar year. Membership cards will be mailed with receipt. These cards will contain your name, membership number, and membership expiration date.

NOTE: Please make checks payable to "NCWOA" or "North Carolina Waterworks Operators Association." We do NOT accept Purchase Orders. Credit Card payments may be mailed, faxed, or scanned but NOT called in

CREDIT CARD PAYMENT

Credit Card Type: ___ Visa ___ MC ___ AmEx ___ Discover

Name on Credit Card: _____

Credit Card Number: _____

Exp Date: Month _____ Year _____ Security Code from back of Card _____

Cardholder's Signature: _____

If cardholder is other than attendee, what email address should the CC receipt be sent to? _____

To ensure that you receive the emailed receipt, please add heather@ncwoa.com to your email address book.

PLEASE SEND APPLICATION AND PAYMENT TO:

Heather Cagle, NCWOA Administrator

PO Box 5466

High Point, NC 27262

Phone: 252-764-2094 ext. 1

Fax: 252-764-2095

Email: heather@ncwoa.com

.....
: Credit Card Payment :
: Cannot be Processed :
: Over the Phone :
.....

NCWOA USE: Amount: _____ CK# _____ E S Processed: _____

Committee Members

2021-2022 Executive Committee

President

Ken Loflin
Email: kloflin95@gmail.com

First Vice-President

Sam Molinas
Broad River Water Authority
Phone: (828) 286-0731
Email: smolinas@ncbrwa.com

Second-Vice President

Steve Pope
Piedmont Triad Regional Water Authority
Phone: (336) 382-2373
Email: spope@ptrwa.org

Secretary

Michelle Clements
The East Group
Phone: (252) 758-3746 x 131
Email: michelle.clements@eastgroup.com

Treasurer

Leslie Carreiro
City of Asheville – North Fork WTP
Phone: (828) 271-6105
Email: icarreiro@ashevillenc.gov

Past President

Jeff Isley
Email: lsley1062@aol.com

Chair – Board of Examiners

Pat Irwin
Dare County
Phone: (252) 475-5603
Email: pat.irwin@darenc.com

Chair - Public Image

Allen Daniels
Water Guard, Inc.
Phone: (252) 230-8424
Email: allen@waterguardinc.com

Chair – Nomination Committee

Chris Smith
Fayetteville Public Works
Phone: (910) 223-4708
Email: chris.smith@faypwc.com

Chair – Western Section

Brendan Kelley
City of Asheville
Phone: (828) 232-4574
Email: BKelley@ashevillenc.gov

Chair – North Piedmont Section

Melanie Clark
City of Eden
Phone: (336) 627-1009 ext 101
Email: mclark@edennc.us

Chair – South Piedmont Section

Tena Mullis
City of Concord
Phone: (704) 920-5163
Email: mullistm@concordnc.gov

Chair – Southeast Section

Del Coffman
Fayetteville Public Works
Phone: (910) 223-4706
Email: del.coffman@faypwc.com

Chair – Northeast Section

Dail Booth
Greenville Utilities
Phone: (252) 551-1559
Email: boothrd@guc.com

Distribution Officer

Julius Patrick
Greenville Utilities
Phone: (252) 551-1561
Email: patricje@guc.com

2021-2022 Committees

Finance Committee

Board Director: Julius Patrick

Chad Flannagan (Chair)
Leslie Carreiro
Julius Patrick
Sam Molinas
Ken Loflin
Jeff Isley

Professional Development Committees

Board Director: Sam Molinas

Seminars

Steve Pope (Chair)
Jeff Isley
Leslie Carreiro
Mike Richardson
Melanie Clark
Tena Mullis
Dail Booth
Brendan Kelley
Del Coffman
Julius Patrick
Allen Daniels

Annual Schools

Sandra Bradshaw (Chair)
Del Coffman
Garrett Gilbert
Tiffanie Hawley

Lab Analyst

Chris Goforth (Co-Chair)
Bernadine Wardlaw (Co-Chair)
Chad Flannagan (Co-Chair)
Jeff Isley
Amy Watters
Dustin Guyer
Erik Ruff
Patricia Quinichett
Elizabeth Meyer
David Livingston

Board of Examiners

Pat Irwin (Chair)
Rani Holland
Jason Green
Julius Patrick
Chris Smith
Jordan Curles
Dail Booth
Yama Jones
Patty Hall
Janet Mills

Public Image Committees

Board Director: Allen Daniels

Member Services

Ian Stroud (Chair)
Chad Flannagan
Julius Patrick
Tena Mullis
Melanie Clark
Del Coffman
Dail Booth
Brendan Kelley
Gabe Sasser
Dave Banick
Sam Molinas
Ken Loflin

Operator of the Year Award

Jeff Isley (Chair)
PWS Representative - Joey White
Charlie Colie

Leadership Committees

Board Director: Steve Pope

Nominating

Chris Smith (Chair)
Tena Mullis
Dail Booth
Melanie Clark
Brendan Kelley
Del Coffman

Rules

Mack Edmisten (Chair)
Chris Smith
Jay Van Hoose

Heather Cagle, Administrator
 N.C. Waterworks Operators Association
 PO Box 5466
 High Point, NC 27262
www.ncwoa.com

NON PROFIT ORG
 U.S. POSTAGE
 PAID

Important Phone Numbers & Websites

Main Phone # for Certification Board	919-707-9040	https://deq.nc.gov/about/divisions/water-resources/operator-certification/drinking-water-operator-certification/dw-operator-certification-wtfocb
Bob Midgette, PWS Section Chief	919-707-9088	
Linda Raynor, Compliance Services Branch	919-707-9095	
Jay Frick, Operations Branch	919-707-9102	
Rebecca Sadosky – Protection & Enforcement Branch	919-707-9096	
Bethany Goodwin, PWS – Consumer Confidence Reports	919-707-9079	
Public Water Supply Offices:		www.deh.enr.state.nc.us/pws
<i>Central Office</i>	919-707-9100	
<i>Asheville</i>	828-296-4500	
<i>Mooresville</i>	704-663-1699	
<i>Winston-Salem</i>	336-776-9800	
<i>Raleigh</i>	919-791-4200	
<i>Fayetteville</i>	910-433-3300	
<i>Washington</i>	252-946-6481	
<i>Wilmington</i>	910-796-7215	
NC State Laboratory of Public Health	919-733-7308	
SDWA Hotline	800-426-4791	
EPA SDWA Website		www.epa.gov/safewater
EPA Microbial & DBP Data from Drinking Water Systems Website		www.epa.gov/enviro/html/icr
NC Waterworks Operators Association (NCWOA)	252-764-2094	www.ncwoa.com email: heather@ncwoa.com
NC Rural Water Association	336-731-6963	www.ncrwa.com
NC AWWA-WEA	919-784-9030	www.ncsafewater.org



This newsletter is printed on recycled paper.