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Wastewater Treatment
Wastewater Collection
Water Distribution
Pump Stations
Water Storage
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As you read this message, we will have completed another successful conference, but one loaded with changes. The changes you witnessed during the conference are just a small sample of the greater changes already underway or soon to come within the North Carolina American Water Works Association-Water Environment Association (Association) as a whole. Change is in the air everywhere. Change can make people uncomfortable and create turmoil. Just between you and me, I am not a big fan of change and I am willing to bet that many of you are like me in that area.

I think most of us resist change if given a choice. However, our Association faces numerous challenges both from within and outside that require us to embrace change. Additionally, when change is approached logically and it follows a mission and vision, it can open up wonderful opportunities and position you for future success. Heck, it can even get me to embrace change.

If that doesn’t help you understand the need for change, maybe one of my favorite quotes from the brilliant Albert Einstein will: “Insanity is doing the same thing, over and over again, but expecting different results.” Put another way, when the world around you is changing, to continue doing the same things you have always done and expecting to keep up could be classified as insanity.

The key is that change is not done randomly and without thought. The Association has embarked on a course that will see a number of significant changes, some have already happened and others are in process and then still others yet to be thought of. Here’s a summary to help you better understand what’s going on and where we’re headed:

1. A new conference program and format in 2011 at a brand new location
   This change has already occurred. Convening the conference at the Embassy Suites in Concord presented new opportunities for a number of program changes.

2. Formation of the SONAR Task Force
   SONAR stands for Sustainable, Outstanding, Nimble, Anticipatory, and Responsive but more importantly it represents a new way to do strategic planning. In the past, our Association has looked at strategic planning every three years with a separate committee and without specific direction or guidelines from the Board. Their work was adopted by the Board and is incorporated into the Business Plan. In 2010, in the second year of a three year Strategic Plan Cycle, a Sustainable Organization Task Force (SOTF) was created by the Board because the 3-year cycle and existing plan did not answer new and evolving questions and concerns about the sustainability of the organization. Now the SONAR Task Force will gather annually and, at the direction of the Board, focus on a few key strategic issues each year. Initially this group is taking its lead from guidance provided by the book ‘7 Measures of Success: What Remarkable Associations Do That Others Don’t.’ In this book, seven key measures of success are presented and will, initially be used as a guide for our Association’s strategic planning. These measures are:
   • Measure 1: Customer Service Culture
   • Measure 2: Alignment of Products and Services with Mission
   • Measure 3: Data-Driven Strategies
   • Measure 4: Dialogue and Engagement – keeping an internal conversation going about volunteers and staff regarding direction and priorities
   • Measure 5: CEO as facilitator of Visionary Thinking by staff
   • Measure 6: Organizational Adaptability
   • Measure 7: Alliance Building

For 2011-12, the Board asked the newly formed SONAR Task Force to look specifically at Measures 2 and 3.

3. A state Board of Trustees more focused on the ‘big picture’
   With the formation of the SONAR task force the state board of trustees is trying to spend less time digging into progress reports and details and more time looking strategically at the ‘big picture’ and thus better anticipating changes in the future. The Board will deal with much more complex, higher-stakes issues that demand more of a response from the Association.

4. The formation of the first Coordinating Councils, similar to AWWA
   There are currently 59 Committees, including all the individual award committees. The current plan would form five Councils, with
the idea being that all the current committees will be aligned below a Council, and will communicate up through the Council. Liaisons would be required to attend Council meetings. The Councils will need to define communication and operating procedures with the committees below. The objective is to reduce staff involvement with individual committees, and use the Councils as the filter for work assignments and communication. This will mean much more responsibility for Committee Chairs and Liaisons but streamline communication in the future.

5. Fewer, but better and more relevant seminars
In the last few years, attendance at seminars has declined. We believe this is a result of 1) constraints the current economy has placed on both participant and staff time and travel and, 2) too many seminars with content relevancy and quality concerns. Each seminar conducted has inherent costs, regardless of the number of participants. This year and into the future, we want to have a tight focus on quality over quantity, to the point that we expect to only provide eight to twelve actual face to face seminars all year. However, we expect those seminars will contain the best, most relevant quality material possible.

6. Providing education and training via e-learning
One of the five Councils noted above would be the Technical Coordinating Council. This Council is made up generally of all the schools, seminars and workshops and technical committees. This Council has been asked to take on the task of investigating and then leading us into the world of e-learning. In the very near future, we would like you to be able to logon to our website and view multiple training modules on a variety of subjects and thus fulfill your training requirements with quality material and without having to travel.

7. Establishing the NC AWWA-WEA Safewater Endowment
Previous Association Chairs, particularly Steve Shoaf and Les Hall had a vision that this Association needed to invest more in the education of a new generation of environmental stewards (after all, that is what we all are). The Endowment committee was formed and now the NC Safewater Endowment is well underway along with several named endowments.

8. Revamping the Association’s website
If you haven’t already experienced it, please visit our newly designed website at www.ncsafewater.org. A special thank you goes out to one of our key staff members, Nicole Banks and the Communication Committee for making this happen. We hope you like it!

9. The use of e-voting
It was less than 10 years ago that every one of the more than 3,000 ballot mailers was put together by hand. I know that because I was the last one to have the task of putting them together. As you know this year and into the future, our elections are all web based. This makes it easier on all members and saves the Association significant time and money.

In following issues, I will give more details on these and other yet to happen changes but, in the meantime, hang on and like me, have faith and trust that in this case, change is a good thing.
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A Gift from Love Canal

Lindsay Roberts, Executive Director

The theme for this issue of our magazine highlights Industrial Pretreatment, which is an extremely important aspect of the water profession, but one that is less well known. While wastewater collection and treatment has been practiced in one form or another for centuries – very rare and simple in Roman times, increasingly complex and available in the last century – Industrial Pretreatment is a very recent addition to the process, but absolutely vital. Lest we forget the traumatic events that helped make Industrial Pretreatment a requirement, I thought it worthwhile to glance back 40 years and recognize that Love Canal did, in fact, deliver a profound gift to the nation in the form of a push to find sources of water pollution, and take action to start cleaning at the source. That in just 40 years, we have reclaimed so much of our water as drinkable, swimmable, and fishable is a tribute to the men and women whose work is Industrial Pretreatment.

The preface to the EPA ‘Introduction to the National Pretreatment Program’ notes that the arrival of the industrial age brought with it, a level of pollution unlike anything ever seen. It was not just the dead and dying fish; deformed birds; but rising concern about abnormally high rates of disease and birth defects in areas affected by chemical pollutants. By 1962, with the publication of her book Silent Spring, Rachel Carson riveted the attention of the public and initiated a national dialogue about the consequences of pollution and what could be done to stem that flow.

And then came Love Canal, raising the crescendo of discourse about water contamination by many decibels.

The Canal was named for William T. Love, who began digging it in the early 1890’s and completed a section of just one mile stretching north of the Niagara River before funds ran out. Gradually, the canal filled with water, and children swam there. By 1920, the canal was a dumpsite for the City of Niagara Falls. By the 1940’s the US Army was using the site to dump war-manufacturing waste and finally, from the 1940’s through 1953 when it ceased using it, the Hooker Chemical Company disposed of 21,000 tons of chemical waste into the abandoned canal.

Niagara Falls City School District tried to purchase the land for a school to deal with expanding population, but Hooker Chemical refused, citing safety concerns because of the buried waste. Eventually, Hooker was forced to sell the land, but it charged only a dollar, and in the deed of sale, it included a seventeen-line statement explaining the danger of building on the site and recommending that the area be sealed off, to prevent exposure of people or animals to the material in the dump.

Never the less, the School District did build – two schools, and then resold some of the land for houses.

In the process of constructing gravel sewer beds, construction crews broke through the clay seal on the toxic materials in the canal, and breached the canal walls.

The local government also removed part of the protective clay cap to use as dirt fill for the second school they were constructing and ran water lines through the dump-sites clay walls. Rainwater flowed through the compromised clay cap and toxic waste washed through the gaps created in the walls.

A Love Canal Homeowners Survey reported that 56% of children born in the area between 1974 and 1978 had at least one birth defect, and EPA confirmed that exposure to toxic materials was causing industrial workers to be stricken by nervous disorders and cancers and that those chemicals were found in the milk of nursing mothers.

The enormity of Love Canal, its impact on children, and the failure of government entities – not just to apprehend the risks, even when told directly about them, but their exacerbation of the risk by deliberately breaching containment of the toxic waste, contributed mightily to a push for analysis of the issues, new regulation, and for vastly better management and mitigation.

The EPA was formed in 1970, by executive order of the President, and in 1972, Congress passed the Clean Water Act, with the goal of restoration of the nation’s waters. One of the key components of the CWA is the National Pollution Discharge Elimination System (NPDES) which requires that direct “point source” dischargers to the waters of the US obtain permits from the EPA, which specify the effluent quality to be produced.
by the treatment process. As water industry professionals, we know that Publicly Owned Treatment Works (POTW's) are designed to treat domestic sewage – and biodegradable commercial and industrial waste. Primary treatment is intended to remove large inorganic solids such as rags and debris. Secondary treatment removes organic contaminants by using microorganisms to consume biodegradable organics. Then, depending on effluent discharge requirements, may come advanced treatment, such as nitrification, denitrification and physical-chemical treatment – and the cleaned water goes back to a natural body of water – a lake, a stream or the ocean.

We also know that POTW's are not designed to treat toxic pollutants, or complex flows from modern industrial sources. So, to avoid the adverse impacts of those discharges on the POTW, and/or the receiving waters, a national pretreatment program has been put in place, which requires Industrial Users to get permits to discharge wastewater to the POTW.

And so, we come to industrial pretreatment. To achieve their own effluent quality requirements in their own NPDES permits, the POTW regulates must, in turn, regulate the significant industrial users (SIU's) – the line blurs, and we are two legs, joined at the hip.

Fast-forward to 2011, and we find that there are more than 16,000 sewage treatment plants in the US, treating more than 32 billion gallons of wastewater per day. 1,600 Publicly Owned Treatment Works (POTW's) have EPA approved pretreatment programs and there are a total of 22,827 significant industrial users (SIU's) discharging to sewage treatment plants in the US.

Neither the POTW nor SIU can now operate as required without the other, and the knowledge sharing and working relationships between the two have flourished. There is much to be proud of. While the creation of a second leg of water treatment may have come as a result of an Executive Order in the face of appalling contamination, for the most part, the two legs have now worked out a pretty good gait, and the health of our water, of our children, of our environment, reflects it.

We can’t turn on the TV these days, without hearing the drumbeat of “jobs, jobs, jobs.” Industries are vital to us if we are to have those jobs, jobs, jobs. I think the lesson we can all take away from this short retrospective of Love Canal’s gift in helping promote Industrial Pretreatment is that when we focus on accomplishing a single goal, and we work together, we can accomplish mighty big things – the cleaning and protection of our waters is a worthwhile life’s work, and the value of that work, delivered to the people of our State by North Carolina’s Industrial Pretreatment specialists, working with our POTW’s, is beyond price. This partnership helps make it possible for us to have it all – clean water AND jobs.
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Seminars Report
By Lisa Joyce, NC AWWA-WEA Membership & Seminars Coordinator

As fall came to an end and winter began to set in, the Seminars and Workshop Committee held the last training seminars of the year. September saw two seminars held in Clemmons, NC, with 54 attending Understanding Your SCADA System and Managing Those ‘Annoying’ Alarms, and another 22 attending the Safety and Health Seminar. December 1, we headed to Statesville, NC for the Construction Issues in Today’s Market seminar. The last seminars of the year were held on December 13, in Wrightsville Beach, NC with Pipeline Assessment and the second Safety and Health Seminar.

As the 2011 training calendar comes to a close, we would like to again thank all of the volunteer committees, coordinators and speakers that have made our training programs so great. The Seminars and Workshop Committee is hard at work planning for the coming year and look forward to serving your training needs to fulfill your professional development requirements. Be sure to visit www.ncsafewater.org for the most up to date information or call the office at 919-784-9030.

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<tr>
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<th>EVENT</th>
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<th># ATTENDED</th>
<th>COMMITTEE</th>
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<tbody>
<tr>
<td>February 22, 2011</td>
<td>NC AWWA-WEA Seminar: Saving Money With Sustainability</td>
<td>Embassy Suites Concord Convention Center – Concord, NC</td>
<td>24</td>
<td>Sustainability</td>
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<td>March 8, 2011</td>
<td>NC AWWA-WEA Seminar: Facing Water Reuse Challenges</td>
<td>UNC Charlotte Student Union Building – Charlotte, NC</td>
<td>78</td>
<td>Water Reuse</td>
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<td>April 13, 2011</td>
<td>Water Treatment Plant Optimization Seminar</td>
<td>D.E. Benton WTP – Raleigh, NC</td>
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<td>June 7, 2011</td>
<td>Wastewater Treatment Plant Optimization Seminar</td>
<td>Neuse River WWTP – Raleigh, NC</td>
<td>40</td>
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<tr>
<td>June 23, 2011</td>
<td>Western Regional Training Day</td>
<td>Hickory Metro Convention Center – Hickory, NC</td>
<td>29</td>
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<tr>
<td>July 19, 2011</td>
<td>Stormwater Effects for Water and Sewer Projects</td>
<td>Bryan Park – Greensboro, NC</td>
<td>24</td>
<td>Young Professionals</td>
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<td>July 26, 2011</td>
<td>Drinking Water Rules &amp; Regulations</td>
<td>McKimmon Center – Raleigh, NC</td>
<td>77</td>
<td>Seminars &amp; Workshops</td>
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<tr>
<td>Aug 11, 2011</td>
<td>Back to the Basics Seminar</td>
<td>City Hotel and Bistro – Greenville, NC</td>
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<td>Seminars &amp; Workshops</td>
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<td>Aug 11, 2011</td>
<td>Effective Utility Management</td>
<td>City Hotel and Bistro – Greenville, NC</td>
<td>50</td>
<td>Finance &amp; Management</td>
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<td>Aug 24, 2011</td>
<td>Eastern Regional Training Day</td>
<td>McKimmon Center – Raleigh, NC</td>
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<td>Seminars &amp; Workshops</td>
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<td>Sept 20, 2011</td>
<td>Understanding Your SCADA System and Managing Those “Annoying” Alarms</td>
<td>Village Inn – Clemmons, NC</td>
<td>54</td>
<td>Automation Committee</td>
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<td>Sept 20, 2011</td>
<td>Safety &amp; Health Seminar Series</td>
<td>Village Inn – Clemmons, NC</td>
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<tr>
<td>December 1, 2011</td>
<td>Construction Issues in Today’s Market</td>
<td>Statesville Civic Center – Statesville, NC</td>
<td>95</td>
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<td>December 13, 2011</td>
<td>Pipeline Assessment</td>
<td>Holiday Inn – Wrightsville Beach, NC</td>
<td>81</td>
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<tr>
<td>December 13, 2011</td>
<td>Safety &amp; Health Seminar Series</td>
<td>Holiday Inn – Wrightsville Beach, NC</td>
<td>81</td>
<td>Safety Committee</td>
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Schools & Conferences Report
By Catrice Jones, NC AWWA-WEA IT Manager & Schools Coordinator

Last year, 2011, was an eventful year for our schools and conferences program. Overall, we offered 2 conferences with a total of 1,662 attendees, and 8 schools where 1,605 students prepared for their certification exams. While the number of schools offered did not change (3 collection/distribution, 2 biological wastewater, 1 physical/chemical wastewater, and 2 maintenance technician), the Maintenance Technologist Schools expanded to include Class III certification. The Maintenance Technician certification program has been well received and plans are underway to continue expansion of the program with the addition of the Class IV certification level in 2013. Hurricane Irene’s visit in August threatened the popular Coastal Collection & Distribution School, but we were fortunate that Carteret Community College sustained minimal damage and classes were able to take place as planned. The Sheraton Atlantic Beach, traditional host hotel for the school and the location of the Student Banquet, was damaged and...
unavailable for the school causing some last minute changes in plans. Thanks to our great coastal volunteers, alternate hotels and a Student Banquet location were found. Bringing our largest event, the Annual Conference, to the Embassy Suites in Concord required planning committees and staff to rethink our traditional conference schedule and layout to maximize the Embassy Suites’ resources. Two exciting changes to the 2011 conference were the expansion of the Technical Program to include sessions running all day with an open buffet lunchtime and the addition of the Chair’s Dessert Reception on Monday night to benefit the NC Safewater Fund.

Our schools and conferences play an important role in educating water and wastewater professionals in NC. Part of the strength and value of our programs comes from the fact that professionals currently working in the industry develop them. Great thanks goes to the many individuals who have chosen to take time away from their jobs, families and other activities to take care of the many details involved in producing a large school or conference. In a world so focused on the economy and budgets, the contribution of exhibitors and sponsors cannot be ignored. Both groups contribute funds that help reduce costs for attendees. Exhibitors further enhance an event by adding a hands-on element and bringing the latest technology right to attendees.

If you missed the opportunity to help with a school or conference in 2011, there is still plenty of time to get involved for 2012! Visit www.ncsafewater.org to find the appropriate committee chair or contact the NC AWWA-WEA office at 919-784-9030.

Dates for most of our 2012 schools and conferences are set and can be found in the Schedule of Events on pages 80-81. Look for school registration details to appear in quarterly Training Catalogs and conference information to come out in conference specific brochures a few months before each conference. All information will also be posted on www.ncsafewater.org as it becomes available throughout the year.

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<th>DATE</th>
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<tr>
<td>March 14-18, 2011</td>
<td>Eastern Collection and Distribution School</td>
<td>NCSU McKimmon Center – Raleigh, NC</td>
<td>447</td>
<td>Collection &amp; Distribution School</td>
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<tr>
<td>March 27-29, 2011</td>
<td>10th Annual Spring Conference</td>
<td>Wilmington Convention Center – Wilmington, NC</td>
<td>477</td>
<td>Annual Conferences Coordinating, Spring Conference subcommittees</td>
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<td>May 2-6, 2011</td>
<td>Eastern Biological Wastewater Operators School</td>
<td>NCSU McKimmon Center – Raleigh, NC</td>
<td>157</td>
<td>Wastewater Operators Schools Committee</td>
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<td>May 3-6, 2011</td>
<td>Physical/Chemical Wastewater Operators School</td>
<td>NCSU McKimmon Center – Raleigh, NC</td>
<td>53</td>
<td>Wastewater Operators Schools Committee</td>
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<tr>
<td>June 1, 2011</td>
<td>Wastewater Laboratory Analyst Exam</td>
<td>WPCC – Morganton, NC</td>
<td>16</td>
<td>Wastewater Laboratory Analyst Committee</td>
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<tr>
<td>July 11-15, 2011</td>
<td>Western Biological Wastewater Operators School</td>
<td>WPCC Foothills Higher Education Center – Morganton, NC</td>
<td>90</td>
<td>Wastewater Schools Committee</td>
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<td>July 11-14, 2011</td>
<td>Maintenance Technologist School &amp; Exam – Grades 1 &amp; 2</td>
<td>WPCC Foothills Higher Education Center – Morganton, NC</td>
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<td>Plant Operation &amp; Maintenance Committee</td>
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<td>Aug 1-5, 2011</td>
<td>Western Collection &amp; Distribution School</td>
<td>WPCC Foothills Higher Education Center – Morganton, NC</td>
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<td>Collection &amp; Distribution Schools Committee</td>
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<td>Aug 29-Sept 1, 2011</td>
<td>Maintenance Technologist School and Exam – Grades 1 &amp; 3</td>
<td>Neuse River WWTP – Raleigh, NC</td>
<td>108</td>
<td>Plant Operations &amp; Maintenance Committee</td>
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<tr>
<td>October 10-14, 2011</td>
<td>Coastal Collection &amp; Distribution School</td>
<td>Carteret Community College – Morehead City, NC</td>
<td>353</td>
<td>Collection &amp; Distribution Schools Committee</td>
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<td>November 13-16, 2011</td>
<td>91st Annual Conference</td>
<td>Embassy Suites – Concord, NC</td>
<td>1,185</td>
<td>Annual Conferences Coordinating, Annual Conference subcommittees</td>
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<td>December 7, 2011</td>
<td>Wastewater Laboratory Analyst Exam</td>
<td>Wilson Community College – Wilson, NC</td>
<td>19</td>
<td>Wastewater Laboratory Analyst Committee</td>
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2011 Collection & Distribution School Exhibitors

- AquaKote USA
- Bio-nomic Services, Inc.
- Bost Argo/Centaur
- D E S P
- Dorsett Technologies, Inc.
- Hach Company
- HD Supply
- Heyward Incorporated
- Interstate Utility Sales Inc
- Jet-Vac Sewer Equipment Co, Inc
- Johnston Inc
- Johnston, Inc.
- Mainline Supply Co
- Maryland Biochemical Co.
- Master Meter
- Mechanical Equipment Company
- NCWOA
- Rain For Rent
- Rodders & Jets Supply Co
- Safety Concepts Inc.
- Southern Corrosion, Inc.
- Southern Municipal Equipment
- TP Environmental Products & Services, LLC
- Wk Hile Company Inc

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It’s Good to be Green: Project Funding and Sustainability in a Down Economy

The sustained downturn in the economy has caused many utility systems to cut their budgets. At the same time, many traditional funding opportunities have diminished as state and federal budgets have been affected by the recession. More than ever, utilities are looking for ways to be more efficient by turning to sustainable solutions. For example, water billing is increasingly being done by automated reading technologies, operators are looking for more ways to optimize power and chemical usage, and funding agencies have followed suit by encouraging “green” projects in various funding programs.

This seminar will lead utility directors, operators and engineers through an examination of modern sustainable technologies and practices, and investigate the future priorities of state and federal funding agencies.

February 2012 in Raleigh, NC

“Green” projects putting more “green” in utility system budgets.

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The following actions were taken during this meeting:
1. The Board approved the Reports with the following highlights:
   a. Approval of a resolution in honor of Lee S. Dukes, who passed away in June.
2. The Board approved the forming of new councils to increase the level of volunteer oversight and coordination of committee work and will eliminate silos that result from a lack of flow of timely information.
3. The Board approved a revised alcoholic beverage policy to allow a cash bar at the exhibit social that includes hard liquor but the free drink ticket provided with registration may not be used to purchase hard liquor, only soft drinks, water, wine or beer.
4. The Board approved amending the clay shoot liability language from the proposed contract or securing a different location if the vendor does not agree. If acceptable to the vendor, a waiver to absolve NC AWWA-WEA must be drafted by legal counsel and signed by all participants at the clay shoot.
5. The Board approved maintaining the existing web-based exhibit booth registration process which provides a first-come, first-served basis for booth selection process.
6. The Board approved a revision to the signature authorization policy to require two officers signatures or one officer and the executive director’s signatures on all contracts, and/or require legal counsel review of all contracts prior to signature; and require that a letter, executed by the Board Chair, be provided to facilities and vendors with whom the volunteer chair of the committee is authorized to negotiate, stating the board’s authorization for negotiation, and specifying who may sign contracts.
7. The Board approved the Sustainability Committee to conduct a survey of the membership.
8. The Board approved a $5 increase in the NC WEA dues for the Professional, Academic, Corporate, and Executive classifications.
9. Robert Walters, AWWA Director, presented Director Roberts with a plaque from AWWA thanking the Association for our support of the Water Research Foundation.
10. The Board regretfully accepts the resignation of Steve Drew from the Chair-Elect position due to personal and professional obligations and thanked him for his service to the Association.
**EZ2 Big Advantages:**

**Fast Install** - (1 hour or less for 4” – 12”; about 4 hours for larger valves)

**One Cutting Tool** - We mill a 1-5/8”, 120º slot across the top of any sized pipe. Other systems require bulky equipment and a different bit for each size pipe.

**Host Pipe Integrity** - Single slot installation means minimal impact on pipe integrity. Other products weaken pipe by cutting out an entire section.

**Removable Bonnet** - Our built-in isolation valve allows easy removal of the valve bonnet with just a wrench.

**The EZ2 Advantage** - Our expandable Resilient Wedge Gate delivers a closure even with tuberculated pipe.

**All Pipe Types** - Works with perfect or irregular IDs, and all standard & many non-standard materials.

**Simply The Best** - The EZ2 is the easiest & fastest valve to install making it our best insertion valve system on the market today.

**Sizes:** 4” through 24” plus A/C pipe

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**EZ2 Creates Solutions. Other Systems Can Create Problems.**

A recessed design can create a debris collecting flaw in the valve seat. Accumulated materials have stopped full closure of valve.

EZ2 avoids this problem by seating directly on the host pipe surface creating a drip-tight closure even in tuberculated systems.
NC AWWA-WEA Committee Chairs

At the time of publication not all chair positions had been finalized. Names and contact information not available below are available at www.ncsafewater.org and will be printed in future issues of NC Currents.

### Conference Coordinating Council

**BOARD LIAISON:** John Kiviniemi (828) 225-8223  **COUNCIL CHAIR:** Joanie Holvey (919) 212-5923

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<thead>
<tr>
<th>COMMITTEE</th>
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<tr>
<td>Exhibits</td>
<td>Jim Anderson</td>
<td>Spring Conference Program</td>
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<td>Local Arrangements</td>
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<td>Mary Krosby</td>
<td>Conference Alternatives Task Force</td>
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<td>Spring Conference</td>
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### Awards Council

**COUNCIL CHAIR & BOARD LIAISON:** Jackie Jarrell (704) 336-4460

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<td>S-S</td>
<td>Kevin Mosteller</td>
<td>Hatfield Award</td>
<td>Ilke McAliley</td>
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<td>Bedell Award</td>
<td>Howard Kimbell</td>
<td>Kenneth J. Miller WFP Award (WFP)</td>
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<td>Lab Analyst Award</td>
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<td>Ebert Award (Bd of Ed &amp; Ex)</td>
<td>Thurman Green</td>
<td>Plaat/Maflit Award (Membership)</td>
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<td>Educator of the Year Award</td>
<td>Bob Berndt</td>
<td>Safe Drinking Water Act Excellence Award</td>
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<td>Fuller Award</td>
<td>Dave Zimmer</td>
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### Executive Council

**COUNCIL CHAIR & BOARD LIAISON:** John McLaughlin (704) 996-6895

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<td>Archives &amp; History</td>
<td>Chuck Willis</td>
<td>Government Affairs</td>
<td>Jennifer Bell</td>
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<td>John McLaughlin</td>
<td>SONAR</td>
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### External Affairs Council

**COUNCIL CHAIR:** Leslie Jones (704) 373-7131

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<td>Communication</td>
<td>Tom Bach</td>
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<td>George Simon, Jr.</td>
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<td>Laurin Kennedy</td>
<td>Water For People</td>
<td>Ilke McAliley</td>
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<td>Young Professionals</td>
<td>Melinda King</td>
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### Technical Coordinating Council

**COUNCIL CHAIR:** Jonathan Lapsley (704) 342-4546

**BOARD LIAISONS:** Andy Brogden (919) 250-2737  Terry Houk (336) 883-3279  Paul Jackson (704) 367-1970  Brian Tripp (828) 327-6911  Mark Wessel (919) 787-5620

### SEMINARS COMMITTEES

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<td>Automation (P.I.)</td>
<td>Don Dickinson</td>
<td>Seminars &amp; Workshops (M.W.)</td>
<td>Betsy Drake</td>
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<td>Disaster Preparedness (P.I.)</td>
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<td>Small Systems</td>
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<td>Finance &amp; Management (B.T.)</td>
<td>Elaine Vastis</td>
<td>Sustainability (P.I.)</td>
<td>Randy Foulke</td>
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<td>Industrial (P.I.)</td>
<td>Chad Ham</td>
<td>Water Resources (P.I.)</td>
<td>Adam Sharpe</td>
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<td>Water Reuse (B.T.)</td>
<td>Patricia Drummey</td>
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<td>Residuals Management / Groundwater (B.T.)</td>
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<td>WW Collection &amp; Water Distribution (B.T.)</td>
<td>Bart Helder</td>
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<td>Safety (P.I.)</td>
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### SCHOOL COMMITTEES

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<td>Collection/Distribution Schools (A.B.)</td>
<td>Geri Brown</td>
<td>Water Board of Education &amp; Examiners (B.T.)</td>
<td>Thurman Green</td>
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<tr>
<td>Plant Operation &amp; Maintenance (M.W.)</td>
<td>Bob Friggs</td>
<td>WW Board of Education &amp; Examiners (B.T.)</td>
<td>Ken Vogt</td>
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<tr>
<td>Professional Wastewater Operators (T.H.)</td>
<td>Monty Payne</td>
<td>WW Treatment Operators Schools (T.H.)</td>
<td>John Dodson</td>
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The following reports are based on information that was current as of September 15, 2011. For more up-to-date information refer to each committee’s web page on www.ncsafewater.org or contact the committee chair directly. Contact information for all committee chairs is available on page 20 of this magazine, or on each individual committee’s page of www.ncsafewater.org.

If you are interested in joining a committee refer to the Volunteer Form on www.ncsafe-water.org or contact the committee’s chair.

Committee Reports

Exhibits Subcommittee
This committee has been quite busy this last quarter.
• Worked and re-worked the Concord Conference Center booth layout to maximize the experience for both exhibitors and attendees. This required several meetings and many phone calls and emails. This was a joint effort between the committee and staff.
• Worked with staff to get the Annual Conference online registration completed and in effect.
• Have listened to and interviewed exhibitors regarding problems with the online registration process. Have had serious complaints from major (i.e. multiple booth purchase) exhibitors.
• Have a meeting scheduled for September 14 for the committee, staff and others to review the process. Will include call ins from IT and legal counsel.
• Have almost completed the RFP for pipe and drape services for the two yearly conferences (asking for 1 year and up to 3 years).

Looking forward, we will review the pipe and drape proposals for the Association, will attend and monitor the Annual Conference, plan for the Spring Conference and bolster the committee’s ranks (we recently had our chair and vice-chair resign due to business commitments).

Awards Committee & Subcommittee
Wastewater Laboratory Analyst Award Subcommittee
A recipient was chosen and reported to Executive Director Lindsay Roberts.

5-S Award Subcommittee
A list of 5-S candidates for induction at this year’s Annual Conference was submitted to Lindsay Roberts.

Piatt/Maffit Membership Award Subcommittee
NC AWWA-WEA staff will look up who qualifies and has won the award.

Board of Trustees Committees
Endowment Committee
The Endowment Committee kicked off its Endowment Fund Raising Initiative for 2011 on July 1. We have 30 members of NC AWWA-WEA meeting with potential donors to educate them about the NC Safewater Endowment Program and to request financial support for the program. As of September 2, 2011, we have received over $35,000 in pledges and cash donations. Reports received from the fundraisers indicate strong support for the endowment program; however, the donations are not matching this indicated support. We are looking forward to a surge in donations in September. We will end this fundraising initiative on September 30, 2011. We are planning to report the results of the fund raising initiative at the Endowment Reception on Monday night at the Annual Conference in Concord. We have prepared a work plan for 2012 and presented it to the budget committee. We are prepared to implement the elements of the work plan that the BOT approves and funds in its budgetary process.

Finance Committee
Finance Committee met on August 23 and September 7 to prepare the 2012 Budget.

Nominating/Canvass Committee
The Nominating Committee has submitted nominees for each of the open positions for the Ballot.

Executive Committee
Executive Committee met on August 23 and September 7 to set the agenda for the September Board Meeting.

Outreach Committees
Water For People Committee
Achievements to Date
• The World Water Corps Team (Patricia Drummey, Lisa Edwards, Mike Parker and Jackie Jarrell) left the USA on August 31st for a ten-day work trip to Bolivia to implement the last phase of
Committee Reports

Advocacy project and FLOW initiative in parts of the project area.
- The Climb For Water Team is currently in Tanzania, on climbing expedition on Mt. Kilimanjaro. The Climb For Water Team has raised over $15,000.

Future Plans
- Members are being offered opportunities to participate in all the fundraising activities and World Water Corps trip.
- Updating the website is an ongoing effort to reach more members and enhance communication. Also Facebook site was created to update the committee members about the events.
- Committee meetings are being held at two locations with conference call participation from various locations.
- Organizing different fundraising activities to involve more people from different industries such as Happy Hour Fundraisers.
- Teamed up with Young Professionals Committee to host a Happy Hour Event at BlackFinn Epicenter in Charlotte, to raise money for Climb For Water on July 29, 2011. The event was a great success, raised over $600 for the Climb For Water Team and attended more than 60 professionals in our industry.

Membership Committees

Membership Committee
Tom Johnson won the WEF Outstanding YP Award. This is the third Young Professional Award from NC. Our future plans include working with staff to update membership trends presentation using database queries; developing Recruitment and Retention Plan; and developing New Member Welcome Packet and new marketing graphics in order to create brand recognition.

Seminars & Workshops Committees

Seminars & Workshops Committee
Achievements to Date
- Coordinated 11 training events in 2011 to date in coordination with other education committees of the Association. Event attendance has been somewhat sporadic but overall financial results of seminars appear to be on schedule.
- Regional training event model has been implemented – one Eastern day held in June and one Western day held in September. Attendance was less than anticipated at both events with certain tracks at the event garnering the majority of attendance.
- Active membership has remained steady
- Planning for the Training Events Calendar for 2012 has begun with contact made to other Association committees; response to date has been moderate. Planning will continue through the 4th Quarter of 2011.
- Recent coordination discussions between the S&W Committee, F&M Committee, and SONAR have raised concerns/opportunities related to how the training/education for the membership is implemented in conjunction with the other education committees. This will be the subject of further discussion as planning for 2012 continues and will be critical to resolving a path for training in 2012 and beyond.

Future Plans
- S&W has 5 remaining training events to be held in 2012.
- Committee volunteers will continue with planning efforts for 2012 including regular committee meetings and individual seminar teams meeting to develop agendas. Involvement from other education committees will be critical to ensuring the calendar is developed in a timely manner.

Water Resources Committee
Achievements to Date
- Held a meeting on August 11th. The speaker was Lars Hanson and he presented on Future Water Supply.
Committee Reports

- Submitted nominations for the Chair and Vice Chair for the Water Resources Committee for 2012 in June 2011
- The Ecological Flows Science Advisory Board will continue to meet monthly through November. It is anticipated that a status report will be provided to the EMC at that time, however the work of the SAB is not likely to be complete. This month, the SAB visited Research Triangle Institute to learn more about their WaterFall model. Still under development, this model pulls from readily available national datasets and can be used for functions such as water allocation planning and ecological flows. A presentation is available on DWR’s website as are other materials including meeting minutes. In addition, Jim Mead provided an updated on his analysis of Eno River data. At the next meeting we hope to compare results from two sites on the Eno to see if habitat response data correlates as we would expect. In general, the SAB is looking at ways to link habitat data.

Future Plans
- Schedule speakers for the remainder of 2011 meetings based on current hot topics in the water/wastewater industry
- Continue to monitor legislation related to water resources issues and coordinate with other groups to advance mutual interests
- Set up a table at the annual conference publicizing the Water Resources Committee
- Possible meet and greet for W/R Committee members at annual conference to attract new members

School Committees

Wastewater Laboratory Analyst Committee
- LABNET: Meetings were held in Burlington and Wilson on June 28 and September 10 respectively. The program consisted of a presentation on method MDLs by Chet Whiting of the DWQ Lab Certification Branch.

Executive Director

The Georgetown County (SC) Water and Sewer District is seeking a strategic leader to serve as Executive Director. With administrative offices located in Pawleys Island, GCWSD serves over 30,000 residential equivalent water, and nearly 23,000 residential equivalent sewer customers, with an operating budget of almost $14 million and a $17.2 million capital budget, including an additional surface water treatment plant along the Black River in western Georgetown County. The District has received the Partnership for Safe Drinking Water 10 year Directors Award and numerous other awards. The Executive Director reports to an appointed seven-member Board of Directors.

More detailed information along with educational and experience requirements, and an application are available at www.gcwsd.com. Residency required within the service district within a reasonable negotiated timeframe. Interested candidates are requested to submit their resume, cover letter, salary expectations and a GCWSD application to Georgetown County Water & Sewer District, Attn: Ruth Pastula, HR Manager, PO Box 2730, Pawleys Island, SC 29585, via email to ruthp@gcwsd.com, or fax to 843.237.1515.

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Committee Reports

Between the two meetings, there were approximately 50 attendees.

- WW Lab Analyst Exam was administered June 1 in Morganton. There were about 20 participants with a combined passage rate of about 68%. The next exam will be in Nov or Dec in Wilson. Applications and exam fees will be handled directly through the AWWA office in the future.

- LAB TECH DAY: The 2011 LAB TECH DAY was held Tuesday May 10 in Raleigh. Topics included analyses of metals and BODs as well as data tracking and sampling. In addition, there was a presentation on a new WW Fecal coliform method by a representative of the USEPA Region 4 office. There were approximately 200 attending between the Wastewater and Drinking Water sections the Wastewater section and comments were overall very positive for the seminar.

**Plant Operations & Maintenance Committee**

Our primary focus has been preparation and delivery of the July Maintenance Technologist School and preparation for the September.

- 2011 Maintenance Schools: Morganton School: Grade I: 27 examined, 26 passed, Grade II: 31 examined, 27 passed Raleigh School: Grade I: 58 enrolled, Grade III: 49 enrolled
- 2012 Schools: Morganton Grades I & III in July 2012 and Raleigh Grades I, II & IV in August 2012 (discussions of need for larger facilities are eminent)
- Annual Maintenance Award Subcommittee meeting to discuss nominations during the week of August 29th.
- Formed 2012 Spring Conference O&M Track Subcommittee with Brandon Garner as chair
- Election of 2012 Plant O&M Committee Chair and Vice-Chair On June 29th - Bob Fritts Chair and Dell Harney Vice-Chair.

**Wastewater Board of Education & Examiners**

Continued amicable collaboration with and receiving concise direction from TACU. Continued diligent efforts on the part of WWBOEE board and advisors. Continued prompt review and response by NC AWWA-WEA to issues referred to it by the WWBOEE. Currently several issues have been referred to the Board of Trustees for discussion/direction/action and are awaiting response: WWBOEE attendance/participation policy; Inability to maintain qualified for appointed WWBOEE seat; WWBOEE officer term limits; WWBOEE officer ascendancy.

**Wastewater Schools Committee**

This committee depends upon volunteers to plan and deliver schools every year. The committee organizes and runs two
In 2011, there were 161 operators in attendance at the school in Raleigh, and 88 operators at the school in Morganton, and 53 operators attended the Physical/Chemical School. It takes over 100 people to teach and monitor the wastewater and physical chemical schools. This year for the first time, the Advanced Wastewater Topics seminar was incorporated into the Regional Training Day held in August. I would like to thank the following people who chaired the committees responsible for setting up the individual schools: Chris White (Hazen and Sawyer), Bob Bernt (Hazen and Sawyer), Katya Bilyk (Hazen and Sawyer), Kenneth W. Bruce (Brown and Caldwell), Christopher Crotwell (Carollo Engineers), Mark Drake (The Wooten Company), John Dodson (City of Durham), Mark Drake (The Wooten Company), David Duty (Pete Duty and Associates), Charles Fiero (Harnett County), Steve Goodwin (CH2M Hill), Robert Griffin (Shield Engineering), Rhonda Hagan Locklear (Town of Pembroke), Joseph D Hughes (Aeration Industries), Jacqueline A. Jarrell (Charlotte Mecklenburg Utilities), Catrice Jones (NC AWWA-WEA), Lee Kiser (Western Piedmont Community College), John Kiviniemi (MSD Buncombe County), Dwight Lancaster (NC Rural Water Association), T.J. Lynch (City of Raleigh), Chris McCorquodale (Town of Siler City), Amy Moore (Town of Holly Springs), Jolene Northrup, L.E. (CHA), Chris Parisher (Town of Cary), Joe Paterniti (Jacobs), Betsy Drake (Town of Cary), Penny Peeler (Western Piedmont Community College), Don Price (NC DWQ), Ray Price (Smithfield Foods), James Proctor (Unifi Kinston), James Pugh (NC DWQ), Jeremy Rees (City of Morganton), Steve Reid (NC DWQ), Hal Schmit (MWH), Steve Shoaf (MSD Buncombe County), Barbara Siford (NC DWQ), George Simon (MWH), Roger Spach (City of Lexington), Tom Spain (City of Henderson), Sandy Tripp (Sterns and Wheeler), Richard Tsang (CDM), David Waggoner (HDR), Mark Wessel (CDM), Arthur White (Hazen and Sawyer), Chris White (Hazen and Sawyer).

The committee’s involvement in this training takes a lot of people and a large investment of time on their part. I believe there may be NC AWWA-WEA members who would like to be involved in this committee in the future. New members are now being recruited for the coming year to help plan, deliver, and moderate the schools that this committee conducts. There is a special need for those that can share their talent as instructors. We need your help. Participation in the committee’s work is an excellent way to network across the wastewater industry and the communities involved. Participation is also a way for Association members to ‘give back’ to the wastewater community. The committee meets approximately once a month from January through August to plan, deliver, and evaluate the schools. If you would like to find out more about the committee, and enlist in its work, visit the Wastewater Operators Schools Committee’s web page, which is linked on www.ncsafeewater.org, to get additional information about our committee and the schools and the committee members.

Finally, I would like to thank the individual members of this committee for making another successful year possible: Billy Allen (Charlotte Mecklenburg Utilities), Reed Atkinson (Charlotte Mecklenburg Utilities), Chris Belk (Hazen and Sawyer), Bob Bernt (Hazen and Sawyer), Katya Bilyk (Hazen and Sawyer), Kenneth W. Bruce (Brown and Caldwell), Christopher Crotwell (Carollo Engineers), Mark Drake (The Wooten Company), John Dodson (City of Durham), Mark Drake (The Wooten Company), David Duty (Pete Duty and Associates), Charles Fiero (Harnett County), Steve Goodwin (CH2M Hill), Robert Griffin (Shield Engineering), Rhonda Hagan Locklear (Town of Pembroke), Joseph D Hughes (Aeration Industries), Jacqueline A. Jarrell (Charlotte Mecklenburg Utilities), Catrice Jones (NC AWWA-WEA), Lee Kiser (Western Piedmont Community College), John Kiviniemi (MSD Buncombe County), Dwight Lancaster (NC Rural Water Association), T.J. Lynch (City of Raleigh), Chris McCorquodale (Town of Siler City), Amy Moore (Town of Holly Springs), Jolene Northrup, L.E. (CHA), Chris Parisher (Town of Cary), Joe Paterniti (Jacobs), Betsy Drake (Town of Cary), Penny Peeler (Western Piedmont Community College), Don Price (NC DWQ), Ray Price (Smithfield Foods), James Proctor (Unifi Kinston), James Pugh (NC DWQ), Jeremy Rees (City of Morganton), Steve Reid (NC DWQ), Hal Schmit (MWH), Steve Shoaf (MSD Buncombe County), Barbara Siford (NC DWQ), George Simon (MWH), Roger Spach (City of Lexington), Tom Spain (City of Henderson), Sandy Tripp (Sterns and Wheeler), Richard Tsang (CDM), David Waggoner (HDR), Mark Wessel (CDM), Arthur White (Hazen and Sawyer), Chris White (Hazen and Sawyer).
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Efficiency is great. Sustained high efficiency is priceless.
More than anyone, Steve Reid knows that working in the wastewater treatment industry requires a range of skills and knowledge acquired through time and experience. Indeed, his personal journey through the industry is one that provides important perspective to his work as an Extension Education & Training Specialist for the North Carolina Department of Environment and Natural Resources Water Quality’s Technical Assistance & Certification Unit (NC DENR – DWQ – TACU).

As one of the staff supporting the Water Pollution Control System Operators’ Certification Commission, Reid sits as an advisor on committees for the NC AWWA-WEA’s Collections and Biological Operator Schools as well as one for the Subsurface Operators School. He is involved in helping develop programs presented at the schools while reviewing curriculum to ensure it is appropriate: that the right material is being taught at the right time, with the right emphasis.

“It is probably one of the most interesting pieces of my job,” he says, pausing only briefly before explaining the other ways he supports the 11-member Commission that handles every aspect of Certification and Training for the 10,000 certified wastewater operators in the State.

Reid and his colleagues are also very actively involved with operator rules and regulations. As such, he is an advisory member of the NC AWWA-WEA’s Wastewater Board of Education and Examiners. As an advisor, Reid helps the board develop new curriculum as well as exam questions that reflect that curriculum.

“It is a very passionate group,” he notes. “They are actively engaged and committed to coming up with the best possible training program for operators in the state.”

Recently, he was invited to join the Environmental Science Technology Advisory Committee for Wake Technical Community College. “At the Community Colleges, they teach the same type of classes we teach through the NC AWWA-WEA,” notes Reid.

He points out that many people who do not go to college will take technical training instead. “To me, the advisory committees are very exciting,” adds Reid. “We don’t have a lot of university graduates in our industry. But there are a lot of people looking for work and this is a great industry to be in. It is something that is always going to be around and that is extremely important.”

However, he adds, at this point, there is still no good conduit for young people on the verge of graduating from high school to discover what the wastewater industry is all about. It was certainly a career path that he never contemplated when he graduated 37 years ago.

After being turned onto marine science by his 10th grade biology teacher, Reid had decided he would be the next Jacques Cousteau. Then, upon graduating from UNC Wilmington with a degree in marine biology, he discovered there were no jobs in his field. Enrolling in graduate school, he completed two years of coursework in the Environmental Health Program at ECU before being offered his first position with the State: as a wastewater treatment plant inspector out of the Washington regional office.

“At that point, the only thing I really knew about the industry was what I had seen in class and through visiting a local WWTP with my advisor,” Reid recalls. “But it was intriguing because it was biology and environmental studies all rolled into one.”

Besides inspecting whether WWTPs were in or out of compliance, he also investigated fish kills and oil spills. It was a good fit, with his biology background proving to be useful more often than not.

Then in 1985 Reid moved to Raleigh to assume a supervisory position with Compliance Enforcement for the entire state. Passionate about his work but frustrated by the politics of enforcement, he then left the State altogether for a four-year stint selling samplers and flow meters for Johnston Inc. This was followed by a nine-year hiatus as a golf pro that ended when he returned to the State in his current position.

Throughout his varied career, he has learned about everything from teaching, to supervision to customer service, all skills he uses in his work today. His job with TACU also includes teaching Laws and Regulations courses at the Operator Schools and assisting with operator disciplinary actions. Although the latter is probably the most difficult part of job, he addresses this challenge by working hard to instill high standards during training.

“To me, one of the other great things about my job is to try to get across to folks that wastewater is not just about sewage,” reflects Reid. “It is about environmental protection. It is something in which operators should take pride.”

Steve Reid:
From Biologist to Wastewater Champion

Member Portrait
Member Portrait

Debbie Soles: There for the Operators

At one point, at every water distribution school, operators will come into contact with Debbie Soles of the NC Water Treatment Facility Operators Certification Board. “I am there for the operators,” she explains. “I am there to answer their questions and listen to any problems they may have. It is like I told them in class one day: ‘If I don’t know the answer, I will find out and get back to you.’”

Soles is on hand to look up how many hours of training they have accumulated. She is the one who prepares the renewal cards and letters sent to operators on an annual basis. (This is the final step in the renewal process, after the other staff members have reviewed and approved the information provided by the operators.) By attending the distribution and cross-connection classes, Soles collects information on what operators need and want from the certification program. “We get a lot of feedback on what they are looking for,” she notes, “and what we can do to make things better if some things aren’t working.”

The exams, she points out, are very tough, with a passing rate of only 50 percent. Operators are allowed to come back to review their exam results on-site, after which the papers are shredded. The hardest moments for Soles are when an operator fails by only one or two points. “Before the exam, I try to tell them to really read the questions carefully,” she says, “not to hurry, but to take their time. I really want to see them succeed.”

Since May 2006, operators are only allowed to take the exam three times before they have to go back to school. Soles reviews all the applications from operators wanting to take the Distribution and Cross-connection exams. “We determine whether they are qualified to take them,” explains Soles.

Before they can take the exam, operators must first attend a week-long board-approved school. “Then, they must obtain their shoring certificate so that when they are out digging ditches and trenches, they can do it safely,” adds Soles. Operators must also provide proof that they have their high school diploma or GED. “And they cannot sit for the first exam until they have six months of experience,” adds Soles. She finds that the main problem with the applications is the lack of detail operators or prospective operators provide about what they do at a water treatment plant. Her role is to ensure that their experience is relevant. Often, with a little prompting, she will get the operators to provide the necessary details of their work: replacing pipes, making taps, maintaining fire hydrants, etc.

Operators are also required to renew their certification on an annual basis. This involves not only paying the fee but also completing six professional development hours. “It must be something relevant to what they do,” Soles explains, adding that most courses related to safety training, mathematics and computers qualify. The Board has pre-approved many courses and encourages operators to choose from this selection.

“We set standards and hold everyone to the same standards,” says Soles. This includes instructors. Soles participates in performing drop-in audits on the classes to ensure they are not sales-based. She enjoys meeting with both the instructors and the operators. Soon she will have more time to interact with them as another part of her job winds down.

For the past eight years, Soles has been managing the Reimbursement Grant (ERG) Program, established to refund expenses to operators working for small water systems serving 3300 persons or less. The ERG program is ending on December 31, 2011.

As she heads closer to retirement, Soles is looking forward to doing more of what she enjoys: first, helping the operators and then, riding motorcycles. Thanks to her Honda Goldwing trike, that prospect is looking very good!
WATER CERTIFICATION QUESTIONS

1. In order to have and maintain excellent public relations with water utility customers, all water distribution personnel should have ________, ________, ________, and ________.

2. All of the following are considered velocity-type or current-type flow meters except ________.

3. One approach to converting dead storage in the bottom of a water tank into useful storage is to ________.
   a. Increase the tank’s capacity   b. Install emergency pumps for fire or other emergencies   c. Allow inflow to the tank when the water level in the tank approaches a high level   d. Use pressure valves

4. Altitude valves are used to prevent tanks from overflowing by allowing inflow to the tank when the water level in the tank approaches a high level. True OR False

Answers:
1. good communications, be caring, courteous: page 478, WSO: Water Transmission and Distribution 3rd Edition
4. False: Water Distribution Systems Handbook, 10.18

WASTEWATER CERTIFICATION QUESTIONS

1. High- pressure jetting hose is made of a continuous polyethylene thermoplastic inner tube, braided webbing, and abrasion-resistance outer covering that is bonded to inner webbing. This outer jacket is available in many different colors such as yellow, orange, blue, red, and black. What does this color code indicate?
   a. Nothing, color is up to preference of the purchaser   b. Indicates the outer diameter of hose   c. Indicates the pressure rating, d. Indicates the manufacturer.

2. Crews are in a subdivision cleaning sewer lines with a combo jetter. Crews are currently cleaning a 6” terracotta line that was installed in late 20’s. Homes in the area were typically built in late 20’s and early 30’s and crews have been unsuccessful in locating clean-outs on the house connections. Pipe lengths are on average 320” in length and the line is approximately 5” in depth. After close inspection of the sewer line it was found to have several inches of silt, sand and gravel type debris in the line. Crew decide to use 80 gpm and 2,500 psi to clean the line. Crew then shoots nozzle from downstream MH to upstream MH a distance of 312’ and starts pulling back the nozzle with full pressure. Crew retrieves nozzle about 60’ and a resident comes running out of a house screaming that the toilet has exploded and water is hitting the ceiling in the bathroom. To prevent more blown toilets when continuing to clean the line, what is the best corrective action the crew should try?
   a. Reduce pressure   b. Reduce GPM   c. Reduce cleaning distance   d. Vent the system

3. What is done with collection system debris, which is dislodged from the lines during routine main cleaning?
   a. It is uncontaminated and may be left near the site of the maintenance   b. It is flushed downstream   c. It is cleaned and redeposited into the collection system   d. It is removed from the collection system and disposed as solid waste.

4. What volume of wastewater spill (SSO) requires a wastewater facility to issue a press release?
   a. 1 gallon   b. 100 gallons   c. 1000 gallons   d. 10,000 gallons

5. What is the pump capacity using the following drawdown data – 6 foot diameter well; 2 foot operating range from pump start to pump stop; time to fill from pump off to pump on = 9 minute; time to drawdown from pump on to pump off = 1 minute?
   a. 423 gpm   b. 470 gpm   c. 523 gpm   d. 1,879 gpm

6. What is the velocity in ft./sec. in a 6-inch diameter pipe carrying 80 gpm?
   a. 0.5   b. 0.8   c. 0.9   d. 13.3

Answers:
1. c = The outer jacket is color coded according to its pressure rating.
   Yellow 2,000 PSI
   Orange 2,500 PSI
   Blue 3,000 PSI
   Red 4,000 PSI

2. b = is most likely to reduce the chance of “Blown Toilets” but blown toilets can be caused from a combination of GPM, pressure, nozzle angle and system conditions. Nozzles in sewer lines create a tremendous amount of air flow and will pull air from upstream, if there is debris build up, and pipe is full of water this air will escape through house vents and home fixtures causing water blow back from P-traps. In smaller pipes pressure is more important to cleaning than volume of water and in larger pipe, volume of flow is more important than pressure. Make sure crews temporarily remove all clean out caps during cleaning operation as this will help reduce pressure in line.

3. c = Dislodged debris should be removed from the system; otherwise, it may create a blockage elsewhere downstream. It represents a health hazard and should be disposed of in an environmentally acceptable manner.

4. c = 1,000 gallons

   Incoming flow rate = 423 gallons/9 minutes = 47 gpm
   Pump capacity = 423 + (47 gpm)(1 minute) = 470 gallons/1 minute

6. c = V = Q/A
   Q = 80/17.48(60) = 0.179 ft3/sec
   A = [(e)(d)(2)/4 = (e)(0.52)/4 = 0.196 ft2
   V = Q/A = 0.9 ft3/sec

Click Here to return to Table of Contents
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General
The need for a reliable long-term water resource for the Piedmont region was recognized in the 1930’s. In 1986 the Piedmont Triad Regional Water Authority (PTRWA) was formed by Greensboro, High Point, Randolph County, Archdale, Jamestown, and Randleman. The Authority’s Board of Directors was selected at that time to bring the project to fruition. These six governmental agencies have worked together to create the Randleman Regional Reservoir and the John Franklin Kime WTP to meet that purpose. The treatment facility, a publicly owned entity, started providing water to the member communities in October 2010.

The WTP is located on the shores of the Randleman Regional Reservoir in Randleman, NC. Randleman is located in the Piedmont area of North Carolina adjacent to the Triad area (Greensboro, High Point and Winston-Salem). The plant provides potable water to a population of over 367,000. The Kime plant treats 10-12 MGD flow on average and has a maximum day flow of 13 MGD. The facility has a $3.85 M annual operating budget.

Treatment Processes
The key treatment units at the facility are: Raw Water Pump Station, Flash Mix, Super Pulsator Splitter Boxes, two Super Pulsator Clarifiers, four dual media Filters, four Membrane Filtration cells, four Granulated Activated Carbon Contact Chambers (filters), two 3 MGD Clear Wells, and a Finished Water Pump Station.

The treatment process begins at the intake structure in the Randleman Regional Reservoir. This reservoir has a storage area of 3,500 acres. The intake structure has six sluice gates located at multiple levels in the reservoir. Three 200 hp raw water pumps transfer water through a 42 inch water line to deliver the water to the main treatment facility. The main facility is located approximately one half mile from the Raw Water Pump Station (RWPS). Potassium permanganate is added to the raw water line at the RWPS allowing adequate time for proper oxidation before reaching the plant. The water then enters the Flash Mix structure of the facility where aluminum sulfate (alum) is added. In addition, for pH adjustment the plant has the ability to feed sulfuric acid as needed. Between the Flash Mix and the Super Pulsator Splitter Box, polymer is added to form a sludge bed in the Super Pulsator. The water continues to the Super Pulsators and then to the Filters where sodium hypochlorite is added for disinfection. After the filters water travels to the state of the art Membrane Filtration system where four filtrate pumps move the water to the Granulated Activated Carbon Contact Chambers. From the GAC Chambers the water goes to the combined filtrate effluent vault where sodium hypochlorite, sodium hydroxide, and corrosion inhibitor are added before the water enters the clear wells for disinfectant contact time. Post-Clear Well chemical feed includes sodium hypochlorite followed by aqua ammonia to form chloramines for distribution system disinfection. The water then flows to the Finished Water Pump Station to be transmitted to the six customer communities.

Solids Management
Sludge from the Super Pulsator Clarifiers is stored in an 80-foot diameter sludge
thickener clarifier and is then pumped to a sludge belt press for dewatering. The dewatering system includes a conveyor that carries the processed sludge to a drying bed where it is ultimately loaded onto dump trucks for landfill disposal.

**Monitoring and Control**
The SCADA system is the virtual control center a.k.a. “brain” of the treatment facility. The facility features a Factorytalk program control system for the operations of the flow pace dosing for the treatment process. Further, the use of the Wonderware programming system that operates the Membrane Filtration system is also an important aspect of automation of the plant. The combination of this technology and automation delivers a SCADA system that epitomizes state of the art treatment facility automation.

**Challenges**
During its one year of operation this facility experienced a couple of unique situations:
- optimizing flow to six different government agencies and the conversion to chloramines; both have been addressed successfully.

**Personnel**

**Staff**
Operations and Maintenance at the facility is handled by a staff of 11 (includes one woman). Additional staff includes Laboratory staff (2) and Administrative staff (2). Kime WTP operators work 3 days on and 4 off. This schedule is designed to keep Operators from working continuous, long hours which helps reduce the workers’ fatigue.

**Staff Development**
PTRWA offers a 5% salary increase for any employee who can successfully obtain Surface Water Certifications from the State of North Carolina.

**Health & Safety**
The Kime WTP has a full time Safety Coordinator who ensures employees meet all OSHA standards. All chemical shipments are inspected by the Coordinator before any Operators are allowed to unload chemical shipments.

**Other/Unique Attributes**
The most unique aspect of this treatment facility is the state of the art Membrane Filtration system followed by GAC filters. This system filters out contaminants as small as 0.045 microns and provides a multi-barrier system against concerns such as cryptosporidium oocysts. This provides best available technology protection for the PTRWA water partners and their customers.

**Contact Information for More on the Kime WTP**
John Kime (jkime@ptrwa.org) or J. Sparks (jsparks@ptrwa.org); Ph: 336-498-5510.
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ANNUAL CONFERENCE SUMMARY

The 91st Annual Conference was a memorable success, over 1,185 water and wastewater professionals and 130 exhibitors throughout North Carolina arriving in Concord on November 13th to kick off the event held at the Embassy Suites Charlotte-Concord Golf Resort & Spa in Concord, NC.

Three days of educational and recreational activities provided the perfect backdrop for exchanging ideas. Attendees gained a national perspective from guests Sandra Ralston, National Water Environment Federation Trustee and Jerry Stevens, National American Water Works Association President. At the Tuesday Awards Banquet, Kraig Kern from the 2011 Climb For Water team spoke about his experience climbing Kilimanjaro and shared a moving slideshow of photos taken on his journey.

Papers presented during technical sessions on Monday and Tuesday gave attendees the opportunity to learn from others’ experiences. A new schedule running technical sessions all day with no formal lunch break allowed attendees to attend even more sessions and stop for a buffet lunch when they were ready.

Wednesday’s forum discussed “Security and Cyber Security – Securing Our Water and Wastewater Infrastructure in a Post-9/11 World”. If you were unable to attend, or would like to review a paper presented at the conference, most of the papers are available on the Annual Conference page of www.ncsafeewater.org.

Many people and organizations were recognized for their achievements throughout the conference. There were also plenty of activities for attendees with a competitive spirit, including the addition of the Laboratory Event to the annual Operations Challenge. Other events included the golf tournament, pipe tapping contest, operations challenge, and best tasting water contest.

The weather was perfect for the Chair’s Dessert Reception and Endowment Auction with attendees gathered around fire pits eating s’mores and sipping hot beverages as they bid on great live and silent auction items. Throughout the conference, $10,150.33 was raised for the NC Safe Water Endowment Fund. This includes $4,718 in auction proceeds, $3,690 in donations from 5-S members, and $1,742.33 collected by the 2011 5-S inductees.

Thank you to everyone who worked to coordinate the conference and to everyone who attended, including the exhibitors and sponsors. Working together, we created a great conference!

Mark your calendars now and plan to join us for 92nd Annual Conference, November 11-14, 2012 in Raleigh, NC!
CONFERENCE-AT-A-GLANCE

Passing of the Gavel from outgoing chair John Kiviniemi (right) to incoming chair John McLaughlin (left). Photo by Jane Dubois.

Clay shoot participants Michael Stover, Keith Jones, Nick Seeba, and Chris Shamel. Photo by Jane Dubois.

Clay shoot participants Andy Brogden, Allen Williams, Lori Brogden, and Kenny Keel. Photo by Jane Dubois.

Attendees surveying the silent auction items at the Chair’s Endowment Dessert Reception on Monday. Photo by Jane Dubois.

Bluegrass band Grassin’ Around warmed up the crowd before the live auction. Photo by Jane Dubois.

The weather was perfect for attendees to gather outside on the Rocky River Terrace for warm beverages and dessert during the Chair’s Dessert Reception. Photo by Jane Dubois.

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Catrice Jones, Tony Dubois and Robbie Bald at the Chair’s Dessert Reception. Photo by Jane Dubois.

Buddy Edmisten (pictured) and Marty Wilson (not pictured) did a great job as emcees of the live auction. Photo by Jane Dubois.

Operations Challenge team Flow Motion from MSD Buncombe County. Photo by Jane Dubois.

Christopher McGinness and Terry Rolan talking before the Tuesday Awards Banquet. Photo by Jane Dubois.

NC’s only female pipe tapping team, the Asheville Copperheads. Photo by Jane Dubois.

Pipe Tapping team, the COR Tappers from Raleigh. Photo by Jane Dubois.

Operations Challenge Team Grease Lightning from CMUD Greg Morgan, Billy Allen, Donna Slachaik, Robert Fritts, and Bob Norris. Photo by Jane Dubois.

Chairs’ table at the Tuesday Awards Banquet. On the left, John Kiviniemi and his family, and on the right John McLaughlin and his wife. Photo by Jane Dubois.
2011 AWARD RECIPIENTS

Golden Manhole Award
Dave Brown (RJN), Chip Smith (Woolpert), Tony Arnold, Scott Hellrick (ADS Environmental Services)

Collection System of the Year
Large System: City of Concord
Medium System: Orange Water & Sewer Authority

Select Society of Sanitary Sludge Shovelers (SS)
Thurman Green (OWASA), Jonathan S Lapsley (CDM), TJ Lynch (City of Raleigh), Terry L Houk (City of High Point), Kevin Mosteller (HDR Engineering)

Water Distribution
Operator of the Year Award
Michelle Massey (City of Asheville)

Public Water Supply Safe Drinking Water Act Excellence Awards
Large Surface Water: Greenville Utilities Commission

WWTP Operations & Maintenance Excellence Award
East Region: Kinston Regional WRF
Central Region: High Point Eastside WWTP
West Region: City of Hendersonville WWTP

WEF Life Members
William L. Hall, F.S. Schwartz

AWWA Life Members
Russell Brice, Harold Falls, Marshall Gilchrist, David Pond, John Vest

AWWA Gold Water Drop Award
Harold Falls, Henry Forrest, William McCann, Arthur White

Kasey Monroe
Outstanding Service Award
Les Hall

Arthur Sidney Bedell Award
Barry Gullet (Charlotte Mecklenburg Utilities)

William D. Hatfield Award
John W. Gibson (City of Raleigh)

George W. Burke, Jr. Safety Award
Roanoke Rapids Sanitary District

Wastewater Lab Analyst Award
Glenn D. McGirt (City of Burlington)

George Warren Fuller Award
Steve Shoaf (City of Asheville)

Kenneth J. Miller
Water For People Award
Todd Davis (Hazen & Sawyer)

Walter J. Courmon Safety Award
Water and Sewer Authority of Cabarrus County, Mt. Pleasant WTP

Raymond E. “Red” Ebert Award
Sonny Grubb (Davidson Water)

Donald E. Francisco
Educator of the Year Award
Steve Drew (City of Greensboro) and Roger Spach (City of Lexington)

Safe Water Maintenance Technologist of the Year Excellence Award
John L. Hodge (City of High Point)

Industrial Pretreatment Operator
James O. Jones (Covidien)

AWWA Partnership of Sfaewater
Orange Water * Sewer Authority

Carol Bond Scholarship Recipients
College & University Student Scholarships
Grace Camberari (Duke University)
Teresa Long (UNC Chapel Hill)

Stockholm Junior Water Prize, North Carolina Representative
Jennifer Brown, School of Science and Mathematics in Durham

Awards Given By Other Organizations and Recognized at the NC AWWA-WEA Annual Conference

NCWOA Awards
A-Surface Operator of the Year
Russell Ball

B-Surface Operator of the Year
Kevin Yates

C-Surface Operator of the Year
Rhonda Beth Andrews

A-Well Operator of the Year
Terry Goldman

B-Well Operator of the Year
Lamar Williams

C-Well Operator of the Year
Wayne Barton

Outstanding Operator of the Year
Kenneth Loflin

Education of the Year
JD Monroe

Laboratory Analyst of the Year
Gina Kimbel

Wilbur E. Long Awards
Municipal Operator of the Year
Jeffrey D. Mahagan

Industrial Operator of the Year
Donald Ray Albright

Animal Systems Operator
Jim H. Lynch

CONGRATULATIONS TO ALL AWARD RECIPIENTS
### 2011 Contest Winners
**Golf Tournament**
Three way tie with a score of 58.

- **1st** Eric Williams, Keith Pugh, Dale James, Chris Thompson
- **2nd** Andy McNeer, Andy Stumpp, Randy Damm, Paul Briggs
- **3rd** Jack Miller, Scott Huneycutt, Neal Gaston, Christie Putnam

**Longest Drive** – Christie Putnam

**Closest to the Pin**
- #5 – Jack Miller
- #10 – Neil Gaston
- #15 – Paul Briggs

### Clay Shoot
**Top Shooter**: Adam Pickett (Pittsboro) (101 out of 104)

**Top Team**: Adam Pickett (Pittsboro), Alan Oldham (NCRWA), Eric Davis (Burlington) Mark Landis (Schnabel)

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**Clay Shoot**

**Top Shooter**: Adam Pickett (Pittsboro)

**Top Team**: Adam Pickett (Pittsboro), Alan Oldham (NCRWA), Eric Davis (Burlington) Mark Landis (Schnabel)

**Laboratory Events**

- **1st** Grease Lightning - Charlotte Mecklenburg Utilities
- **2nd** Flow Motion - MSD Buncombe County
- **3rd** Sewer Rats - Union County

**Maintenance Event**

- **1st** Flow Motion - MSD Buncombe County
- **2nd** Grease Lightning - Charlotte Mecklenburg Utilities
- **3rd** Sewer Rats - Union County

**Collections Systems Event**

- **1st** Flow Motion - MSD Buncombe County
- **2nd** Grease Lightning - Charlotte Mecklenburg Utilities
- **3rd** Sewer Rats - Union County

**Best Tasting Water Contest**

- **1st** City of High Point
- **2nd** Rocky Mount Water Treatment Plant
- **3rd** Dare County Public Utility Authority

**Student Poster Contest**

- **1st** Xia He - NCSU
- **2nd** Ling Wang - NCSU
- **3rd** Mohammad Shamsul Araf - NCSU

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EXHIBITORS

Seating in the exhibit hall gave attendees the opportunity to meet with exhibitors during the buffet lunches on Monday and Tuesday. Photo by Jane Dubois.
The exhibit hall was a great place to network and keep up with the latest technology developments. Photo by Jane Dubois.
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Industrial Reception
HAZEN AND SAWYER

Pipe Tapping
American Ductile Iron Pipe

Sunday Dinner
HAZEN AND SAWYER
JACOBS
MCKIM & CREED

Monday Lunch in Ex Hall
Kimley-Ham and Associates, Inc.
Brown & Caldwell
Haskell

Tuesday Night Awards Banquet
HAZEN AND SAWYER
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Effective Communications Strategies for Fats, Oil, and Grease for Multifamily Housing and Latino Populations

By: Alan Freitag, Ph.D., Regina Guyer, P.E., Clifton Scott, Ph.D., UNC Charlotte

Sanitary sewer overflows (SSOs) often result from improper fats, oil, and grease (FOG) disposal, and incur significant corrective costs for water utilities (costs that must be passed on to customers) and pose potential public health issues. Consequently, reducing SSOs is in the interest of community members both as residents and utility rate payers. The Environmental Assistance Office at UNC Charlotte, in partnership with the Department of Communication Studies, assisted the Urban Water Consortium with research about effective communications strategies for multifamily housing and Latino populations to yield successful prevention of SSOs. The research leadership team included Clifton Scott, Ph.D., as the principal investigator, Alan Freitag, Ph.D., Maria Oliveira, Ph.D., Regina Guyer, P.E., and Marla Boughton.

The research objective was to gauge levels of issue awareness among the target populations, identify constraints preventing desirable behavioral changes and craft a strategic communication plan to encourage proper FOG disposal. The resulting plan includes recommendations for water utility policy or procedure adjustments to enhance the effectiveness of communication efforts.

Primary qualitative research was comprised of six focus groups in Charlotte and Raleigh with the Latino and multifamily housing populations, interviews with community leaders, especially Latino leaders, and interviews with managers of multifamily apartment complexes in areas most affected by SSOs. Demographics for the six focus groups were as follows: Charlotte – Latinos (women only, in Spanish), (ii) Latinos (men only, in Spanish), (iii) General population women apartment residents in English; Raleigh - Latinos (women only, in English), (ii) Latinos (mixed gender, in English), (iii) General population men apartment residents in English. These focus groups generated data on local perceptions and motivators for FOG disposal behaviors and helped the researchers understand how citizens interpret existing FOG communication materials.

Primary quantitative research involved a survey of 968 Latino and multifamily housing occupants in Charlotte, Raleigh, and Winston-Salem. Secondary research included extensive review of communication literature related to utility issues and Latino communication preferences and characteristics as well as analysis of media coverage of the issue in local, state and national media. Based on research results, including demographic trends, the team recommends the following overall communication strategies:

- Achieving maximum effectiveness will be obtained through layering to systematically move targeted publics from awareness to interest, then to trial and evaluation, and finally to adoption of the desired behavior. Awareness of correct grease disposal habits does not lead directly to behavioral change.
- Shift from media-centered campaign to one equally reliant on traditional and interpersonal channels.
- Opportunities for partnerships with commercial and nonprofit organizations should be explored aggressively.
- Multifamily occupants should be reached primarily through intervening publics such as managers of apartment complexes.
- Communication conduits for Latino publics should include direct, even interpersonal channels, rather than only mass media communication channels. Separate message strategies should be employed for the Latino community, rather than simply translating existing materials into Spanish.
- Research reveals the issue is initially one of awareness and interest. Key publics reflect willingness, even an eagerness to comply with proper grease disposal procedures when they are made aware of the environmental risks of improper disposal. Most audiences only think improperly that it leads to sanitary sewer overflows and contributes to higher water and sewer bills.
• Messages for Latino populations should feature respected community leaders and other notable figures from the greater Latino population.
• Messages aimed toward Latino men should stress the financial costs associated with improper grease disposal; messages for Latina women should stress the environmental damage and health risks of improper disposal.
• Proper disposal should be framed as a positive behavior, and little to no stress should be placed on improper disposal as a negative behavior.
• Utilities should develop mobile displays that can be featured at major events attended heavily by Latinos (soccer matches, festivals, concerts, etc.). Smaller displays would be effective at markets, grocery stores, schools, community centers, etc.

As these strategies are implemented, communication efforts can be enhanced and benefit from economies of scale achieved in several ways. First, the communication plan must reflect synergy in that individual components should reinforce and be reinforced by other components of the plan. Second, the plan should include periodic state-wide measures, supported and reinforced by coordinated localized measures. Third, agencies throughout the state should pool resources whenever feasible to avoid duplication, share creative strengths and reduce costs (translation and printing set-up costs, for example). Recommendations for continued enhancement of the FOG communications include development of these communication strategies and collaborative partnerships with utilities and state agencies across North Carolina.

The research included a detailed communication plan for utilities and communications departments to implement for overall program elements including goals and objectives, communication strategies and tactics including key messages and concepts for specific populations, and a sample timeline for implementation. The focus groups provided meaning insight to individual and cultural perspectives on the important FOG topic, which is detailed with dialogues in the appendices of the electronic versions. The research report is available free of charge by contacting Regina Guyer, Executive Director of the Environmental Assistance Office at UNC Charlotte 9201 University City Blvd, IDEAS/ EAO, Charlotte, NC 28223, rguyen@uncc.edu, 704-687-3968.

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What is the Triennial Review and Why Should You Care?

By: Dawn Padgett and Jackie Jarrell, City of Charlotte and Martie Groome, City of Greensboro

Triennial Review Process – An Introduction
North Carolina is currently in a process of reviewing Water Quality Standards (WQS) through the Triennial Review process. As part of the requirements of the Federal Clean Water Act (CWA), States and US territories are required to establish water quality standards that are appropriate to the waters of their State. To accomplish this goal, the Triennial Review process was established requiring a review every three years – thus “triennial review.”

The Clean Water Act requires EPA to establish “guidelines” for water quality standards to protect the waters of the United States. These guidelines address the extraordinarily diverse eco-system found throughout the fifty states and the US territories. The States are mandated to review the guidelines developed by EPA and determine which standards are appropriate for the waters of their State. If the most stringent guideline is not selected, the State must give a technically sound reason why the guideline is not appropriate. All state water quality standards must ultimately be approved by EPA. The outcome of the Triennial Review can affect regulatory controls for industry and municipalities throughout the State. This article will discuss the current Triennial Review regulatory process the potential economic implications, and if the philosophy of implementation provides true benefit of protection of the waters of the state. There has been a great deal of collaborative work among various organizations, municipalities and industries in hopes of providing issues of concern to the State’s Department of Environment and Natural Resources/Division of Water Quality (DENR/DWQ). The goal is of these groups is to provide for a process that is protective of the state’s waters that is also cost effective and based on sound science. Overall, there are a number of changes included in the Triennial Review, but this article will focus on the proposed water quality standards specifically for lead, cadmium and nickel.

Why Should an Industry Care?
Most industries discharge to a municipal wastewater treatment plant (WWTP). The discharge limits for industrial facilities are based on the ability of the municipal WWTP to treat the process wastewater and still meet NPDES permit limits and WQS. A more stringent WQS will result in lower NPDES permit limits for a WWTP, which in turn will force the WWTP to further limit the amount of the pollutant discharged to the WWTP in order to meet the more stringent limit.

The Triennial Review proposed WQS for cadmium, lead and nickel may require WWTPs to:
• install state of the art treatment systems that are very expensive to construct and operate, passing those costs on to the WWTP customers, or
• reduce the amount of pollutants discharged to the WWTP plant from the only source available – industrial and commercial facilities…once again at a significant cost to industrial customers, or
• some WWTPs may have to use both options in order to comply with more stringent NPDES permit limits

There is a risk that an industry would not be able to meet required limits causing their business to be compromised in some way (i.e. no expansion). Therefore, it is important for industrial facilities to track the Triennial Review process and work with the local WWTP to determine what impacts the process may ultimately have on industrial discharge permit limits. There is also risk to municipalities that the regulations cause industries to relocate to other states and possibly out of the country. While other states are also conducting and implementing a Triennial Review, their process may not produce as stringent regulations. North Carolina municipalities and how they are regulated could “cost” the industries more to operate risking our economic development. Industrial pretreatment programs have an opportunity to educate industries in their communities on this process for the benefit of all involved.

Next Steps in the North Carolina Surface Water Quality Standards Triennial Review Process
DWQ staff presented the proposed Triennial Review regulations to the Environmental Management Commission (EMC) at the March 2010 EMC meeting. The EMC approved the proposed Triennial Review regulations to go to public notice and public hearing. However, the EMC asked that the Fiscal Note (required regulation financial impact report) be prepared and brought back to the EMC for review and approval prior to scheduling the public hearing. Several organizations such as the NC Pretreatment Consortium, the NC Water Quality Association, the NC League of Municipalities, independent municipalities and industries made comment to the DWQ on the fiscal impact of the regulations.
• DWQ is currently preparing the required fiscal note and will present the Triennial Review Fiscal Note for approval at a future EMC meeting.
• Upon EMC approval, the Fiscal Note will be forwarded to the Office of State Budget and Management (OSBM). The Fiscal Note must be approved by that body before the public notice and public hearings can proceed.
After the fiscal note is approved by the EMC and OSBM, DWQ will publish the proposed Triennial Review Regulations in the State Register along with the notice of the public hearing date(s) and location(s). A 15 day notice is required prior to holding a public hearing. EMC appoints the hearing officers.

A public comment period of at least 60 days will begin after the notice is published in the State Register. The dates that DWQ will be accepting public comments will be specified in the register notice. Public hearings will be held as noticed; interested parties may attend and speak at the public hearing and/or provide written comments. Following the hearings, the public hearing record will remain open for written comment through the date published in the State Register.

The hearing officers review all of the comments made during the public hearing process and report their findings and recommendations to the EMC (at an EMC meeting).

Tale of Two Cities: Demonstration of Potential Impacts

The chart below compares the current surface water quality standards to those proposed in the Triennial Review. DWQ has proposed significant reductions for cadmium, lead and nickel and for the first time in North Carolina, the proposed WQS are expressed as “dissolved metals” (per EPA recommendation). However, the Federal NPDES regulations require that all NPDES permit limits be expressed as total metal. DWQ proposes to use a “translator” for that conversion.

DWQ requires each WWTP to calculate the maximum allowable headworks loadings (MAHL) the WWTP can handle without violating NPDES permit limits, violating sludge standards, or endangering WWTP workers. The MAHLs provide the technical basis for all SIU permit limits. In many WWTPs, the MAHL is based on a calculation using the NPDES permit limit and the WWTP removal efficiency for that pollutant. Thus, a more stringent NPDES permit limit will result in a smaller MAHL (which is expressed in pounds of pollutant).

Each MAHL is essentially a “pollutant pie” that must be sliced up and allocated to all sources that discharge the pollutant, including domestic waste sources. In addition, “slices” must be set aside for a safety factor and a growth allocation. The “pie” left over after domestic, safety and growth allocations are removed is called the “Maximum Allowable Industrial Loading” (MAIL)...the amount that is available to distribute to industrial users.

A smaller MAHL due to more stringent NPDES permit limits is usually remedied by reducing the MAIL, since the allocations for domestic households, safety and future growth are essentially fixed. A smaller MAIL of course, means more stringent permit limits for all industrial users discharging to the WWTP.

The following charts present the NPDES permit limit reductions and resulting MAHL impacts at two WWTPs, the City of Charlotte Irwin Creek WWTP and the City of Greensboro T. Z. Osborne WWTP:

“...lead, cadmium and nickel MAHLs used to be ‘pollutant pies’. The triennial review will reduce those pies to cupcakes...but we still have the same number of ‘hungry industries’ to divide them among.”

-Greensboro Pretreatment Staff

The cadmium, lead and nickel MAHLs of many other WWTPs in the state will be reduced in response to the current proposed Triennial Review. The WWTPs located on
CITY OF GREENSBORO T. Z. OSBORNE WWTP

Impact of Proposed Changes on Current NPDES Permit Limits – Greensboro T. Z. Osborne WWTP

<table>
<thead>
<tr>
<th>(T. Z. Osborne is 97% of receiving stream)</th>
<th>Current NPDES Permit Limit (total)</th>
<th>Triennial Review Proposed Water Quality Standard (using “translator” to get total metal)</th>
<th>NPDES Permit Limit using Triennial Review WQS</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cadmium</td>
<td>2.0 µg/l (ppb)</td>
<td>0.59 µg/l (ppb)</td>
<td>0.61 µg/l (ppb)</td>
</tr>
<tr>
<td>Lead</td>
<td>25 µg/l (ppb)</td>
<td>2.94 µg/l (ppb)</td>
<td>3.04 µg/l (ppb)</td>
</tr>
<tr>
<td>Nickel</td>
<td>91 µg/l (ppb)</td>
<td>37 µg/l (ppb)</td>
<td>38.5 µg/l (ppb)</td>
</tr>
</tbody>
</table>

City of Greensboro T. Z. Osborne WWTP (40 MGD)

<table>
<thead>
<tr>
<th>Current MAHL “Pie”</th>
<th>Proposed Triennial MAHL “Pie” Using Translator (Cupcake?)</th>
<th>Percent Reduction of MAHL</th>
</tr>
</thead>
<tbody>
<tr>
<td>Cadmium</td>
<td>1.034 pounds</td>
<td>0.316 pounds</td>
</tr>
<tr>
<td>Lead</td>
<td>31.01 pounds</td>
<td>3.49 pounds</td>
</tr>
<tr>
<td>Nickel</td>
<td>53.84 pounds</td>
<td>22.01 pounds</td>
</tr>
</tbody>
</table>

| Low-flow receiving streams will experience the most dramatic impacts, but the reductions will be across the board for all NPDES permit limit driven MAHLs, regardless of receiving stream flow. |

What Can an Industrial User Do Now?
Learn all you can about the North Carolina Triennial Review Process now. This is a complex issue and will require some time and effort to gather the information necessary to determine the potential impacts on your industrial facility.

- Review your current Industrial User Wastewater Discharge Permit. Does your facility have limits for cadmium, lead and nickel? If so, how many pounds of each pollutant have been allocated to your facility?
- Review the last five years of sampling data for cadmium, lead and nickel from your facility (include self-monitoring data as well as samples taken by your town’s pretreatment program) and compare the results to your SIU permit limits.
- Contact the WWTP that receives your process wastewater. The Pretreatment Coordinator for the town should be aware of the proposed WQS changes included in the Triennial Review and what impacts those changes may have on the town’s NPDES permit limits. The Pretreatment Coordinator may already have used the “DWQ Calculator” to estimate the town’s NPDES permit limits based on the draft Triennial Review regulations and the two of you can review your current SIU permit limits in light of the proposed WQS changes.
- If you currently operate a wastewater pretreatment system to remove any of these metals, investigate the maximum operating efficiency of the system. Can the system be modified to achieve higher removal efficiencies and if so, at what cost?

Links to More Information on the North Carolina Triennial Review
Link to DWQ Planning Section Triennial Review site which includes the proposed regulation and other related documents: http://portal.ncdenr.org/web/wq/ps/csu/swtirev
Link to DWQ NPDES Permitting site which explains how the metals translator is used and how to calculate a total metals limit from the proposed dissolved metal WQS http://portal.ncdenr.org/web/wq/swp/ps/npdes/calc/userguide

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Demonstration Trials of a Rotating Belt Filter Screen at Two Beef Slaughterhouse Facilities

By: George Anipsitakis, Brown and Caldwell

In an effort to find innovative and economical ways to reduce loadings to the main wastewater treatment process, full scale trials were undertaken at two beef slaughterhouses to demonstrate the performance of the Salsnes filter screen in its ability to remove organic matter and solids.

The Salsnes filter screen uses a rotating inclined belt filter with openings from 75 to 1000 microns, and is marketed in the US by Blue Water Technologies, Inc. as an excellent chemical-free mechanical process alternative to screening and/or primary clarification. Basically the equipment separates solids from water. Solids from the wastewater, not being able to go through the belt openings, are deposited onto the rotating inclined belt, whereas water travels through the belt openings to become the screened effluent. Then solids carried by the rotating inclined belt are discharged into a shafted screw conveyor container where they are pressed before exiting the equipment as dewatered cake. The model used at the trials was the smallest available model manufactured, the SF-1000 (Figure 1), and was tested with both unscreened and already screened influent.

Plant A

Trials (see photos below) at Plant A were performed in August 2008 and again in October 2008 (eight operating days in total). At the times of the trials, Plant A was processing approximately 80,000 gallons of wastewater on a typical production day (56 gpm) and two existing screens for preliminary treatment were already operating. The first screen was a stationary wedge wire type that discharged into a second screen consisting of the rotating externally fed type. The Salsnes filter screen was tested both downstream of the existing screens receiving screened wastewater and upstream of the existing screens receiving raw unscreened wastewater. Critical to the operation of the filter screen was the size of the belt openings. In these trials, belt openings tested were 350, 500, and 840 µm, and the feed flor率为te to the screen ranged from 16 to 37 gpm.

Results from the trials at Plant A are discussed below (the numbers in parenthesis correspond to numbers of different samples):

- When the Salsnes screen received raw unscreened wastewater, the average constituent concentrations were as follows: 8,360 mg/L COD (5), 5,680 mg/L BOD₅ (1), and 6,840 mg/L TSS (15). When the Salsnes screen was placed downstream of the existing screens, the wastewater contained an average 6,560 mg/L COD (8), 4,090 mg/L BOD₅ (5), and 4,420 mg/L TSS (5). These values indicate that the existing screens already provide 21.5% COD removal, 28% BOD₅ removal, and 35% TSS removal (Figure 2).
- When the screen received raw unscreened wastewater utilizing a 350 µm belt, the COD removal averaged 23% (5), BOD₅ removal was 41% (1), and TSS removal was 56% (15). These results indicate a better performance of the Salsnes screen compared to the existing screens. Using the Salsnes screen only, COD removal increased by only 1.5%, but BOD₅ and TSS removals increased by 13% and 20%, respectively. Under this set of trials, the thickness of the cake produced ranged from 12 to 26% in solids and had an average of 18% (7) in solids.
- When the screen operated downstream of the existing screens utilizing a 350 µm belt, the COD removal across the Salsnes averaged 15% (7), BOD₅ removal was 42% (1), and TSS removal was also 42% (1) (Figure 3). These results indicate that if one combined the existing screens with the new Salsnes screen in series, the overall constituent removals become 33% for COD, 58% for BOD₅, and 62.5% for TSS (Figure 2).
- When the screen operated downstream of the existing screens utilizing the 500 and the 840 µm belts, only two measurements were collected per each belt size tested. The variability of the results does not allow a safe prediction of the screen performance using these two belt sizes. Under these trials, one cake measurement was 12% in solids (840 µm) whereas the other was 21% (500 µm).
- Calculations for the Salsnes screen, taking into account the then incurred costs in sludge conditioning chemicals and sludge disposal, indicated that a properly sized screen could provide a return on investment of less than one year.
Even though not all combinations of belt sizes and types of wastewater (already screened or unscreened) were tested, results from the Plant A trials indicate that with the Salsnes screen, one can expect greater than 20%, 40%, and 50% removals of COD, BOD$_5$, and TSS, respectively, from raw wastewater of this type using an appropriate size of belt openings. Furthermore, if the Salsnes screen is combined with existing coarser screens, one could expect overall constituent removals of greater than 30%, 55%, and 60% for COD, BOD$_5$, and TSS, respectively. In this case, most tests were run and these removals were attained with a 350 µm belt.

**Plant B**

Trials at Plant B were performed in October 2008 (4 operating days). At the time of the trials, Plant B was processing approximately 12,000 gallons of wastewater on an average production day (8 gpm) and a stationary wedge wire type of screen for preliminary treatment was already operating. The Salsnes filter screen was placed upstream of the existing screen to receive raw unscreened wastewater containing 4,200 mg/L BOD$_5$ (9) and 3,590 mg/L TSS (9). The numbers in parenthesis correspond to numbers of different samples. The feed flowrate to the screen ranged from 19 to 54 gpm, and the different belts tested had openings of the following sizes: 350, 500, and 840 µm.

Results from the trials at Plant B are shown in Figure 4 and are discussed below:

- When the screen was equipped with a 350 µm belt, the average BOD$_5$ removal was 15% (2) and the TSS removal was 37% (2); though the variability of the two TSS results was significant.
- When the screen was equipped with a 500 µm belt, the average BOD$_5$ removal was 26% (5), whereas the TSS removal was 49% (5). Under this set of trials, the thickness of the cake was measured once and contained 18.5% solids.
- Finally, when the screen was equipped with an 840 µm belt, the average BOD$_5$ removal was 19% (2), whereas the TSS removal was 35% (2). Under this set of trials, the thickness of the cake was measured once and contained 26% solids.

As with Plant A, results from the Plant B trials indicate that one can expect substantial constituent removal using this type of screen. Removals equal or greater than 20% and 50% for BOD$_5$ and TSS, respectively, were attained from this facility’s unscreened wastewater. Here, a belt with 500 µm size openings appeared to be the most appropriate option.

**Comparison**

Trials at Plant B were more systematic than Plant A in terms of testing different size belt openings, and suggest that if enough data were collected at Plant A, perhaps a 500 µm would outperform a 350 µm belt at Plant A as well. Much more data, however, was collected using a 350 µm belt from Plant A as compared to the data collected from Plant B.

As expected, tests at both plants showed that solids removal increases with solids concentration in the influent to the Salsnes screen. Solids removal values as high as 90% were recorded at Plant A when the influent TSS concentration reached 17,000 mg/L.

**Conclusions**

In conclusion, the claim of the distributor for similar to primary clarification performance by the Salsnes screen appears to be substantiated by the data collected and discussed in this study. The benefit of matching the performance of a primary clarifier without having to build a tank is undoubtedly significant. In summary:

1. At Plant A, greater than 20%, 40%, and 50% removals of COD, BOD$_5$, and TSS, respectively, were obtained using the Salsnes screen (350 µm).
2. At Plant A, greater than 30%, 55%, and 60% removals of COD, BOD$_5$, and TSS, respectively, were obtained when the Salsnes screen (350 µm) was connected in series with the existing screens.
3. At Plant B, equal or greater than 20% and 50% removals of BOD$_5$ and TSS, respectively, were obtained using the Salsnes screen (500 µm).

As a general guideline for a maximum solids removal, it is advisable to perform field tests to be able to select the appropriate belt opening size that matches the characteristics of the wastewater to be treated. As with Plants A and B, it may be prudent to have at least two belts with different size openings available on-site in order to be able to match potential variability in the characteristics of the wastewater due to varying upstream processing conditions.

**GEORGE ANIPSITAKIS,** PhD, PE is a senior engineer with Brown and Caldwell. The trials described in this article were performed when he was employed with Chastain-Skillman.
Cyanide Impacts to Activated Sludge: Not Always Deadly

By: Kevin D. Torrens, BCEEM, Brown and Caldwell

For those publicly owned treatment works (POTW) that treat a combination of domestic and industrial wastewaters, cyanide is often present in many of the industrial wastewaters. Pretreatment limits are established to prevent interference and pass-through, safeguard worker health and minimize safety, and waste sludge quality impacts. Specific industrial categories also have pretreatment limits (categorical limits) that apply, and the lower of the POTW pretreatment limit or categorical pretreatment limit applies.

The “Guidance Manual on the Development and Implementation of Local Discharge Limitations Under the Pretreatment Program” (December 1987, USEPA Office of Water) provides guidance for the development of local limits. With respect to interference, a minimum reported inhibition threshold of 0.1 mg/L is cited in the guidance for cyanide with a range of 0.1 mg/L to 5 mg/L reported. These values represent the concentration present in the completely mixed aeration basin. Consequently, reductions in the concentration of cyanide from an industrial discharger due to other contributory flow, as well as from removal in the primary treatment processes and aeration basins by biological and other processes, must be considered when determining pretreatment limits. Due to these factors, coupled with data that shows that activated sludge systems will effectively operate at higher cyanide levels than the minimum reported threshold value, a pretreatment limit of 0.1 mg/L is often excessively over-conservative. This is further reinforced by the fact that only a fraction of the cyanide is typically bio-available, with the majority present as cyanide complexes that are unavailable to cause bio-inhibition.

**Cyanide in Wastewater**

The cyanide present in most industrial wastewaters is typically complexed with metals. Each cyanide complex present in industrial wastewaters may exhibit different properties in terms of toxicity and treatability. Cyanide is, however, registered by the Chemical Abstract Services (CAS) as No. 57-12-5 with no differentiation for the various chemical forms.

Cyanide or cyanides refers to the group of simple and complex chemical compounds that can be determined as cyanide ion (CN-). Total cyanide refers to all forms of cyanide, including free [hydrogen cyanide (HCN)] and CN- and complexed cyanide (weakly to strongly bound cyano-metal complexes).

Simple cyanides, such as sodium (NaCN), potassium (KCN), and calcium [Ca(CN)2] cyanides, dissociate completely in the wastewater to the metal ion (K+, Na+, and Ca2+, respectively) and CN-. Then, the CN-hydrolyzes and the proportion of HCN and CN- present in the wastewater is dependent on the pH and the dissociation constant for HCN. The lower the pH the more HCN is relatively present compared to CN-. At neutral or slightly acidic pH, nearly all cyanide is present as HCN (e.g., at pH 7.0, 99 percent of the free cyanide exists as HCN).

Most of the other metal cyanides are insoluble or only slightly soluble in water, but may form a variety of soluble cyanide complexes. Some cyano-metal complexes (e.g., mercury, nickel, and silver cyanides) dissociate partially and only under certain conditions. Other cyano-metal complexes (e.g., zinc and cadmium cyanides) dissociate extensively to the metal ion (Zn2+ or Cd2+) and CN-. Cyanogen-metal complexes for other metals (e.g., ferrocyanide and cobalt and gold cyanides) dissociate only very slightly. The weaker the cyano-metal complex means the greater the availability of the cyanide for the biomass, which yields the greater the potential for aquatic and biomass toxicity.

Analytical methods measure cyanide in two ways: (1) total cyanide and (2) available cyanide. Total cyanide analytical methods attempt to measure all cyanide species, but only measure those cyanide species that can be dissociated under the laboratory test conditions (i.e., reflux distillation in the presence of sulfuric acid and magnesium chloride). The available cyanide methods measure the cyanide species that dissociate in the presence of chlorine (cyanide amenable to chlorination) and/or acid (weak-acid dissociable) or by ligand exchange (Method OIA-1677). In addition, the species of cyanide measured by the available cyanide methods are CN-, HCN, the cyano-complexes of zinc and cadmium, and, to a lesser extent, the cyano-complexes of copper, mercury, nickel, and silver.

The total, partial, or near lack of dissociation presents difficulties not only in the analytical determination of cyanides, but also in the way that activated sludge biomass and aquatic organisms are affected.

**Biological Treatment Processes and Cyanide Interaction**

Treatment of cyanide containing wastewaters using biological processes is well documented in the literature. Typically, the available (free) cyanide is amenable to biodegradation and the complexed cyanide, which is non-toxic to the biomass, does not adversely impact the biological treatment process.

Complexation of the cyanide ion, particularly with iron, forms a stable and less toxic compound as compared to free cyanide. Therefore, complexed cyanide does not have the same affect on the biomass in a biological...
activated Sludge: not always Deadly cyanide impacts to increased the cyanide concentration in the feed was with no cyanide in the feed. As a next step, to the performance of the control reactor complexes. Cyanide at 1 mg/L to 2 mg/L interfered with the performance of trickling filters that were not acclimated; however, acclimated trickling filters were able to process 100 mg/L to 200 mg/L of cyanide.

A laboratory-scale, continuous flow, extended aeration study showed that during the biodegradation of glucose (500 mg/L) in the presence of free cyanide, the biomass responded effectively to increases in the cyanide concentrations (from 0 to 10 mg/L, from 10 mg/L to 15 mg/L, and from 15 mg/L to 20 mg/L). Ultimately, the biomass was able to accommodate these changes without interfering with the removal of glucose or impacting the nitrification process. After several weeks of operation in the absence of cyanide, the system was operated using a feed with 10 mg/L of cyanide for 209 days. The performance of this test reactor was similar to the performance of the control reactor with no cyanide in the feed. As a next step, the cyanide concentration in the feed was increased to 15 mg/L. What was observed initially was leakage of organic carbon into the effluent and a decrease in the biomass concentration in the reactor. After five days, however, the system began to recover. On day 278, the cyanide concentration was increased to 20 mg/L and a similar response was observed. The disruption in the system performance persisted for 28 days, with an abrupt recovery after that period. The system was then operated for approximately 180 additional days at the 20 mg/L cyanide feeding level. At the end of this period, the removal of glucose and cyanide and the nitrification process performance were similar to those observed during the operation at the 10 mg/L cyanide feeding level.

Cyanide Removal by Domestic Wastewater Activated Sludge Systems Cyanide removal reported for full scale, activated sludge, domestic wastewater treatment plants are in the range of 29 percent to greater than 91.7 percent at influent concentrations from 0.1 mg/L to 1 mg/L, and from 71 percent to 98.8 percent at influent concentrations from 1 mg/L to 10 mg/L. Effluent cyanide concentrations ranged from less than 0.01 mg/L at 0.37 mg/L at influent concentrations from 0.1 mg/L to 1 mg/L, and from 0.11 mg/L to 0.38 mg/L at influent concentrations from 1 mg/L to 10 mg/L.

Median removal efficiencies for cyanides reported in a study of 40 POTWs are 27 percent for primary treatment, 69 percent for activated sludge, and 66 percent for tertiary treatment. These removal efficiencies are not a substitute for site-specific removal efficiencies obtained through in-plant monitoring programs, but provide guidance in estimating the effects of treatment on cyanide levels through a POTW.

Cyanide removal mechanisms during biological wastewater treatment may include stripping of HCN, biodegradation of the free cyanide, hydrolysis to HCO2NH4, polymerization to a dimer (HCNHCONH2, reactions with the substrate, and adsorption onto the biomass. At the typical temperatures and cyanide concentrations of most wastewaters, the removal of cyanide by hydrolysis or polymerization is unlikely. For wastewaters containing aldoses (e.g., glucose) at a pH of 8, cyanides could react with the aldoses generating cyanohydrins and aldonic acids, which are biodegradable even by non-acclimated biomass and are less toxic than cyanide. In aerated, cyanide acclimated biological systems at neutral pH, the cyanide removal appears to be in the following ways (in order of importance): (1) stripping, (2) biodegradation, (3) adsorption onto biological floc, and (4) chemical reaction with substrate. At higher pH, chemical reactions with substrate become significant and adsorption on the biological floc will be of lesser importance.

Conclusions The cyanide inhibition threshold level reported in the technical guidance for developing pretreatment limits for activated sludge is in the range of 0.1 mg/L to 5 mg/L. The guidance does not distinguish between total or dissolved cyanide, or free or complexed, or what form of cyanide caused the observed inhibition. It is unlikely that cyanide is in a free dissolved state in most industrial wastewaters or in the combined wastewater at a POTW; it is likely either complexed or partially precipitated. Furthermore, the inhibition levels cited are the concentrations present in the aeration basin. Thus, for a complete mix system, individuals involved with pretreatment limit development must consider removal in the biological process, as well as in upstream processes.

These considerations can result in confusion with respect to application of the regulatory guidance. Site specific conditions such as a lower pH, a change in the level of complexation or a change in the buffer system chemistry contribute to observed inhibition levels reflected in the guidance. Thus, caution is important when considering the cyanide inhibition threshold level of 0.1 mg/L as a pretreatment limit. There are significant data demonstrating that the lower inhibition threshold concentration of 0.1 mg/L may be overly protective and that the site specific factors should be considered.

KEVIN D. TORRENS, BCEEM Mr. Torrens has over 27 years of experience in the environmental consulting field. He leads the industrial wastewater practice for Brown and Caldwell in the Northeast as well as leachate management and O&M services. His primary focus has been on design and operation of industrial wastewater and leachate treatment systems.
FOG and Pretreatment Go Together Like Peanut Butter and Jelly (I think?)

By: Tyrone Battle, City of Durham

In an effort to reduce the number, volume and re-occurrences of sanitary sewer overflows (SSOs), many of the Collections System Permits in North Carolina include language similar to, “The Permittee shall develop and implement an educational fats, oils and grease program targeted at both residential and non-residential users. The Permittee shall also develop and implement an enforceable fats, oils and grease program for non-residential users under which the Permittee can take enforcement against users who have not properly installed, operated and maintained grease traps or grease interceptors as directed or otherwise violated the terms of the local ordinance pertaining to fats, oils and grease.” This singular statement in its slightly varied forms triggered the birth of FOG Programs for POTWs throughout the State. The program description sets forth requirements that mandate outreach to the industrial, commercial and residential users as it relates to sewer usage and Sewer Use Ordinance enforcement as it relates to FOG. For many who work in the wastewater field, this probably sounds like a general description of the activities of the Pretreatment staff. Following this logic for many of those who have POTW oversight, it was a match made in heaven. However, as a new program was dropped in their proverbial laps, many Pretreatment professionals found themselves with the following series of thoughts:

- What?
- Why me?
- Why now? I am working on an Industrial Waste Survey and a Headworks Analysis after that!
- How can I run another program?
- Why Me?

- Goodness gracious! How do I reach every resident in our service basin?
- Goodness gracious! How do I reach every restaurant in our service basin?
- Wait a minute…don’t some hotels serve food? And schools? And retirement communities?
- Do we have enough staff?
- Why ME?

However, as many pretreatment professionals entered the second minute of the post new program bombshell, calm soon replaced the ebbing feelings of despair. It is fortunate that in North Carolina, the municipal/utility pretreatment professionals and the North Carolina Pretreatment Consortium (NCPC) are a fairly tight knit group providing wonderful array of resources. From conversations, presentations and interactions, this group gave birth to a number of ideas and strategies to implement appropriate measures to meet the goals and requirements of collection system permits.

The City of Durham’s FOG program is divided into commercial and residential components. To fully address both components, the City created two FOG technician positions currently held by Gregory Belcher and Adam Turner to expand both the inspection and outreach capabilities of the FOG program. Since November 2009, the FOG technicians have inspected over 250 different food service establishments (FSE) and performed over 600 inspections. The FOG technicians have met with the FSEs and offered educational sessions to each of the owners or managers explaining the problems associated with improper disposal of FOG and the requirements set forth by the City. The technicians have also been consistent in their re-inspection of locations to ensure compliance. The vast majority of FSEs has been cooperative and wishes to comply with our requirements.

The commercial portion of the program has a more consistent approach. However, working with the residential sector requires a vastly different approach and varies between reactionary and preventative measures. For the City of Durham, the residential sector has been the major contributor on the vast majority of Sanitary Sewer Overflows (SSOs). Based on that information, we have targeted our outreach efforts in that direction. Since December 2007, more than 18,000 residential customers have been contacted directly in response to SSOs that have occurred in their neighborhoods. This figure is in addition to FOG information periodically included in the water bills of all City users. The customers received written, bilingual communication that included a post card or a letter warning them of the consequences of fats, oil and grease in the collection system and providing proper disposal options. In some instances where apartment complexes have been determined to be contributors, onsite educational meetings were held and giveaway items with anti-FOG messages were distributed to each of the residents.
Fat Trapper and its contents

Industrial Pretreatment employees also staff educational displays at various events such as Community Days, Earth Day and Center Fest. In an effort to expand outreach and provide an alternative for “down the drain” disposal, the City purchased Fat Trappers for distribution. Since 2008, more than 2,800 of the popular trapper have been distributed at events such as National Night Out, the Latino Festival, City of Durham New Employee Training, churches, El Centro Hispano. Interested and concerned City employees in the Police, Solid Waste and Public Works Departments as well as the Durham Housing Authority have also distributed the containers. The Fat Trapper is a plastic receptacle roughly the size of a football that holds disposable foil lined bags. When a resident is finished cooking, the grease can be poured into the foil bag, the lid replaced and the remnants safely stored in a nonodorous, aesthetically pleasing container. When the bag is filled, it can be closed and disposed of with household solid waste reducing the entry of FOG into our collection system.

In addition to these ongoing efforts, a television commercial was produced and air time purchased with Time Warner Cable. The commercial aired on ABC Family, the Food Network, FX, Oxygen, the Lifetime Movie Network and Comedy Central for multiple runs since April 2009. We chose these six stations in an effort to reach a diverse segment of our customer base. The viewing area reached beyond Durham and included Orange, Granville, Vance, Warren and Franklin Counties as well as the northern half of Chatham. Thus far, the commercials aired over 700 times and reached over 667,000 people in the Durham zone.

The local family of sports talk radio stations (99.9 The Fan, 820 The Buzz and 1550 EPSN Deportes) produced and aired two version of an FOG. One version is aired during the summer, Thanksgiving and Christmas holiday seasons to target those who enjoy deep-frying. A second version with a more generic message airs during the remainder of the year. The commercials have aired over 600 times and reached nearly 225,000 people based on Arbitron figures. Both the television and radio ads included information as to how our citizens can recycle their used cooking oil at the City of Durham’s Club Boulevard Waste Disposal Facility.

Ultimately, we believe our efforts have been successful as indicated in the decrease in the number and volume of SSOs. But a favorite indicator is when an excited citizen of our City calls or approaches and asks, “Are you the grease guys? Do you have one of those grease containers I can have?” we think we may winning the war. These words are music to my ears!

TYRONE BATTLE
is the Industrial Pretreatment Program Coordinator for the City of Durham. In the capacity he is responsible for all aspects of the Pretreatment, FOG and Septage Programs. He has been in wastewater and pretreatment for 15 years.

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The typical role of an Industrial Pretreatment Program is to protect the wastewater collection system, prevent pass through and interference and protect the wastewater collection system workers. This work is regulatory in nature and has the potential to result in conflict with those regulated.

As stated in 40 CFR 403.2 the Pretreatment Program has three objectives:
(a) To prevent the introduction of pollutants into POTWs which will interfere with the operation of a POTW, including interference with its use or disposal of municipal sludge;
(b) To prevent the introduction of pollutants into POTWs which will pass through the treatment works or otherwise be incompatible with such works; and
(b) To improve opportunities to recycle and reclaim municipal and industrial wastewaters and sludges.

In North Carolina, a Pretreatment Program serves as a regulatory arm of local municipalities/utilities as required by their NPDES permits. Such a program regulates discharges of industrial waste into the sanitary sewer system from customers and users who qualify as Significant Industrial Users (SIUs). An SIU is any user who meets the following criteria:
All Industrial Users subject to Categorical Pretreatment Standards under 40 CFR 403.6 and 40 CFR chapter I, subchapter N; and
(ii) Any other industrial user that:

- discharges an average of 25,000 gallons per day or more of process wastewater to the POTW (excluding sanitary, noncontact cooling and boiler blowdown wastewater); contributes a process wastestream which makes up 5 percent or more of the average dry weather hydraulic or organic capacity of the POTW treatment plant; or is designated as such by the Control Authority as defined in 40 CFR 403.12(a) on the basis that the industrial user has a reasonable potential for adversely affecting the POTW's operation or for violating any Pretreatment Standard or requirement (in accordance with 40 CFR 403.8(f) (6)).

Most municipalities are in the unique position of regulating and potentially taking enforcement against the SIUs in their town while also selling them a product, clean water, and a service, wastewater treatment. These SIUs provide jobs and a source of revenue for the municipality and this unique relationship can present challenges for all parties involved.

The Federal and State Pretreatment Regulations require that municipalities regulate SIUs by issuing Industrial User Permits, judging SIU’s compliance with their permits and publish the names of those SIUs in Significant Non-Compliance with their permits. For many reasons, it is easy for a Pretreatment Program to focus on what’s wrong at SIUs.

In 1997, the Charlotte-Mecklenburg Utility Department (CMUD) came to the conclusion that it would be helpful to begin a program to recognize those industries who are doing things right. This program became known as the Environmental Excellence Awards. A set of criteria was developed that included requirements for permit compliance, environmental awareness and a cooperative spirit.

The first year of the awards, 17 SIUs met the criteria and were recognized. The awards for 1997 were presented at an awards luncheon in the fall of 1998. During the event, the Director of CMUD and the Division Manager presented plaques with the SIU’s name and the reason for the award. The names of the award winning SIUs were also published in the Charlotte Observer.

The awards program became a big hit with the SIUs. They were very appreciative of being recognized and this went a long way in building a strong working relationship between the SIUs and the Pretreatment Program. Many of the industries display the award in their main entrance and have special recognition of their employees for contributing to their efforts at compliance. The SIUs look forward to winning the award every year and focus their attention meeting permit requirements and carefully monitoring their discharges. All of our SIUs have heard of the program and want to win the award.

As the awards program has matured, we have continued to expand it. Many companies were achieving the baseline levels of compliance established in 1997 and we wanted to recognize those companies who won year after year or who achieved an even higher level of compliance. For this reason we later introduced two different levels of awards known as the Silver Award and the Gold Award. The criteria for each award are as follows:

**Silver Award**
1. 90% compliance for reporting, and monitoring
2. 90% compliance with permit limits for 1 calendar year
3. No slug loading
4. No SNC for 2 calendar years
5. Cooperative Spirit

**Gold Award**
1. 100% compliance for reporting, monitoring
2. 100% compliance with permit limits for 1 calendar year
3. No slug loading
4. No SNC for 2 calendar years
5. Cooperative Spirit
Introducing different levels of awards gave special distinction to those industries that have gone above and beyond complying with their permits. While the SIUs are happy to win a Silver Award, the fact that the Gold Award exists gives them something to strive for. The Gold Award is what most of the SIUs strive for and it is not uncommon for them to call to check up on how they are doing or to inquire during inspections about the awards.

To keep the program fresh and successful, we continue to look for new ways to recognize special achievements. The Crown Awards of Environmental Excellence were introduced in recognition of accomplishments above and beyond normal compliance. These awards are presented in three areas, Pretreatment, Pollution Prevention, and Water Conservation. The criteria for the Crown Awards are as follows:

**The Crown Award of Environmental Excellence – Industrial Pretreatment**
1. 100% compliance for reporting, monitoring
2. 100% compliance with permit limits for 1 calendar year
3. No slug loading
4. No SNC for 2 calendar years
5. Cooperative Spirit
6. Significant innovative technology or process improvement
7. Strive toward Environmental Excellence
8. Demonstrate strong environmental awareness and knowledge

**The Crown Award of Environmental Excellence – Pollution Prevention**
1. 90% compliance for reporting, and monitoring
2. 90% compliance with permit limits for 1 calendar year
3. No slug loading
4. No SNC for 2 calendar years
5. Cooperative Spirit
6. Integration of an industrial source reduction program
7. Maintaining high levels of environmental performance standards

**The Crown Award of Environmental Excellence – Water Conservation**
1. 90% compliance for reporting, and monitoring
2. 90% compliance with permit limits for 1 calendar year
3. No slug loading
4. No SNC for 2 calendar years
5. Cooperative Spirit
6. Demonstrate either a significant reduction in water use and/or a unique approach to achieving water use reduction and/or water reuse

As SIUs continue to have higher compliance rates and reduce their environmental impact, these types of significant gains become harder to achieve. Consequently, the Crown Awards are not presented every year.

The awards ceremony has grown to be about the awards.

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**BILG GINTERT** Environmental Compliance Manager, System Protection, Environmental Management Division, Charlotte-Mecklenburg Utilities, Bill has worked in Industrial Pretreatment for 14 years.
Did you know that concentrations of just 50-100 parts per million of oil can be detrimental to a sewage treatment process? A large part of North Carolina’s rich industrial population involves steel milling or cutting processes. These particular processes almost always use some form of cutting or quench oil, which, if released to a Publicly Owned Treatment Works (POTW) in untreated wastewater, could damage downstream equipment. These oils can become highly emulsified, making them particularly hard to treat. When this happens, industries turn to specialized water plants like FCC Environmental in Concord, NC. Plants like FCC Environmental are specially designed to treat these types of highly emulsified oily water streams.

Once an industry has determined that they have a waste stream that cannot be treated by a municipal wastewater treatment plant, they must then put a plan into action in accordance with their municipalities’ pretreatment program.

This program prevents the introduction of pollutants into the wastewater treatment plant that may interfere with the operation of the facility. In addition, the program also improves the opportunity to recycle and reclaim reusable resources (such as oil) from municipal wastewater and sludge.

The process of taking an industrial wastewater and turning it into a reusable product starts once a specialized tanker truck has picked up the material from the industrial facility. Once the truck reaches the pre-treater, the material is sampled using a composite liquid waste sampler (coliwasa) to get a complete core sample of the material. The sample is then taken to a QA/QC laboratory in order to check for conformance with a customer’s waste profile and compatibility with plant chemistry. A variety of tests are performed on the material, including COD, pH, percent of particulate matter, PCB’s, halogen content and any other test deemed necessary for a particular waste stream. If the sample passes all tests, it is then unloaded into a storage tank to await treatment. From there the material is placed in a processing tank to begin the process of separating the oil from the water. Oil is extracted from the wastewater during various stages throughout the treatment process. The oil is then handled according to 40 CFR Part 279 and in accordance with the NC Recycled Oil Management Plan. Once all available oil has been removed, the water is brought into the wastewater treatment plant; there, the water is treated through a physical chemistry treatment process. This physical treatment process prepares the water for discharge to the local Publicly Owned Treatment Works (POTW). Impurities and solids, extracted during the treatment process, are collected in a filter press and then hauled off to an approved local landfill. As a result, the oil that has been collected is placed in oil storage tanks, and sampled again to ensure it is in compliance, and then processed accordingly. Once processed, the oil is used as a fuel to permitted burners or sent to other locations for further processing.

Industries that produce oily waste waters should find a North Carolina Department of Environment and Natural Resources (NCDENR) approved Recycled Oil Processing Facility, like FCC Environmental. This ensures that wastewaters are being treated properly and usable materials are being recycled. It also provides environmental compliance and peace of mind to producers of these types of wastewaters.
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Making the final 7-hour push, climbing through the dark of night, and withstanding sub-zero temperatures, we are pleased to report that our Climb for Water team successfully reached the 19,340 foot summit of Mount Kilimanjaro in Africa at approximately 9:00 am Tanzanian time on Friday, September 2, 2011.

As most of you know, for 10 months the team raised awareness and financial assistance for the water and sanitation crisis facing the developing world. They launched the Climb for Water campaign on behalf of NC AWWA-WEA back in November 2010, and all proceeds collected are benefiting Water For People.

Their ascent of the highest freestanding mountain in the world was designed to serve as a unique way to bring meaning to the cause. According to team founder, Kraig Kern of WK Dickson & Co., Inc, despite the intense physical training over 18 months, it was an extraordinary struggle to reach the top that was seriously underestimated. Many times throughout the night thoughts of turning back entered their minds. Over the course of six days they learned, among other things, that altitude does strange things to people. Symptoms the entire team experienced included migraine headaches, loss of appetite, extreme nausea, sleeplessness, spontaneous nose bleeds, slurred speech, and loss of mental and physical awareness, and because of the lack of oxygen, every step required 4 or 5 deep breaths as they slowly approached their final destination.

As of this writing the Climb for Water campaign has raised close to $16,000 in cash contributions and in-kind donations of gear and other items. That amount alone can provide clean water to nearly 1,000 people for the rest of their lives. The positive impact on the generations who follow is incalculable. Two days prior to the climb they also had the good fortune to distribute 80 pairs of donated shoes they collected from the organization Soles4Souls to an orphanage in the small village of Moshi.

Congratulations to the team on a job well done!

So what does the team plan to do now? The Kilimanjaro adventure was intended to be a one-time event, but the decision has been made that climbing to help save lives was just too much of a good thing, so they are going to climb again - but this time a little closer to home. Climb For Water 2012 will take place during the summer in the beautiful state of Colorado where the team will ascend Pikes Peak. At 14,115 feet, it’s a potent challenge for the body and soul. The best part is that everyone is invited to join them! Don’t miss your chance to climb with not only the original Climb For Water team, but also members of the Water For People staff. Many more details will be available in the coming months.
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Recognition of Donors to the NC Safewater Endowment Program as November 9, 2011

The Endowment Committee and a group of 30 volunteers completed a fund raising initiative during the months of June 2011 through October 2011. We are very pleased to report that we received over $121,000 in pledges and donations during this fund raising initiative. This increased the total pledges and donations to the NC Safewater Endowment Program to over $241,000.

Currently the NC Safewater Endowment Program includes seven ‘Named Funds’ that have been approved by the NC AWWA-WEA Board of Trustees and a commitment from Rivers and Associates to establish an eighth ‘Named Fund.’ A donor may establish a ‘Named Fund’ by donating/pledging $25,000 or greater to the NC Safewater Endowment Program. Four corporate donors: Raftelis Financial Consultants, Inc., GHD Consultants, Crowder Construction Company, and Rivers and Associates, Inc. committed to pledges/donations at this level during the fund raising initiative.

The Endowment Committee commends the corporate donors listed below for giving/pledging at the level shown:

| SWIFT STREAMS CORPORATE DONORS ($5,000 TO $9,999) |
| HDR Engineering |

| ROARING RIVERS CORPORATE DONORS ($10,000 TO $14,999) |
| Highfill Infrastructure Engineering, P. C. |

| GREAT LAKES ($15,000 TO $24,999) |
| no corporate donors at this level at this time |

| MIGHTY OCEANS CORPORATE DONORS ($25,000 AND GREATER) |
| Crowder Construction Company |
| GHD Consulting, Inc. |
| Raftelis Financial Consultants |
| George and Eva Raftelis Foundation |
We also want to recognize the other corporate and individual donors listed below:

**CORPORATE:**
- Black & Veatch
- CMU (in honor of Doug Bean)
- Dixon, Hughes, Goodman, LLP
- Hazen and Sawyer, PC
- Novozymes North America
- Pete Duty & Associates
- S&ME, Inc.
- Withers & Ravenel, Inc.

**INDIVIDUALS:**
- Amy Cullipher
- Angela Lee
- Barry Gullett
- Bob McElfresh
- Brent Reuss
- Brian Tripp
- Buck Kennedy
- Catrice Jones
- Chris & Mattie Shamel
- Chris Belk
- Chris Thompson
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- Steve Shoaf
- T. J. Lynch
- Terry Houk
- Thomas Lipinski
- Tim Broome
- Trevor Clements
- Vicki Westbrook
- Wayne Miles

We are very thankful to all of the donors who have supported the NC Safewater Endowment Program to date. We encourage ALL members of NC AWWA-WEA to become a Founding Donor by making a donation to one of the funds in the NC Safewater Endowment Program by September 30, 2012.

Les Hall, Chair Endowment Committee  

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**SWAN ANALYTICAL USA, INC.**
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The children’s eyes were riveted to the superhero. Was the talk about crime? Was that a sample of kryptonite? No. The gripping story was the water cycle. And that was the model of a water molecule being passed from hand to hand.

“When I think of spandex in red and blue, I don’t think of Wonder Woman,” laughs Linda Vaughn. “I think of Carol.”

During her time as the City of Raleigh’s Environmental Coordinator, Carol Bond would dress up as Wanda Water and go to area schools to talk about the importance of water and water conservation. Among the first in the state to become a Certified Environmental Educator, the tireless dynamo was involved in everything from conducting tours of facilities for children and teachers to playing a key role in creating WaterFest, an annual event during Raleigh’s Drinking Water Week celebrations. Right up to her untimely death on April 10, 1999, Bond was passionately dedicated to environmental education.

“She was a delightful person with a wonderful sense of humor,” recalls Vaughn. “She was funny, creative and bubbled with energy.”

Vaughn was working for Orange County Water and Sewer when she first met Bond and Vicki Westbrook, the City of Durham’s Assistant Director of Water Management. “The three of us conducted workshops to promote conservation and a better understanding of a water system,” she recalls. “The goal was to teach conservation and challenge folks to do community outreach.”

They made a good team. Vaughn had experience in customer service; Westbrook knew the biology; and Bond had a handle on the chemistry from her years of teaching middle school science in the public school system.

The three women also served on the Public Education Committee (PEC) of the NC AWWA-WEA. “At that time, we were looking for ways to engage youth in thinking about water resources, water and wastewater treatment and water conservation,” recalls Westbrook. “We also wanted to re-energize the public education process by coming up with some ways to reach out to teachers.”

It was around that time that the national Water Environment Federation (WEF) rolled out its first Water Source Book that contained lesson plans on all aspect of wastewater, water and conservation. The PEC convinced the association to purchase the books and give workshops across the state.

Their next challenge was to partner with the NC Science Teachers Association and Environmental Educators of NC at their annual conferences. “Carol had just the right qualities to work with that group,” says Westbrook. “She was one of them. She spoke their language. She knew how they needed to make it fit into their curriculum.” As a former teacher, Bond was sensitive to the fact that teachers have limited resources, so she highlighted practical projects such as making a treatment filter from a two liter bottle and different types of gravel. The plastic bottle filter illustrated the concept at very little cost.

This was not Bond’s first foray into teacher education. Before there was a national water curriculum or water workshop, Bond partnered with Sheila Jones, an environmental educator with Wake Soil and Water Conservation District, to write their own water lessons. Together they conducted “Project W.E.T. (Water Education for Teachers) workshops that covered the water molecule, water’s three states of matter, the water cycle, household hazardous waste, and water treatment, including a tour of Raleigh’s drinking and wastewater treatment plants. Soon after, the national Project WET curriculum was published, so Bond and Jones renamed their workshop “WATER WORKShop.”

For the WATER WORKShops, Carol decided to show teachers how they could teach about water using a new classroom tool called a “computer.” She did this by borrowing the city’s Mac computers from various locations and hauling them to the workshop site. In those days, the computers and their monitors were very heavy and cumbersome! But Carol always went the extra mile for the teachers – one of her favorite and most appreciative audiences.
Bond was the type of person who always found a way to work around obstacles to make sure something could be done. For instance, she was instrumental in helping the state association keep the Water Poster Contest going even after national AWWA wound down the contest in the mid-1990s. Recalls Westbrook: “Carol always played an integral role in bringing people from water, wastewater and conservation on board to help with getting posters submitted, even from outlying areas. I think she inspired a number of other people to pursue this kind of outreach.”

She adds that one of Bond’s biggest legacies was her part in launching the City of Raleigh WaterFest, held annually at one of the City’s treatment plants. Geared toward children from kindergarten to grade eight, the festival included tours of the facility, laboratory experiments, games and many more hands-on activities geared at promoting the importance of preserving, protecting and conserving drinking water. Two of the children’s favorites included watching demonstrations of “pigging the lines” and earning a ride on the “topless bus” that drove through water sprinklers, drenching its occupants. The event was sponsored by the City’s Public Utilities Department and supported by several engineering companies.

Right from the beginning, Bond was a key team player in the development, implementation and eventual success of the festival. Westbrook remembers busloads of boy scouts spilling onto the grounds during the three-day event. And, of course, Wanda Water would be on hand, giving tours and leading activities. “She took that and ran with it and made it huge,” says Westbrook, noting that, that the City of Raleigh’s Environmental/EMS Coordinator Marti Gibson continued chairing the festival committee after Bond’s death.

A few months before she was diagnosed with pancreatic cancer, Bond spearheaded an NC AWWA-WEA Public Education Committee initiative to recognize members of the association for their outstanding achievements in public education, in water, wastewater or related areas of the industry. To be nominated for the award, individuals had to fulfill any of the five criteria outlined by the committee. These included advancing knowledge among the general public or targeted groups; demonstrating a commitment to education by initiating a major project or program; having a significant, measurable impact on the community; working in one or more areas of public education (youth, water conservation, wastewater, biosolids, etc.); and, being involved for more than five years.

Bond met all the criteria.

Then, a year later, on November 16, 1999, the award was presented posthumously to Carol Bond. In recognition of the legacy that she has left behind, the committee decided to rename the award the Carol E. Bond Big Splash in Public Education Award.

Besides being a dedicated educator, Carol Bond was a devoted single mother of four girls, one of whom was still in high school when Bond died in her early 50s. To support her family, she would often drive an airport shuttle in the evenings after her regular job. Following her cancer diagnosis, several of her work colleagues took time to make repairs to the family home and, after her death, they checked in on her girls.

To honor Bond, her co-workers at the City of Raleigh generously donated the seed money for a scholarship administered by the NC AWWA-WEA Public Education Committee. Every year, the association awards The Carol Bond Memorial Scholarship to assist university/community college students and environmental educators in continuing their studies in the field of environmental science education.

Vaughn is very pleased that the committee fittingly named the scholarship after Bond. “She was a great ambassador for water conservation, the water industry and educating young people,” she says. “Carol just had this wonderful zest and appreciation for life. If you were around her, you couldn’t help but smile.”
The first climb of Mount Everest overcame a tough challenge.

Dedication to a challenging mission and the will to carry it out led to the first conquest of Mount Everest. On a much smaller yet still important scale, the world’s first submersible sewage pump driven by a premium-efficiency motor launched by ABS overcomes a tough challenge in wastewater handling.

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...or more importantly, the first choice if you want to be right!
A

s North Carolina’s Summer Ventures in Science and Mathematics (SVSM) celebrates its 26th year, the state-funded competitive program is proving to be more important than ever. “A serious problem with undergraduate STEM (Science, Technology, Engineering, and Mathematics) education is high student attrition,” writes Congressman Bart Gordon, chair of the House Committee on Science and Technology. “In most instances, attrition is not because of an inability to perform academically, but because of a loss of interest and enthusiasm…The supply part of the equation is motivating and preparing a sufficient number of students to pursue training in these fields…”

Summer Ventures addresses these issues head on. The programs brings together, from across the state, academically high achieving seniors and juniors who have demonstrated interest in STEM-related disciplines. For four weeks during July and August, these rising high school students engage in a period of intensive study in a residential university setting. Led by an experienced professor and a master teacher, each class takes the students in the laboratory and, many times, in the field to develop and their skills through a real-life research project of the student’s own choosing.

“Summer Ventures is set up to get students excited about the possibilities of math and science and take them beyond what they can do in their high school setting,” says Christopher Gordon, coordinator of the program at the University of North Carolina at Wilmington. Administered by the North Carolina School of Science and Mathematics, Summer Ventures has been held at six campuses across the University of North Carolina System.

This incredible opportunity is offered free of cost to students selected by a 15-member committee composed of education, science and mathematics professionals from across the state. “They are the cream of North Carolina’s high school science students,” says Dr. Michael Smith who sits on the committee and has also taught the Coastal Geology class for Summer Ventures at UNC Wilmington.

Students must submit a completed application along with transcripts and a list of extra-curricular activities and interests. In 2011, the program received almost 1500 applications from all 100 counties across the state. The top 300 were placed in a program, with an additional 200 placed on a waiting list as alternates. From the creation of SVSM by North Carolina General Assembly legislation in 1984 to the program’s 25th anniversary in 2009, more than 12,000 students have participated in the academic program.

For the anniversary, the SVSM State Coordinator’s Office prepared a report that summarized some of the successes of the program. Among several alumni, the report quotes Robert A. Leandro, a Health Care and Regulatory Attorney who participated in Summer Ventures in 1995: “I still count [the] summer at UNCW as one of the most important experiences of my life. Studying marine biology at SVSM opened up a new world of possibilities for me. For the first time in my academic career, I was able to do real science coursework, in an actual science lab, using sophisticated instrumentation. Summer Ventures also allowed me to learn from and work hand in hand with brilliant and committed professors whose passion for teaching about the complexity of the marine world was infectious. SVSM provided me with a new understanding of the vast possibilities that existed in the outside world. Without SVSM, this exposure would not have been possible.”

The academic offerings of SVSM include everything from archaeology and engineering to mathematical modeling and computer science. Each campus offers an experience that best suits its unique resources and geography. For instance, the seaside location of UNC Wilmington makes it an ideal location for courses in coastal biology, ecology and geology. In every class, the focus is on learning through doing, instilling 24 skills deemed critical to successfully achieving a career in science, technology, engineering and mathematics. The list encompasses statistical techniques, scientific literature review, mathematical modeling and critical review skills as well as posing research questions as an important step in the scientific method.
questions, designing experiments, writing abstracts and making oral reports. Regularly reviewed by program directors, this list was last revised in 2007 and aligned to national STEM education standards for the 21st century.

At the end of the program, students are required to formally present the results of their research to their instructors, peers and families as well as other UNCW faculty and staff. Three projects from each campus – two finalists and one alternate – are honoured with a Catalyst Award. Students with winning projects in mathematics and technology then present their projects at the North Carolina Science Teachers Association Meeting. Meanwhile, all students are encouraged to submit their research to science fairs and contests.

“Students come out of Summer Ventures with a different perspective on how to approach their college education,” says Melissa Thibault, SVSM coordinator at the state level. “When these students come into their undergraduate studies, they are ready to do research in a way that other students coming out of high school are not.”

More than 98 percent of SVSM students pursue post-secondary studies and 75 percent attend a UNC system school. “It is a great recruitment tool,” Dr. Smith points out. Studies have also shown that 65 percent of SVSM alumni graduate with a degree in a STEM field and 56 percent pursue a STEM-related career. More than half complete a graduate degree and a quarter indicate they are teaching or plan to teach.

“Another goal of the Summer Ventures program is to include people who have the potential to go to university but might never have the opportunity,” notes Dr. Smith.

Because there are no tuition fees (costs of transportation and the initial medical exam are also covered, when necessary), SVSM is open to students of all socio-economic backgrounds. “It was monumental that there was no cost associated with acceptance in the program, since a fee associated with the program would have likely prevented my participation,” notes one of the SVSM alumni quoted in the 2009 anniversary report. “SVSM allowed me valuable exposure to a college classroom and an opportunity to interact with other talented students in the area of math and science.”

Living– in residence hall – and learning together offers invaluable opportunities for peer-to-peer interaction to a group of students who share common interests. “They may not have another student in their high school with whom they can discuss biotechnology or the physics of wind tunnels,” notes Thibault. “Here they are with students just as excited about science as they are.”

Their enthusiasm benefits the instructors as well. “These students are very competitive,” says Gordon. “They want to learn and they drive the faculty pretty hard.” University faculty who teach SVSM courses can also practice new laboratory techniques with participants in preparation for implementing those activities with their university students.

“The program also provides professional development for North Carolina high school science teachers,” Dr. Smith points out. “It is something they can take back to their high school as well.” In fact, the benefits of SVSM reach far beyond the group that participates.

“These are students who don’t know what’s not possible,” notes Thibault. “That kind of mentality is important for innovation and scientific discovery.”

By nurturing their passion and aptitude for science, SVMS is helping to lay the groundwork for a future that is more promising for everyone. As the President stated in his 2011 State of the Union Address, “Maintaining our leadership in research and technology is crucial to America’s success. But if we want to win the future – if we want innovation to produce jobs in America and not overseas – then we also have to win the race to educate our kids.”

“Unfortunately, economic recession and state cut-backs to university funding have resulted in the withdrawal of two university campuses from the program over the past three years. Nonetheless, SVSM continues to accept application for placement in classes to be held on any of four UNC campuses. Deadline for applications is January 31, 2012. Find out more at www.summer-ventures.org or contact State Coordinator Melissa Thibault at 919-416-2877.”
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Web: www.wsgandsolutions.com
2012 Annual Conference Call for Papers

The NC AWWA-WEA Annual Conference Program Committee is soliciting presenters for the 92nd Annual Conference that will take place November 11-14, 2012 at the Raleigh Convention Center in Raleigh, NC. Technical Sessions will cover water, wastewater, collection & distribution, policy & management, and other industry-related special topics. Abstracts are due April 2, 2012. More information and submission form is available at www.ncsafewater.org. Selected presenters will receive further instructions on final presentation format at a later date. Full papers are required for this conference. At the conclusion of the Annual Conference all accepted papers will be posted on the Annual Conference page of www.ncsafewater.org. For questions please contact Larry Mitchell, 2012 Annual Conference Program Chair, at larry.mitchell@aecom.com or (919) 854-6235. Abstracts and forms received after April 2, 2012 will not be considered.

2011 Photo Contest

**Critters Around Us**
Winner: Water Fowl on Roanoke River in Plymouth, NC in Washington County – Photo by Steve Reid, NC DENR Division of Water Quality

Honorable Mention: Valuable Predator Dragonfly – Photo by Rhonda Hutson, Charlotte-Mecklenburg Utilities

**Environment**
Winner: Sunset Beach in Brunswick County – Photo by Steve Reid, NC DENR Division of Water Quality

Honorable Mention: Linville Falls Upper Overlook North of Morganton in Burke County – Photo by Steve Reid, NC DENR Division of Water Quality

**Structures**
Winner: Ready to Fill – Photo by Glenn Walker, Brunswick County Utilities

Honorable Mention: Muddy Creek Headworks 5 Screw Pump – Photo by Keith Jones, City of Winston-Salem
Schnabel Named to CE News’  
“Best Firm to Work For List”  
October 6, 2011 - Schnabel Engineering, Inc. (Schnabel), Glen Allen, Virginia, is pleased to announce that they have been ranked 9th on the “Best Civil Engineering Firms to Work For” list by CE News magazine. The criteria used to make the selection included culture, benefits, compensation, performance/recognition, recruiting and employee retention, and professional development, as well as an employee satisfaction survey. In addition to the above recognition, Schnabel placed 167th on the Zweig White Hot Firm List. The Zweig Letter 2011 Hot Firm List recognizes the fastest-growing engineering, architecture, planning and environmental consulting firms in the United States and Canada.

Schnabel’s CEO, Mr. Gordon M. Matheson, PhD, PE, PG, stated, “The employees and management team at Schnabel are proud of these accomplishments. We are committed to serving our clients by creating an inviting workplace to attract and retain quality employees.”

Schnabel, an employee-owned company, is an ENR Top 10 geotechnical engineering firm, employing more than 300 in offices from coast to coast. Schnabel’s specialized services include geotechnical and geosstructural engineering, as well as dam and tunnel engineering, environmental services, geophysical and geosciences services, construction monitoring, and resident engineering. These coordinated GeoDesign efforts provide integrated service to every project from subsurface explorations and soil testing, through engineering analysis, design, and construction support. For more information, please visit us at schnabel-eng.com.

Thank you to everyone who participated in our 2011 Photo Contest. These photos along with others submitted will appear throughout the year in NC AWWA-WEA publications, on www.ncsafeewater.org and in other NC AWWA-WEA advertising. Details on the 2012 Photo Contest will be available online in January.

Water Supply
Winner: Nello Teer Rock Quarry. This quarry is no longer being mined and has been considered for the City of Durham’s water supply. – Photo by Wayne Walker, City of Durham Water Management

Honorable Mention: Roanoke River in Plymouth, NC in Washington County – Photo by Steve Reid, NC DENR Division of Water Quality

Miscellaneous
Winner: MSD Buncombe County’s Manhole Rock – Photo by Eric Sams, MSD Buncombe County

Honorable Mention: MSD Buncombe County BBQ Made with Manhole Covers – Photo by John Kiviniemi, MSD Buncombe County

Thank you to everyone who participated in our 2011 Photo Contest. These photos along with others submitted will appear throughout the year in NC AWWA-WEA publications, on www.ncsafeewater.org and in other NC AWWA-WEA advertising. Details on the 2012 Photo Contest will be available online in January.
NC Currents Future Themes

NC Currents is the official publication of the NC AWWA-WEA. Members, individuals and committees are encouraged to submit content for the magazine. If you would like to submit an article to be considered for publication in NC Currents please complete the Submission Form & Publication Agreement (available at www.ncsafewater.org) and email both the completed form and your article to Nicole Banks at nbanks@ncsafewater.org. Articles must be received by 5:00pm EST on the listed submission deadline.

The editors of NC Currents welcome the submission of all articles related to the water and wastewater industry. Themes serve as general guidance for each issue, but articles are not limited to issues specific theme. Submission of an article does not guarantee publication. The editorial committee will review and select all articles, and authors will be notified of the status of their submission.

**SPRING 2012**  **Theme: Water Sector Security** *(Submission Deadline January 17, 2012)*

As threats to the Water Sector change and evolve so must our preparations and responses. The low hanging fruit may have already been picked but our work is not complete. Protecting the investments made in infrastructure, consumer confidence and our natural environmental resources from manmade threats and natural disasters continues to be the heart of emergency preparedness and security based risk reduction programs. The next generation of security upgrades will take a more concerted effort. Is there support from EPA and the state? Losing interest in security and emergency preparedness is not an option. Integrating security into all facets of our planning (engineering, design, construction) and our daily work routine will develop the culture shift necessary to achieve security of our water resources and inspire consumer confidence in our abilities. The Communication Committee is requesting articles on any aspect of emergency preparedness and security.

**SUMMER 2012**  **Theme: The Water and Wastewater Industry Goes ‘Green’** *(Submission Deadline April 10, 2012)*

As concern for climate change grows in the scientific world and in the political world, and more emphasis is being placed on moving away from fossil fuels, we find many public utilities looking for ways that they can reduce their carbon footprint, as well as save on energy cost. Methods being pursued range from installing solar panels at water and wastewater plants, retrofitting water supply dams with turbine generators and looking at ways to make pumps and motors more energy efficient. This issue will feature articles describing what North Carolina Utilities are doing to move toward greener technologies, processes and operating approaches.
Residuals and Biosolids 2012
Advancing Residuals Management: Technologies and Applications
Conference: March 25 – 28 | Exhibition: March 26 – 27
Sheraton Raleigh | Raleigh, North Carolina

Attention North Carolina water quality professionals! The Water Environment Federation, in cooperation with the North Carolina Water Environment Association, is pleased to announce Residuals and Biosolids 2012 — Advancing Residuals Management: Technologies and Applications.

Technical Sessions Focused On:
• Bioenergy from Residuals
• Conditioning and Dewatering Technologies
• Legislative, Regulatory and Legal Issues
• Facilities Operation, Management and Planning
• Odor and Pathogen Control
• Climate Change/Greenhouse Gas Issues
• Thermal Processes

Tour Highlighting
• Town of Cary’s Water Reclamation Facility and the Neuse River WWTP (highlighting 2-stage aerobic digestion, thickening, dewatering, hopper storage, and pasteurization with lime kiln dust.)

Residuals and Biosolids 2012 Charity Golf Tournament
Saturday, March 24, 2012
9:00am – 3:00pm
Join your colleagues at this year’s new charity golf tournament! The event will take place at Lonnie Poole Golf Course at North Carolina State University. Ticket price includes tournament round, lunch and Water for People donation. Pack your clubs and join the fun for a good cause!

Additional information, including the conference program, hotel, and on-line registration is available on the conference website.
www.wef.org/ResidualsBiosolids
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Laser Alignment
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The following schedule is current as of December 13, 2011. For updates or more information please contact the organization listed with each event. If no organization is listed it is an NC AWWA-WEA event, and details may be obtained by calling the NC AWWA-WEA office at (919) 784-9030 or visiting www.ncsafewater.org.

### January

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<tr>
<td>25</td>
<td>Board of Trustees Meeting</td>
<td>Charlotte, NC</td>
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<tr>
<td>26-27</td>
<td>SE Regional Technology Transfer Conference</td>
<td>Greenville, SC</td>
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<tr>
<td></td>
<td>SC AWWA (803) 358-0658</td>
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<tr>
<td>30</td>
<td>WEF and AWWA Utility Management Conference</td>
<td>Miami, FL</td>
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<tr>
<td></td>
<td>AWWA (800) 926-7337</td>
<td>WEF (703) 684-2400</td>
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### February

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<tr>
<th>Date</th>
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<tr>
<td></td>
<td>Legislative Water Seminar</td>
<td>Raleigh, NC</td>
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<tr>
<td></td>
<td>It's Good to be Green: Project Funding and Sustainability in a Down Economy</td>
<td>Raleigh, NC</td>
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<tr>
<td>21</td>
<td>NCWOA Seminar: Basics 2012</td>
<td>Fayetteville, NC</td>
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<tr>
<td></td>
<td>NCWOA (252) 764-2094</td>
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<tr>
<td>23</td>
<td>NCWTFOCB Certification Exam</td>
<td>Kinston, Morganton, and Raleigh NCWTFOCB (919) 733-0379</td>
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### March

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<th>Date</th>
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<tr>
<td>8</td>
<td>NCWOA Seminar: Distribution &amp; Collection</td>
<td>Hickory, NC</td>
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<tr>
<td></td>
<td>NCWOA (252) 764-2094</td>
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<tr>
<td>11-14</td>
<td>South Carolina Environmental Conference</td>
<td>Myrtle Beach, SC</td>
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<td></td>
<td>SC AWWA &amp; WEA SC (803) 358-0658</td>
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<tr>
<td>12-16</td>
<td>Eastern Collection &amp; Distribution School</td>
<td>Raleigh, NC</td>
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<tr>
<td>15</td>
<td>Board of Trustees Meeting</td>
<td>Raleigh, NC</td>
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<tr>
<td>25-28</td>
<td>WEF Residuals and Biosolids Conference</td>
<td>Raleigh, NC</td>
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<td></td>
<td>WEF (703) 684-2400</td>
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<tr>
<td>26-30</td>
<td>NCWOA Spring School</td>
<td>Morganton, NC</td>
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<td>NCWOA (252) 764-2094</td>
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### April

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<tr>
<td>15-17</td>
<td>11th Spring Conference</td>
<td>Wilmington, NC</td>
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<tr>
<td>22-27</td>
<td>NCPC Pretreatment Certification School</td>
<td>Clemmons, NC</td>
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<td>NC Pretreatment Consortium</td>
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<td>26</td>
<td>NCWOA Seminar: Small Systems</td>
<td>Sanford, NC</td>
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<td>NCWOA (252) 764-2094</td>
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### May

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<tr>
<td>1-4</td>
<td>Physical/Chemical Wastewater Operators School</td>
<td>Raleigh, NC</td>
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<tr>
<td>8</td>
<td>Lab Tech Day</td>
<td>Raleigh, NC</td>
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<tr>
<td></td>
<td>NCWOA (252) 764-2094</td>
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<tr>
<td>14-17</td>
<td>NC Rural Water Annual Conference</td>
<td>Greensboro, NC</td>
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<td></td>
<td>NCRWA (336) 731-6963</td>
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<tr>
<td>17</td>
<td>Board of Trustees Meeting</td>
<td>Greensboro, NC</td>
</tr>
<tr>
<td>31</td>
<td>NCWTFOCB Certification Exam</td>
<td>Kinston, Morganton, and Raleigh NCWTFOCB (919) 733-0379</td>
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### June

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<tr>
<td>14</td>
<td>WPCSOCC Certification Exam</td>
<td>Keansville, Morganton, Raleigh, Salisbury, and Williamston WPCSOCC (919) 733-0026</td>
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<tr>
<td>10-14</td>
<td>AWWA ACE Annual Conference</td>
<td>Dallas, TX</td>
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<td></td>
<td>AWWA (800) 926-7337</td>
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<tr>
<td>21</td>
<td>NCWOA Seminar</td>
<td>New Bern, NC</td>
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<td></td>
<td>NCWOA (252) 764-2094</td>
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## Schedule of Events

### July

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<th>Date</th>
<th>Event</th>
<th>Location</th>
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<tr>
<td>12</td>
<td>Board of Trustees Meeting</td>
<td>Winston-Salem, NC</td>
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<td>16-20</td>
<td>Western Biological Wastewater Operators School</td>
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<td>Western Collection &amp; Distribution School</td>
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<td>14</td>
<td>NCWOA Seminar: Small Systems</td>
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<td>NCWOA (252) 764-2094</td>
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<td>NCWOA Seminar: Drinking Water</td>
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<td>30</td>
<td>NCWTFOCB Certification Exam</td>
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<td>WPCSOCC Certification Exam</td>
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<td>Keansville, Morganton, Raleigh, Salisbury, and Williamson</td>
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<td>WPCSOCC (919) 733-0026</td>
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<td>Maintenance Technologist School &amp; Exam – Classes I, II &amp; III</td>
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<td>20</td>
<td>Board of Trustees Meeting</td>
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<td>24-29</td>
<td>NCWOA Fall School</td>
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<td>Coastal Collection &amp; Distribution School</td>
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<td>11-14</td>
<td>92nd Annual Conference</td>
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