

# Field to Lab to Process Testing for Chlorine and Turbidity

This workshop is designed to teach proper analytical techniques for systems using chlorine for disinfection. Analytical technologies covered in the workshop will be colorimetry analysis for chlorine using the Pocket Colorimeter II, DR900 colorimeter, and DR1900 spectrophotometer for field and lab testing; and CL17 and CLT10 for process testing. Technology covered for turbidity will be 2100Q, TL23, and TU5200 for lab analysis, and 1720E and TU5400 for process testing.

Test parameters analyzed will be free chlorine, total chlorine, and turbidity. An ultra-low range chlorine procedure will be demonstrated with a DR1900 and a pour-thru cell. The course objectives will be met by presenting test theory, incorporating practical applications of analytical techniques with "hands-on" experience with test systems. Students are required to analyze water samples of known and unknown values. Attendees have the option to bring their own instrument to class.



<p><b>8:00 - 8:30</b>      <b>Registration and Introduction</b></p> <p><b>8:30 - 9:00</b>      <b>Basics of Colorimetry</b></p> <p><b>9:00 - 9:30</b>      <b>Introduction to Chlorine Monitoring</b> Forms of chlorine, GLP, Sampling, Reagent Care, Interferences</p> <p><b>9:30 - 10:00</b>    <b>Introduction to the Instrumentation</b> Introduction to operations of lab instrumentation Procedure differences between HR, LR, ULR</p> <p><b>10:00 - 10:15</b>    <b>Break</b></p> <p><b>10:15 - 10:30</b>    <b>Hands-on Lab (1)</b> Total chlorine test on unknown and comparison of results</p> <p><b>10:30 - 11:15</b>    <b>Hands-on Lab (2)</b> Verification of the Function of the Instrumentation Primary standard Chlorine standard vs permanganate Spike primary standard Secondary Standards Recall stored values</p>	<p><b>11:15 - 11:45</b>    <b>Process Analyzers for Chlorine Analysis</b> CL17 CLT10</p> <p><b>11:45 - 12:15</b>    <b>Hands-on Lab (3)</b> Verification of CL17 Process Instrumentation</p> <p><b>12:15 - 1:00</b>      <b>Lunch</b></p> <p><b>1:00 - 1:30</b>      <b>Introduction to Turbidity</b> Lab instrumentation</p> <p><b>1:30 - 2:00</b>      <b>Hands-on Lab (4)</b> Lab instrumentation</p> <p><b>2:00 - 2:15</b>      <b>Break</b></p> <p><b>2:15 - 3:00</b>      <b>New EPA Turbidity Methods</b> TU5 series Instrumentation</p> <p><b>3:00 - 3:30</b>      <b>Hands-on Lab (5)</b> TU5 Series Lab and Process</p> <p><b>3:30 - 3:45</b>      <b>Final questions and Conclusion</b></p>
--	--



## Registration form for Field to Lab to Process Testing for Chlorine and Turbidity

Please Print or Type – This class is worth 6 contact hours for DW &/or WW Certifications

NAME (First, Middle, Last): \_\_\_\_\_ Nickname (For Tag) \_\_\_\_\_

SOCIAL SECURITY #: XXX-XX-\_\_\_\_\_ EMPLOYER: \_\_\_\_\_

MAILING ADDRESS \_\_\_\_\_

CITY: \_\_\_\_\_ COUNTY: \_\_\_\_\_ STATE: \_\_\_\_\_ ZIP: \_\_\_\_\_

WORK PHONE: \_\_\_\_\_ Ext: \_\_\_\_\_ FAX: \_\_\_\_\_ EMAIL: \_\_\_\_\_

NC WATER TREATMENT CERTIFICATE TYPE:  AS  BS  CS  AW  BW  CW  DW  AD  BD  CD  DD  CC/BF  None

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

WASTEWATER CERTIFICATION # \_\_\_\_\_

**Cost & Location - Place a check next to the seminar location where you would like to attend. Applications must be received by July 11.**

Cost: \$180.00      Locations:     July 25, 2017 – Randleman     July 26, 2017 – Wilson

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 \$20 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.

**CONTACT HOUR INFORMATION:** Each of the seminars are worth 6 contact hours and have been PRE-APPROVED by the NCWFPO Certification Board for Water Treatment Facility Operators continuing education hours and by the Wastewater Commission for Wastewater continuing education hours.

### 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 cindy@ncwoa.com to your email address book.

NCWOA USE:    Amount: \_\_\_\_\_    CK# \_\_\_\_\_    E    S    Processed: \_\_\_\_\_

### PLEASE SEND APPLICATION AND PAYMENT TO:

Cindy Gall, NCWOA Comptroller  
PO Box 4519, Emerald Isle, NC 28594  
Phone: 252-764-2094 ext. 2    Fax: 252-764-2095  
Email: [cindy@ncwoa.com](mailto:cindy@ncwoa.com)

# NCWOA Seminars with Proposed Agendas

All NCWOA seminars listed on pages 6-7 are for 6.0 contact hours and are pre-approved by the NCWFOCB 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. Registration form is available on page 9. Seminar agendas and locations are tentative and may be subject to change.

## Pumps & Distribution

April 13, 2017 in Mooresville

8:00 – 8:30	Registration & Welcome	12:45 – 1:30	Distribution Valve Maintenance
8:30 – 9:15	Pump Management & Pressure Strategies (Fixed Motors vs. VFDs)	1:30 – 2:15	Working with Your Fire Dept. to Manage Water Age
9:15 – 10:00	Selection & Maintenance of Pumps	2:15 – 2:30	Break
10:00 – 10:15	Break	2:30 – 3:15	Planning Distribution System Flushing
10:15 – 11:00	Regulatory Update from PWSS	3:15 – 4:00	Pressure Zone Management
11:00 – 11:45	Assessment of Plant & Source for Coliform	4:00	6 Contact hours for all DRINKING WATER certifications
11:45 – 12:45	Lunch Provided On-site		

## Lab Tech Day

May 4, 2017 at the McKimmon Center in Raleigh

**Exhibits, Drinking Water Program, Wastewater Program**

**Detailed information on our website at [www.ncwoa.com](http://www.ncwoa.com)**

## How To Upgrade Your System or Start a New One!

June 6, 2017 in Waynesville

8:00 – 8:30	Registration & Welcome	12:45 – 1:30	Finding Property for Plants & Wells
8:30 – 9:15	Rules & Regulation Update from PWSS	1:30 – 2:15	Do the Research! Well Locations and Depths
9:15 – 10:00	Permitting Process	2:15 – 2:30	Break
10:00 – 10:15	Break	2:30 – 3:15	Personnel Needed
10:15 – 11:00	Choosing the Right Treatment Techniques	3:15 – 4:00	Entity Structure and other Essentials
11:00 – 11:45	Engineering Design of the System	4:00	6 Contact hours for all DRINKING WATER certifications
11:45 – 12:45	Lunch Provided On-site		

## Remote Lab Tech Day

June 28, 2017 in Carrboro (OWASA)

8:00 – 8:30	Registration & Welcome	12:45 - 1:30	Fecal Coliform – Collert 18
8:30 - 9:15	Lab Safety, Injuries and Illnesses	1:30 - 2:30	Tour: OWASA Facility
9:15 - 10:00	Metals – ICP-MS	2:30 - 2:45	Break
10:00 - 10:45	Upcoming UCMR 4	2:45 – 3:30	Lead and Copper Changes
10:45 – 11:00	Break	3:30 – 4:00	Optimize Plant Performance and Produce for the Best Water Quality
11:00 - 11:45	Jar Testing – Procedures & Demo	4:00	6 Contact hours for all DRINKING WATER and WASTEWATER certifications
11:45 – 12:45	Lunch Provided On-site		

For online seminar registration please check our website [www.ncwoa.com](http://www.ncwoa.com)

# NCWOA Seminars with Proposed Agendas

All NCWOA seminars listed on pages 6-7 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. Registration form is available on page 9. Seminar agendas and locations are tentative and may be subject to change.

## Water Quality Monitoring & Data Analysis from Source to Tap

August 3, 2017 in Eden and December 7, 2017 in Wilmington

8:00 - 8:30	Registration & Welcome	11:45 - 12:45	Lunch (provided on-site)
8:30 - 9:15	Source Water Issues: Groundwater & Surface Water (Typical issues, Chloride & Bromide, Iron & Sulfur Bacteria, Taste & Odor, Brain-eating Amoeba)	12:45 - 1:30	Source Water Monitoring - What's In My Raw Water?
9:15 - 10:00	Groundwater Treatment (Typical issues, Chloride, Bromide, TOC)	1:30 - 2:15	Treatment Plant = Lab & Process Monitoring Tools
10:00 - 10:15	Break	2:15 - 2:30	Break
10:15 - 11:00	Surface Water Treatment (Typical issues, Bromide, TOC, Corrosion Control)	2:30 - 3:15	Distribution System = Water Quality Monitoring
11:00 - 11:45	Distribution (HPC's, Tank Mixing, Flushing, Lead & Copper)	3:15 - 4:00	Turning Data into Knowledge - Reports, Optimization, & Troubleshooting
		4:00	6 Contact hours for all DRINKING WATER certifications

## Pumps & Distribution

August 24, 2017 in Nags Head

8:00 - 8:30	Registration & Welcome	11:45 - 12:45	Lunch Provided On-site
8:30 - 9:15	Regulatory Update from PWSS	12:45 - 1:30	Distribution Valve Maintenance
9:15 - 9:45	Selection & Maintenance of Chemical Feed Pumps	1:30 - 2:15	Working with Your Fire Dept. to Manage Water Age
9:45 - 10:15	Maintenance of High Service Pumps	2:15 - 2:30	Break
10:15 - 10:30	Break	2:30 - 3:15	Planning Distribution System Flushing
10:30 - 11:00	Pump Management & Pressure Strategies (Fixed Motors vs. VFDs)	3:15 - 4:00	Pressure Zone Management
11:00 - 11:45	Assessment of Plant & Source for Coliform	4:00	6 Contact hours for all DRINKING WATER certifications

## Fall Certification School

September 25-29, 2017 at the McKimmon Center in Raleigh

**Brochures coming in July**

**For more information check our website at [www.ncwoa.com](http://www.ncwoa.com)**

## Water & Wastewater - Keeping it in the Pipes

November 2, 2017 in Wilson

8:00 - 8:30	Registration & Welcome	12:45 - 1:45	Public Relations - Flushing, Fats, Oils, & Grease and other Customer Notifications
8:30 - 9:30	NC-811 Update & Law Changes	1:45 - 2:45	Valves Installation & Maintenance - Water Lines & Force Mains
9:30 - 10:30	Sewer Main & Water Main Repair	2:45 - 3:00	Break
10:30 - 10:45	Break	3:00 - 4:00	Safety in the Utility Field
10:45 - 11:45	Water & Wastewater Pump Maintenance & Repairs	4:00	6 Contact hours for all DRINKING WATER and WASTEWATER certifications
11:45 - 12:45	Lunch Provided On-site		

# North Carolina Waterworks Operators Association

## 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 #): \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_ (Applies only to seminars indicated with a ^)

**NCWOA MEMBER PRICE IS \$70.00** (Must put your INDIVIDUAL NCWOA membership number on the line above to qualify)

**NON-MEMBER PRICE IS \$100.00** (\*\*Free 2017 NCWOA membership included in this price.) (+Free 2018 NCWOA membership included in this price.)

**Pumps & Distribution - April 13, 2017 in Mooresville	Cost \$ _____
**How to Upgrade Your System or Start A New One - June 6, 2017 in Waynesville	Cost \$ _____
**^Remote Lab Tech Day - June 28, 2017 in Carrboro	Cost \$ _____
**Water Quality Monitoring & Data Analysis from Source to Tap - August 3, 2017 in Eden	Cost \$ _____
**Pumps & Distribution - August 24, 2017 in Nags Head	Cost \$ _____
+^Water & Wastewater - Keeping it in the Pipes - November 2, 2017 in Wilson	Cost \$ _____
+Water Quality Monitoring & Data Analysis from Source to Tap - December 7, 2017 in Wilmington	Cost \$ _____

### Registration information for future seminars will be available in the July issue of Go With The Flow.

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 \$20 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.

**CONTACT HOUR INFORMATION:** Each of the seminars are worth 6 contact hours and have been PRE-APPROVED by the NCWTFW Certification Board for Water Treatment Facility Operators continuing education hours. All seminars marked with a "^" have **ALSO** been pre-approved by the Wastewater Commission for 6 hours.

### 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 cindy@ncwoa.com to your email address book.

**NCWOA USE:** Amount: \_\_\_\_\_ CK# \_\_\_\_\_ E \$ Processed: \_\_\_\_\_

### PLEASE SEND APPLICATION AND PAYMENT TO:

Cindy Gall, NCWOA Comptroller  
PO Box 4519  
Emerald Isle, NC 28594  
Phone: 252-764-2094 ext. 2  
Fax: 252-764-2095  
Email: cindy@ncwoa.com

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