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Message from the Chair

An Investment in Knowledge Pays the Best Interest

Mike Osborne, PE, Regional Manager, McKim & Creed, Inc.

No matter if you work for a utility, a consulting engineering firm, or an equipment/materials supplier, those of us in the water industry today share the same ultimate goal: to provide safe, clean, aesthetically pleasing water to our customers. That also includes treating wastewater in such a way that protects the environment and ensures that our water resources can be safely used by our downstream neighbors.

This is what our customers expect of us. But more and more, they also want to know what goes on behind the scenes. They want to know that their water utilities are managed efficiently and effectively. They want stellar customer service and sound fiscal policies. Finally, they want to know that the staff responsible for their clean water is highly trained and up to date on the latest treatment technologies. As water professionals, we are tasked with these responsibilities, and it is up to us to deliver. But with higher expectations and fewer resources, how do we manage? The answer, once again, is education.

The Association’s vision is to be the preferred choice for professional development and continuing education for the water industry of North Carolina. We seek to provide educational avenues and resources that enable our members to successfully respond to the increasing demands for constantly elevating levels of service. The way we are doing that is through conferences, workshops, seminars, schools, and other knowledge-sharing opportunities.

As I write this, we are just days away from our Spring Conference, which offers more than 50 technical programs in the areas of water and wastewater facilities and collection and distribution infrastructure. Attendees have an opportunity to earn six continuing education units (CEUs) each day. In addition, dozens of vendors will be on hand to showcase the latest technologies and expertise our industry has to offer.

The Membership, Communications, and Young Professionals committees have teamed up to offer an exciting new avenue for information and knowledge exchange called GROW, which began in Charlotte on April 24. GROW provides an opportunity for local members to get together, socialize, and share information in an informal setting. GROW is not limited to young professionals or to Charlotte. The committees plan to offer these events in other venues around the state. Be on the lookout for ads and additional information.

NC Currents is a stellar example of our Association’s knowledge-sharing tools. In this issue, water industry professionals share their utility management best practices. Access to this type of information helps all of us grow and improve in our professions.

Another outstanding educational opportunity is U-Pick Training. You pick the topic, you provide the location and our trainers will come to you! The Seminars & Workshops Committee will create a customized, six-credit-hour seminar, and the Association will coordinate lunch and registration.

Then there are career ladders. The Career Ladder Task Force is hard at work on this project, which we hope to have in place and available for enrollment by November. The career ladder will provide a template of tools and resources that can, for example, help prepare an entry-level operator for a future as a supervisor or utility manager. The program goes beyond technical skills to focus on the people skills that are so important in our industry, such as public speaking, addressing the media and customer service. These are the skills that are needed for the depth and breadth of utility operations. The career ladder provides yet another education opportunity for those who have the motivation and desire to advance in their careers.

Benjamin Franklin once said, “If a man empties his purse into his head, no one can take it away from him. An investment in knowledge always pays the best interest.” I couldn’t agree more. As an Association, we continually invest in the knowledge and education of our members, which ultimately translates to providing the outstanding service and delivering the high-quality water our customers deserve and expect.
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When addressing the concept of ‘best practices’ it seems, at first, a bit like the Lewis Carroll poem “The Walrus and the Carpenter” – a mélange of topics that do not seem to make sense … and yet, the quest to do-the-best-in-all-we-do is the ‘holy grail’ for every business and every non profit.

Wikipedia says that, “A best practice is a method or technique that has consistently shown results superior to those achieved with other means, and that is used as a benchmark.”

Since the dawn of time, humans have never hesitated to try doing better at everything they set their hands to, but really, where did the whole concept of ‘best practices’ as an official international standard of business originate?

That question sends me down another rabbit hole, on a search for information about ISO 9001 and 14001…

Wikipedia tells me that “A standard is … precise criteria designed to be used consistently as a rule, guideline, or definition…” and goes on to say that “All formal standards are developed with a period of public enquiry and full consultation… they incorporate the views and expertise of a very wide range of interests from consumers, academia, special interest groups, government, business and industry. As a result, standards represent a consensus on current best practice.”

I learned from the same source that standards are designed for voluntary use and do not impose regulations. However, laws and regulations may refer to standards and may make compliance with them compulsory.

Still more research down the same hole leads me to the British Standards Institution (or BSI Group), a multinational business services provider whose principal activity is producing standards and supplying standards-related service. Founded in 1901 and now operating in 150 countries, BSI is responsible for the International Organization for Standardization (ISO) designations.

BSI Group is the world’s largest certification body. It audits and provides certification to companies worldwide that implement management systems standards, including ISO 9001 (Quality) and ISO 14001 (Environment).

Many utilities these days are making a big investment in ISO 14001 which sets out the criteria for an environmental management system, mapping out a framework that can be used by any organization wanting to improve resource efficiency, reduce waste and reduce costs.

The quest for ‘best practices’ starts with a review of all elements of current operation and plans for the future (objectives, goals and measurable targets), and allocation of resources; development of policies; procedures; documentation; education;
emergency response preparation; communication. Then there is a shift from planning and research to ‘doing’ – the transition from the process of thought, intent and planning to the real-world day-to-day work of ‘thought made manifest.’

But why do it at all?

What leads utilities and thousands of other companies to invest the human and financial capital in getting ISO certification? It could be that major purchasers are seeking providers with certification. It could be that there are financial benefits for organizations that have ISO certification – one study by the British Assessment Bureau in 2011 showed 44% of its certified clients had won new business. It could be that undergoing the analysis and documentation leads to superior operational performance – another study showed this to be the case for the US automotive industry.

But which came first, the chicken or the egg? Did the better performing-companies seek out certification in the first place? And really, does it matter? What does this all mean for NC AWWA-WEA and its member companies, individuals and utilities?

My thought is that superior organizations do seek out benchmarks, standards, and certifications. They have the confidence to embrace change. They are unafraid of scrutiny, willing to invest time and effort in self-analysis because they believe there is a payoff in the form of better customer satisfaction, communication, work processes, relationships with suppliers, use of human and financial capital – and that an organization will reap dividends from all the effort invested. I think we are one of those superior organizations.

I believe the water industry has an exceptional history of self-improvement and development of voluntary ‘best practices.’ Both AWWA and WEF, and their Sections and Member Associations (MAs) have a century-long pattern of standardizing practice, sharing knowledge, enhancing skills, and exceptional collaboration. All our collective efforts are focused on solutions to problems and achieving the goal of ‘best practice.’ It is intrinsic to the work of water professionals to seek out vulnerabilities in our systems, our training, our practices, and find ways to resolve potential weakness. Preparedness is central to the work of water.

I also think it is sometimes possible for organizations that make the investment in developing and using best practices to defer or render needless, the imposition of mandatory legislated standards. By providing assurance to consumers that quality will be high, consistent and consistently maintained, those organizations build confidence and trust. I think we have done that in North Carolina, and that our parent entities have done that on a national level.

That effort continues. NC AWWA-WEA has worked extremely hard and is very proud of its efforts to develop best practices in its strategic planning approach; financial management process; collaborative outreach to sister organizations; supportive services for volunteers who lead and teach; and delivery of excellence in training to sustain continuous knowledge improvement for professionals. You have made it possible through your generosity, by sharing your skills and time. We have become a resource, paying it forward to sister Sections and MAs. Now that is best practice!
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Training Report
By Catrice R. Jones, CAE, NC AWWA-WEA Educational Events Manager

As I sit here contemplating how to make a training report sound exciting, I refer to our website and am reminded of our Vision and one of our Strategic Goals for the next three to five years. Looking at these items only reiterated what I already know… these things cannot be accomplished without our volunteers!

Daily, I come in contact with various volunteers, members, and industry professionals who overwhelm me with their dedication not only to their own professional growth but also to the growth of the industry. They are consistently devoting hours upon hours of their personal time to formulate new ideas and develop new training opportunities for their peers in the water and wastewater industry. In addition, these volunteers are thinking of new and exciting ways to deliver the training that is needed to develop the future industry leaders. They provide NC AWWA-WEA with the insight into the topics and types of training that employers find valuable for their employees.

2014 Training Review
Below is the final list of the courses that have been offered in 2014 thus far. Visit our website (www.ncsafewater.org) for the most up-to-date information on future events or call the office at 919-784-9030.

<table>
<thead>
<tr>
<th>2014 DATE</th>
<th>EVENT</th>
<th>LOCATION</th>
<th>COMMITTEE</th>
<th># ATTENDED</th>
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<tr>
<td>February 19</td>
<td>Communicating Your Utility’s Financial Position to Your Board and Customers</td>
<td>City of Greensboro Operations Center – Greensboro, NC</td>
<td>Finance &amp; Management</td>
<td>28</td>
</tr>
<tr>
<td>March 10 - 14</td>
<td>Eastern Collection and Distribution School</td>
<td>NCSU McKimmon Center – Raleigh, NC</td>
<td>Collection and Distribution Schools</td>
<td>554</td>
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<tr>
<td>April 6 - 8</td>
<td>NC AWWA-WEA Spring Conference</td>
<td>Wilmington Convention Center – Wilmington, NC</td>
<td>Spring Conference</td>
<td>407</td>
</tr>
<tr>
<td>April 15</td>
<td>Sustainable Practices in Water and Wastewater</td>
<td>UNC Charlotte</td>
<td>Sustainability Committee</td>
<td>22</td>
</tr>
<tr>
<td>April 28 - May 2</td>
<td>Eastern Biological Wastewater Operators School</td>
<td>NCSU McKimmon Center – Raleigh, NC</td>
<td>Wastewater Schools</td>
<td>149</td>
</tr>
<tr>
<td>April 29 - May 2</td>
<td>Physical/Chemical Wastewater Operators School</td>
<td>NCSU McKimmon Center – Raleigh, NC</td>
<td>Wastewater Schools</td>
<td>62</td>
</tr>
</tbody>
</table>

The dedication of volunteers is what energizes our association and allows us to provide the services and educational programs that keep NC AWWA-WEA moving forward and venturing into new territory. Just like any type of change, these new ventures may be scary. However, we all know that in order to grow we must change. Therefore, I would like to thank our wonderful volunteers for pushing NC AWWA-WEA to new heights. I am excited and can hardly wait to see what the year has in store for us! ☺️
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Summary of the NC SECTION AWWA and NC WEA Board of Trustees Meetings
November 13, 2013. Chaired by Mike Osborne, in Concord, NC.

The following actions were taken during this meeting:

1. Received a report from AWWA Visiting National Officer John Alston, AWWWA vice president, thanking the Section for its hospitality and encouraging other national officers to deliver papers at the conference. WEF Trustee Charles Bott had to leave the conference earlier that morning, but his appreciation was relayed by Jeff Payne.

2. Chair’s Report:
   a. The board received a report from Chair Osborne, who detailed five initiatives that he will focus on during his year as chair:
      i. Education and training at conferences – seek information from utility directors to ensure that our product meets requirements, also offer more ‘hands on’ training.
      ii. Professional development and networking – link Young Professional socials and membership appreciation activities to reach more members.
      iii. Creation of career ladders – Tyler Highfill has been appointed to chair a task force to study this and provide recommendations for board review.
      iv. Succession planning – Chair Elect Belk will work on drafting roles and responsibilities for committee chairs and vice chairs and all committees will be encouraged to complete ‘playbooks’ to ensure continuity of committee work. Executive Director Roberts and staff will develop a template to assist with filling staff vacancies.
      v. Membership recruitment, renewal and engagement – engagement of Membership 180, an outside consulting firm, is recommended to allow for a one-day workshop to provide tools and ideas for an expanded emphasis on membership recruitment and the engagement of members in the association, and to allow for a high rate of renewal.
   b. Liaisons were appointed as follows: David Saunders to Annual Conference Council; TJ Lynch to External Affairs Council; Jon Lapsley to Technical and Education Council; and Lori Brogden to Schools Council.
   c. Dates and locations for meetings – March 13 at McKim & Creed office in Raleigh; May 15 board meeting in the morning at the Greensboro Coliseum, followed by an afternoon board/committee workshop; July 18 in Asheville; September 18 in Charlotte; and November 16 and 19 in Winston-Salem.

3. Executive Director’s Report:
   a. The board received a schedule of insurance policies in place with policy numbers, policy limits, expiration dates and deductibles.
   b. The board received a schedule of all bank accounts and CDs held by the NC Section AWWA and NC WEA, including maturity dates.
   c. The board approved purchase of annual conference cancellation insurance.
   d. Audit and tax preparation activities are underway, with auditors expected in the office in January. Lori Brogden disclosed for the record that her daughter is employed by the audit firm Langdon and Company, but does not participate in the audit.
   e. The board received an overview of the 40 policies currently approved by the board.

4. Governance Discussion: FY 2014 Budget Overview
   a. The board determined that no further review of the FY 2014 budget that was approved November 10, 2013 was required.
   b. Approved retitling the Finance and Management Committee to Utility Management Committee. Elaine Vastis Conte is the chair. She has committed to incorporating a focus on purchasing and procurement training.

5. Action Items
   a. Approved a conflict of interest policy, to be signed by all members of the board.
   b. Approved a banking resolution, establishing signatories for 2013 – 2014, consistent with the signatory policy of the board.

6. Consent Calendar:
The board accepted verbal committee reports from:
   a. Jackie Jarrell, who reported on the work of the Joint Public Education Committee’s Backflow Task Force, which is attempting to clarify the jurisdiction under state agencies for backflow regulation;
   b. Mark Wessel, who reported on the lingering issues with Association of Boards of Certification (ABC) over the maintenance technologists exams Grades 1- 3, and failure by ABC to proceed with development of a Grade 4 exam. In an effort to resolve these issues, he reported that he, Dell Harney, Catrice Jones and Lindsay Roberts will attend the ABC conference in Charleston to meet with ABC Leaders.
   c. Approved committee chair appointments as recommended by Chair Osborne.

7. Other Business:
   a. Assigned to the Sponsorship Committee a review of single company sponsorship of items, such as lanyards.
   b. Accepted Steve Shoaf’s offer to serve as vice chair to the Awards Committee, and assigned to the Awards Committee further review of award criteria.
Summary of the NC SECTION AWWA and NC WEA Board of Trustees Meetings
January 23, 2014. Chaired by Mike Osborne, in Charlotte, NC.

1. Strategic Governance Discussion:
   • Discussed development of utility specific training: Betsy Drake, council chair for the Training and Education Council, was tasked with reaching out to utilities, to see what their training needs are for the future. A new format for training has been developed to meet specific needs of the City of Raleigh, which will serve as a prototype. NC AWWA-WEA's business model will need to be re-evaluated.
   • Reviewed initial Membership 180 workshop outcomes.
   • ABC Certification – maintenance tech issues – received a verbal summary of the meeting with ABC in the effort to gain a commitment for the maintenance tech Grade 4.

2. Action Items
   a. Approved a request from Water For People for an additional 5K run in Raleigh; also approved a separate registration process for Water For People events, with additional costs to be covered by increased registration fee for participants.
   b. Ratified December 2, 2013 e-vote to send a letter to federal elected representatives supporting HR3588, which provides an exemption for fire hydrants from the lead rule.
   d. Approved the nomination of Jackie Jarrell for the position of Water Environment Federation (WEF) Trustee.
   e. Approved the Executive Director’s annual goals and provided a bonus for all employees.
   f. Approved the Executive Director’s annual employment agreement.

3. Chair's Report
   • Selected the Williamsburg AWWA RMSO May 2 and 3, 2014, and the Charleston Water Environment Federation Member Association Exchange May 21 – 23, 2014 to allow for more board interaction.
   • Reviewed changes proposed by the Sponsorship Committee, chaired by Tommy Esqueda. Up to four sponsors per seminar will be permitted.
   • Reviewed progress of the Career Ladder Task Force.
   • Changed the July board meeting date to August 1, with a board dinner to take place on July 31.

4. Executive Director’s Report
   • Reviewed the membership report, showing that membership has declined slightly as of year end 2013. Congruence in benefits is recommended for utility members from the American Water Works Association (AWWA) and WEF.
   • Reviewed preliminary year-end financial reports showing a net income projection of approximately $70,000, largely due to reduction in projected expenses. Net income helps keep prices for dues and services to members lower than would otherwise be required to cover long-term capital expenditures for such items as new member database, which will also require use of reserve funds.

5. Consent Calendar:
   AWWA Director Steve Shoaf provided a verbal report that he has been selected as a vice president of AWWA; Phil Singer has been selected as the winner of the Abel Wolman Award; and Past Chair Terry Rolan will receive the Outstanding Service Award.
   AWWA is working with India on the ‘India Initiative,’ a 3-year pilot to help professionalize training of water professionals in India and reduce water loss. AWWA is also collaborating with ASCE and Engineers Without Borders on infrastructure projects inside the US.
   a. Approved Minutes of the Board meetings of November 10 and 13, 2013;
   b. Approved the Treasurer’s Report with a balance sheet reflecting unrestricted assets of $763,565.55 and endowment funds of $313,208.69 as of December 31, 2013.
   c. Approved committee reports as provided to Secretary George Simon, Jr. through January 10, 2014.

6. Other Business:
   • Jonathan Lapsley reported that six units of e-learning will be available for purchase in February.
   • Received a letter of appreciation from Wake County Hospice for a donation in memory of Cindy Gall’s father.
   • Reviewed draft minutes for the annual business meeting of November 2013, which will be formally approved in November 2014. No changes were required.
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we are so EXCITED!

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(This list is current as of 3/3/14)

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<th>Chair</th>
<th>Company/Address</th>
<th>Phone</th>
<th>Email</th>
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<tbody>
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<td>Nominating/Canvas</td>
<td>John McLaughlin</td>
<td>GHD</td>
<td>(704) 342-4919</td>
<td><a href="mailto:john.mclaughlin@ghd.com">john.mclaughlin@ghd.com</a></td>
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### Conference Coordinating Council

<table>
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<tr>
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<th>Company/Address</th>
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</thead>
<tbody>
<tr>
<td>Annual Conference Local Arrangements</td>
<td>Courtney Driver</td>
<td>City of Winston-Salem</td>
<td>(336) 747-7315</td>
<td><a href="mailto:courtdriver@cityofwvs.org">courtdriver@cityofwvs.org</a></td>
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<td>Awards</td>
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<td><a href="mailto:ayecoombes@mckimcreed.com">ayecoombes@mckimcreed.com</a></td>
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<td>Exhibits</td>
<td>Jim Anderson</td>
<td>Daparak</td>
<td>(704) 323-7031</td>
<td><a href="mailto:janderson@daparak.com">janderson@daparak.com</a></td>
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<tr>
<td>Sponsorship</td>
<td>Julie Taylor</td>
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<td>(336) 292-2271</td>
<td><a href="mailto:julie.taylor@arcadis-us.com">julie.taylor@arcadis-us.com</a></td>
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<td>2014 Spring Conference</td>
<td>Kelly Ham</td>
<td>McKim &amp; Creed</td>
<td>(919) 233-8091</td>
<td><a href="mailto:kham@mckimcreed.com">kham@mckimcreed.com</a></td>
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### External Affairs Council

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<td>Communication</td>
<td>Sherron Moore</td>
<td>City of Concord</td>
<td>(704) 920-5415</td>
<td><a href="mailto:moore@concordnc.gov">moore@concordnc.gov</a></td>
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### Technical Program Council

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<tr>
<th>COUNCIL CHAIR</th>
<th>Chair</th>
<th>Company/Address</th>
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<tr>
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| Regulatory Affairs | Ron Hargrove | City of Winston-Salem                | (336) 747-7312 | ronh@cityofwvs.org          |
| Resource Recovery and Reuse | Jean Creech (co-chair) | Charlotte Mecklenburg Utility Department | (704) 301-4042 | jcreech@charlottenc.gov     |
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| Wastewater Collections & Water Distribution | Michael Kirby | Woolpert                             | (704) 525-6284 | michael.kirby@woolpert.com  |

### Schools Council

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For more committee information visit individual committee web pages on www.ncsafeewater.org.
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Technical Program Council

Focused on the education and training of Association membership, the Technical Program Council encompasses the 12 committees that develop the technical content for the various seminars, workshops, eLearning programs and conferences that the Association hosts throughout the year. In addition to facilitating communication, the Council helps with committee work planning and budget development. Specifically, the Council compiles the work plans and budgets provided by each committee, and assists with coordinating and prioritizing the work. “This helps make sure the committees do not have overlapping work and that they are aware of opportunities to work together towards common goals,” says 2014 Council Chair Betsy Drake, utilities engineer with the Town of Cary.

The Council meets two to four times per year, generally by conference call. At every meeting, a representative from each committee provides an update of the committee’s activities. “These updates provide an opportunity for committees to stay informed and get help and support from one another,” notes Drake. The meetings are also an opportunity for sharing information, such as new initiatives, from the board of trustees.

At the February 2014 meeting, the committees identified several opportunities to work together. “The committees generally work very independently, and it is exciting to watch the exchange of ideas when they are brought together,” says Drake.

Outside of the meeting times, the Council chair works individually with committees to help ensure their work plans and budgets are completed each year. The chair also compiles updates from each committee to provide to Board members at their meetings.

“The volunteers who make up the members of the committees of the Technical Program Council devote a lot of time and contribute some really great ideas to help make the goals of the Association happen,” says Drake. “Through their hard work and commitment, we are building a stronger NC AWWA-WEA.”

eLearning Task Force

In February 2014, the Association launched a new online web based training program. Since then, a total of 8.5 hours of online training have been made available to members.

The rollout and activation of the online learning system is the product of two years of work by the eLearning Task Force. “The committee is very excited to have rolled out the program,” says Chair Jonathan Lapsley of CDM Smith. “We encourage our members to take a look at the available course offerings and try out one of the modules.”

The task force was formed in 2012 to investigate the possibility of providing more diverse training options, specifically online web-based training and webinars that would allow remote access to training content, thus reducing travel costs and the impact of staff absences for employers. Members of the committee originally consisted of chairs and/or vice chairs of the committees that constitute the Technical Program Council, as well as specific members of the Conference Coordinating Council and the Schools Council. This composition ensured a vision consistent with the training goals of the Association.

After investigating alternatives for online/distance learning, the task force was asked to implement the program as soon as possible. Earlier this year, its efforts came to fruition.

To date, the content has originated from the board of trustees. “We intend for this new training tool to become an integral part of the training program offered by the Association,” says Lapsley, adding that the plan is for the available courses/modules to continue to grow as the task force looks for ways to expand offerings through collaboration with other membership associations. “If you do take one of the courses, please provide feedback so we can modify the system to provide the greatest benefit to those who use it.”

Seminars & Workshops Committee

On December 3, 2013 the Seminars & Workshops Committee delivered its first-ever U-Pick Seminar. Titled “Putting the Pieces Together: Understanding the Right Steps to Take When Planning for Future Investments of Your Utility’s Infrastructure,” the asset management presentation was
held at Pfafftown’s PW Swann Water Treatment Plant and hosted by Winston-Salem Utilities.

“It was very well-received,” says Chair Erika Bailey, a consulting engineer with HDR. Subsequently, in 2014, the committee organized three more U-Pick Seminars: one in the City of Eden, one in the city of Raleigh, and one in the City of High Point. The seminars focus on wastewater optimization and biological nutrient removal. The committee is also hoping to hold its first webinar at some point during the next few months. These are all over and above the regular seminars the committee organizes.

“We spend time figuring out what topics will be timely for this year,” notes Bailey. In July, the committee will host a Drinking Water Rules and Regulations Seminar, followed by Planning Ahead for the Future of Wastewater Regulations. It was after volunteering as a presenter for these kinds of seminars that Bailey first joined the Seminars & Workshops Committee. “In 2002, one of the workshop planners, Ken Vogt, reached out to me,” she recalls, adding that the Wastewater Troubleshooting Seminar that she represented became a mainstay for the committee. “We would change the topic but it was the same concept or theme.”

Becoming a committee member was a natural transition. She gradually became more involved with the planning of the wastewater troubleshooting seminars, eventually becoming chair of the Seminars & Workshop Committee. “I really find volunteering with professional association activities rewarding and fun,” says Bailey, adding that she had previously been very active in Virginia’s professional association when living and working in her home state. “That is something I have always been passionate about.”

In fact, at the Virginia association annual conference, she once presented a Young Professional’s breakout session about how volunteering is helpful in building a career. “Along with making personal connections in your field,” she told them, “getting involved with a committee, facilitating meetings and assuming responsibility for organizing events builds skills that translate to your daily work.”

Recently, Seminars & Workshops added the role of secretary to the committee, thus giving more members the opportunity to volunteer in an officer position, while freeing up the vice chair to participate more actively during meetings. Almost every member of the 25-person committee helps with at least one seminar, either on the day of the event or with planning or presenting. “We also tap heavily into speakers who are not part of the committee,” notes Bailey, adding that the Seminars & Workshops Committee puts on around a dozen seminars per year. “In addition, when other committees put on seminars, we help with registration and any logistical questions. It is all part of helping provide training opportunities that keep our members up to date.”

Automation Committee
The Automation Committee continues to focus its attention on providing training activities to help support the Association. Last August, the committee organized an Operator’s Training event, “Improving Operator Effectiveness Through Automation”, that attracted 55 operators. This was followed in February, by a webinar titled: “SCADA Saves You Money: Practical Solutions Utilities Can Implement Now.”

Another webinar, to be delivered in May/June by Security Subcommittee Chair Don Dickinson, will focus on cyber-security. “AWWA recently created a web tool to provide cyber-security guidance on their national webpage,” notes Chair Greg Czerniejewski, adding that he and Dickinson delivered a presentation on the available guidance at South Carolina’s Environmental Conference in March.

Following the webinar, Dickinson will be meeting with the subcommittee to plan a strategy for further dissemination of this information. The webinar, and many others, have also been recorded for future use by the NC AWWA-WEA.

In August 2014, volunteers from the Automation Committee will once again offer another operator training event. Titled “Addressing Operational Challenges Through SCADA,” this seminar will explore several case studies in which municipalities addressed their operational challenges with the use of SCADA and other automation technology.

At some point this year, the 15 to 24 active members of the Automation Committee will also be assisting Risk Management in planning a seminar. Encouraging cooperation among committees is one of the Association’s ongoing initiatives, which also include having each committee create a compilation of its history and activities.

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Explains Czerniejewski: “We pulled our history document together last year and will update it annually as part of our submittal to the board that also includes our budget and upcoming activities.”

Other Automation Committee initiatives are still in the planning stages. They include planning a Spring Conference forum that would serve as a resource to the utilities, and potentially offering professional development hours (PDHs) for attending some of the committee meetings. Updates will be available over the coming months.

Utility Management Committee
In November 2013, the Finance & Management Committee became the Utility Management Committee to allow for an expansion of topics covered through its work. “Our committee has always covered various financial and managerial topics,” says Chair Elaine Vastis Conti, “but now we can include additional areas of interest such as procurement challenges, etc.”

The committee organizes technical sessions and seminars on issues pertinent to the members of the NC AWWA-WEA. In 2013, a Billing and Collections Systems workshop encompassed a number of topics, from how to choose the right billing system for your utility to how to mine customer usage data and analyze it effectively to help select the right rate structure. Other topics included whether or not it makes sense for a utility to outsource the billing, printing and mailing of their bills as opposed to doing these functions in-house; how to choose among the various payment options (IVR, kiosk, etc.) and which ones meet your objective; trends in billing methods such as e-billing, mobile billing, etc., and the pros and cons of each method; and benefits of different collection methods such as lock box, remittance processing, etc.

Conti notes how rewarding it is to interact with staff from various utilities and learn from their challenges and unique circumstances. “I feel our committee provides opportunities for utility staff to learn from their peers,” she adds. “Therefore, our workshops and webinars are tools that can be used for utility staff to expand their professional development.”

In 2013, the committee hosted a 1½-hour webinar titled “Introduction to Financial Management Tools,” which introduced participants to numerous online financial management and assessment tools created by various industry associations for use by water and wastewater utilities. Over the past year, five new members have joined, boosting membership on the committee to approximately 30, of which 10 to 15 are very active.

Industrial Committee
Last December, the Industrial Committee (IC) held a successful Industrial Water Reuse and Conservation Seminar in Clayton, NC, with approximately two dozen people in attendance. “It is the first seminar we have hosted in five years,” says Chair Katie Jones. “We were very encouraged by the turnout.”

Along with quarterly conference calls, the committee holds face-to-face meetings during industrial facility tours and equipment manufacturing facility tours at least three times a year. For example, last fall, the IC hosted a well-attended vendor lunch and learn on alternative aeration technology (BlueInGreen).

In March 2014, the Industrial Committee toured the Amiad filter manufacturing facility located north of Charlotte. The committee is also planning several other events for the coming year. “This summer, instead of having a formal meeting or seminar, one thing we hope to do is to have a workshop focusing on issues from an operational perspective,” says Jones. “The discussion would include mitigation tactics available when an industrial wastewater treatment plant is in an upset condition or the operation is compromised, as well as preventative measures to minimize potential recurrence.”

Jones points out that North Carolina has had an unusually hard winter, which has affected the microbiology on which biological wastewater treatment plants...
depend. The seminar would be organized in a forum style to allow for more in-depth discussion of these and other issues. The Industrial Committee invites members to watch for announcements to this seminar and other events.

Regulatory Affairs
During 2014, the Regulatory Affairs Committee has continued its role of sharing news, information, and ideas to the Association membership through planned meetings, seminars and articles. Formed in 2013 by the merger of the former Government Affairs and Water Resources Committees, the committee has a membership of 152 volunteers. Its mission also includes providing education and training opportunities to members on issues, regulations, and public policy affecting the management, quality, and protection of water resources.

The North Carolina legislature was very active in the 2013 long session, with the further development of many potential legislative ideas by the Environmental Review Commission and the Legislative Review Commission. Both of these boards have initiated study committees to consider and/or propose potential legislation on issues such as local environmental ordinances, water/sewer statutory models, review of technical engineering plans, public enterprise use of funds, and Jordan Lake rules. “We expect the outcome of these study committees to be reflected in legislative proposals in both the short session of 2014 and the 2015 long session,” notes Ron Hargrove, chair of the Regulatory Affairs Committee. On behalf of the Association, the committee will be tracking these proposals and sharing the details, as necessary.

The committee is planning its first face-to-face meeting in June 2014 in the Research Triangle Park area. Three topics will be addressed: the current status of the Division of Water Resources priorities, an ecological flows modeling update, and a regulatory update by a representative from the League of Municipalities.

One of the committee’s annual goals is to assist the Program Committee in selecting a topic and speakers who will add value to the panel discussion at this year’s Annual Conference. The theme for this year’s panel discussion is being developed around the theme ‘Expect the Unexpected,’ to encourage utilities to broaden emergency preparedness and planning. The topics for the two panel discussions will focus on two recent, but significant, incidents in North Carolina that involved emergency response to an illicit discharge.

Ultimately, the committee would like to meet face-to-face twice a year, with teleconference available to those who cannot attend in person. The committee welcomes members from across the industry, including managers, operators, consultants, and regulatory agency representatives, providing ample opportunity for discussion and mutual education.
At one point or another, all members of the NC AWWA-WEA will likely deal with any of a wide range of risks, including safety challenges, disasters, emergencies, business continuity, or financial and legal risks. In 2012, then-Association President John McLaughlin spearheaded a move to merge the Safety Committee and the Disaster Preparedness Committee into the Risk Management Committee for a more comprehensive approach to member needs.

The Risk Management Committee helps Association members prepare for risk by providing regular training, including seminars and webinars; submitting regular articles on risk management to NC Currents magazine; and coordinating with various NC AWWA-WEA committees and other organizations, such as the national AWWA Emergency Preparedness and Security Committee.

In order to fulfill these functions, the committee’s 25 members make a point of staying abreast of water sector trends relevant to risk management and preparedness. “I learn new things from my fellow committee members at each meeting,” notes Past Chair Jack Moyer, who chaired the Disaster Preparedness Committee before serving as the first chair of Risk Management in 2012-2013. “I enjoy the networking and fellowship with my fellow committee members and the opportunity to help NC water and wastewater systems with their preparedness.”

The national water security and preparedness practice leader at URS Corporation for the past eight years, Moyer also spent 29 years in the municipal sector with the City of Raleigh, where he had many opportunities to deal with disasters and safety issues. He brings strong experience, expertise, relationships, and communication skills to his work on the committee.

In 2012, the Risk Management Committee conducted a pilot webinar for the Association, a lunchtime event dedicated to NC Water/Wastewater Agency Response Network (NC Water WARN). Over the past year, the committee has conducted a successful one-day seminar and another lunchtime webinar. Other initiatives have included networking with the Cyber Security Sub-Committee of the Automation Committee to address cyber, IT, and SCADA risks.

Since its inception, the Risk Management Committee was co-chaired by the City of Greensboro’s Barry Parsons, who became the chairperson in January 2014. Elijah Williams, also from the City of Greensboro, will serve as co-chair.

Plans for the upcoming year include a one-day seminar on top issues in risk management for water and wastewater utilities. The committee will also be conducting the Association’s first-ever hybrid seminar/webinar. “We will continue to provide articles for NC Currents and the AWWA Journal and present papers at state and national conferences,” adds Parsons. “The committee is always seeking new members with interest and/or expertise in risk management, particularly on the safety side of what we do.”

The for-credit seminar “Glass Half Full: Finding Ways To Do More With Less and Finding Ways To Make What We Have More Sustainable,” held in Winston-Salem last fall, was one of the many successful activities organized by the Wastewater Collections & Distribution Systems Committee over the past year. Events like this are an important part of the committee’s mission to support, educate, and represent the membership of NC AWWA-WEA regarding issues dealing with the operation, maintenance, planning, and management of wastewater collection and water distribution systems.

“We assist the Schools Committee by providing speakers for their advanced day seminars, which are held three times per year,” adds Chair Michael Kirby. “We also awarded Collection System of the Year awards at the annual conference and we are working towards a Distribution System of the Year Award for this year.”

Kirby is back at the helm after chairing the committee in 2006, before the current officer progression was established. Presently, the committee rotates the chair every year, with a defined progression from secretary to vice-chair to chair.

“So becoming an officer is a three-year commitment,” notes Kirby.

The committee currently has about 30 members who attend at least one meeting a year, with a core group of 12 regulars who attend every bi-monthly meeting either in person or via conference call. The meeting location is rotated within the central part of the state.

Kirby attended his first meeting of the
Wastewater Collections and Distribution Systems Committee in November 2004 at the Annual Conference. “I was invited by another member at the conference and have been on it ever since,” he recalls. “I think the Wastewater Collection and Water Distribution Committee has been a great way to get involved in the NC AWWA-WEA. I have learned a lot from my peers and made some good friends. Volunteers help make this organization great and the spirit of volunteerism is strong within this committee.”

Resource Recovery & Reuse Committee

Created in the fall of 2013, the Resource Recovery & Reuse Committee merges the Residuals Management and Groundwater Committee with the Reuse Committee in order to develop, recommend, and conduct programs that promote understanding, acceptance, and development of safe and beneficial recovery and reuse of resources generated at water and wastewater treatment plants.

“The committee recognizes that the unsustainable use of natural resources such as water, nutrients, carbon, and natural gas can be limited by the beneficial reuse of alternative resources already available at water and wastewater plants,” says the City of Raleigh’s Marla Dalton, who co-chairs the committee with Jean Creech from the Charlotte Mecklenburg Utility Department (CMUD). “This committee also advocates that any recovery and reuse shall be performed safely, without adversely affecting public health or the quality of other natural resources, including groundwater and surface water.” Beneficial reuse refers to the following: disinfected tertiary treatment plant effluent, stabilized biosolids, biogas, water treatment plant residuals, stormwater, and industrial byproducts useful in water and wastewater treatment operations.

Consisting of approximately 75 members, the committee meets quarterly, in person and by conference call. “We are currently scheduling meetings that will include a facility highlight and tour,” notes Dalton. “We are hoping we can get this approved for continuing education and professional development hours.” A full-day seminar scheduled for September 4, 2014, will include talks on beneficial use of biosolids and reclaimed water.

Hoping to act as a forum for members to share ideas, the committee is aiming to provide several professional development opportunities for members while strengthening member participation within the Association and relevant external organizations. As such, fostering partnerships with community organizations, water utilities, industry, academia, and other NC AWWA-WEA committees is an important part of the committee’s mandate, which also includes acting in an advisory role to facilitate public policy making.

To strengthen this role, the Resource Recovery & Reuse Committee will focus its efforts on several specific activities. One of these will be assessing and promoting the safe and beneficial use of reclaimed water. Another is the assessment and promotion of the safe and beneficial use of residuals and biosolids as alternative land application fertilizers, fuels, or raw materials. The committee also hopes to act as an industry-wide forum for discussions of technical, regulatory, and political issues related to resource recovery and reuse in NC. Educational materials will be developed for targeted audiences, with a list serve and public electronic bulletin boards further supporting communication.

On the professional development front, activities will include soliciting or inviting relevant resource recovery papers to be presented at the Association’s conferences. Separate from the conference, plans are underway to organize an annual specialized seminar that focuses on resource recovery and reuse. The committee will also be involved in supporting the Annual Spray Irrigation School for the purpose of training and certifying wastewater plant operators, and the Annual Land Application School for the purpose of training and certifying land application operators.
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What we see in the latest climate change science is not only a prediction that the intensity of events will increase, but also the frequency of events.

- Ben Stanford, Director of Applied Research at Hazen and Sawyer
As Schnabel’s business developer and marketing manager, Lori Brogden identifies business opportunities to enhance the engineering firm’s sales and marketing strategy. “I am an advocate for clients and like to think of myself as a matchmaker,” says Brogden. “I prefer to match clients with project managers according to personality and needs.”

She notes, only half-jokingly, that combining the Myers-Briggs personality type indicator with instinct has come in handy over the years. Certainly her negotiating skills have been invaluable at times. Thanks to the relationship she develops with clients, they feel comfortable enough to confide their questions and concerns. She then passes on these insights so project managers can better meet clients’ needs. “I cannot stress enough the importance of client contact through meetings, debriefs, committee interaction and project checkup interviews,” she explains.

This unique set of skills helped Brogden move from receptionist to secretary, then to marketing coordinator, which led into business development when she worked for a firm specializing in groundwater and other environmental issues such as remediation, risk assessments, air quality and water quality in the 1990s.

Her first exposure to the environmental industry was in the late 1970s, when she accepted a position as an administrative assistant for an engineering and land development firm near Washington, DC. “My supervisor was an engineer working at the forefront of sludge treatment and disposal and quite passionate about his field of expertise,” explains Brogden, noting he was one of the experts selected to update WEF’s Solid Process Design Management Manual in 2012. “I was hooked with the first bag of composted sludge he gave me for my flower garden.”

It was this passion, along with her ability to connect with people, which propelled her through the ranks of Geraghty & Miller – later Heidmij and now ARCADIS – throughout the 1990s. Near the end of her time with the company, she became increasingly involved in business development. “We had an exceptional group of scientists and engineers dedicated to sustainability before it was a household word,” recalls Brogden. “I had an outstanding mentor. Among the many things he taught me was that, to be a success, you must always share and never knock the competition. So that is what I do. I share as much as I can with clients and others in my business and it always comes back to me.”
With sharing and networking becoming increasingly important, Brogden decided to join NC AWWA-WEA to connect with other water professionals. “In 1998, the executive director asked if I wanted to help her with registration during the Annual Conference I was attending in Asheville,” explains Brogden. “Once I started meeting all the people and saw how friendly they were, I couldn’t resist. It was also the best place to meet all my clients and sit in on sessions to keep abreast of developments in the industry.”

After leaving ARCADIS, Brogden worked a short time in an environmental laboratory, gaining yet another perspective into the sector. She then worked as Marketing Manager with Stearns & Wheler, now GHD, before joining Schnabel as associate in 2005. As her career progressed, so did her involvement with the Association.

In 2000, Les Hall invited her to join the Program Selection Committee, where she served until 2014 and was moderator at the conference. “Being involved gives me the opportunity to interact with other people in the industry and use my leadership skills,” says Brogden. Since 2002, she has served on the Local Arrangements Committee for the Spring Conference and chaired the 2010 New Bern event. Other committees on which she has been a member or chair include Nominating, Communications and Seminar & Workshops. She was also board secretary for three years and currently serves as trustee.

One highlight of her involvement was being a part of the search committee for a new executive director. “When I met Lindsay Roberts, I was immediately impressed by her credentials, enthusiasm and talent,” she recalls. “Her leadership has transformed the organization beyond the level we had envisioned five years ago.” The day the committee selected Roberts, Brogden and Les Hall were so excited, they immediately left the meeting to call her about accepting the job.

That is the kind of enthusiasm Brogden brings to all her work with the Association. Over the years, she has taught at the Collection & Distribution Schools and delivered many seminars, on subjects ranging from public relations and customer service to stress management and personnel issues. She continues to enjoy sharing her skills and experience with colleagues, sometimes playing ‘matchmaker’ to create partnerships and collaborations. “I love the passion and dedication of the people in the water environment industry,” says Brogden. “Although I am not a scientist or engineer, my job as a business developer and marketer is part of the process, which makes me part of the solution.”

In 2007, the distinguished Select Society of Sanitary Engineers (SSS) recognized her dedication to the Association by inviting her to become a member. This honor was followed, in 2010, by a Certificate of Appreciation for her work with the NC AWWA-WEA.

Brogden is just as appreciative to the Association for all it has brought, and continues to bring, to her life and career. “This Association has the best volunteers,” she says. “They actually do what they say. They are self-starters and creative. Best of all, we have a group of volunteers who are fun. They are not just volunteers and clients – they are my friends.”

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Kevin Plemmons
Both Sides Now

Kevin Plemmons recent return to McKim & Creed’s Wilmington office has brought him full circle in a journey that has taken him from the private sector to the public sector and back again. After three years with the City of Concord, he is happy to be back at ‘the beach’ with the same group of colleagues and the same boss. He, on the other hand, is far from the same engineer.

Working for Concord offered Plemmons a wonderful opportunity to gain invaluable experience in municipal water, wastewater, and stormwater systems. At the time, it was an unexpected detour – though hardly the first in a career path that has been anything but direct.

Early on, Plemmons knew he wanted to become an engineer. “I was always building something,” he recalls, describing a childhood filled with Legos, Lincoln Logs and Tinker Toys. Certain of his calling, he enrolled at The Citadel, The Military College of South Carolina to pursue a degree in civil engineering.

But not everything was as clear as he thought. “When I was in college, water and wastewater were the furthest things from my mind,” he notes, explaining that the field seemed too precise and technical. “You had to take everything out to the fourth or fifth significant digit,” he says. “It just seemed so exacting. I thought it would be extremely stressful.”

In fact, after graduating, Plemmons accepted a position with the North Carolina Transportation Department. “I lasted all of six months there before I decided it was nowhere close to what I wanted to be doing,” he recalls.

So when an opportunity came up to work as an engineer intern with McKim & Creed in – of all things – municipal water and wastewater, Plemmons decided to take a chance. His first big project involved doing hydraulic modeling on the wastewater system for a countywide master plan. “I was thrown into the fire immediately,” he laughs. “That is when I realized that it is not as precise and exacting as I had thought. There is a lot of creativity involved.” He realized he had found a job he enjoyed.

Then four years later, the recession hit and the market dried up. Working on the municipal side, Plemmons was not immediately affected. Then a year later, his position was reduced to half time. Suddenly, paying the bills was no longer feasible.

Another situation Plemmons had never envisioned was working on the government side. In fact, during the interview with the City of Concord, his prospective boss questioned his willingness to adapt to the public sector. “I am hard-headed,” admits Plemmons. “When somebody tells me I do
not want to do something, that makes me want to do it all that much more.”

At Concord, he started as a water project engineer. Within a couple of months in this position, he earned his designation as a professional engineer. Then about a year ago, water, wastewater, and stormwater were combined into the Water Resources Department and Plemmons assumed responsibility for the engineering and program side of the entire department.

“I have thoroughly enjoyed my time with the City,” he says. At the same time, these last few years have also given him the opportunity to become more acquainted with the Professional Engineers of North Carolina (PENC) and the NC AWWA-WEA.

The first time he was with McKim & Creed, his boss strongly encouraged him to join the Association. “At that point, I did not really see the benefit of it,” he recalls, adding that it was only after he started attending the conferences and reading the magazine that he began to appreciate the value of membership. “Learning about the innovative things that other people are doing was really when being part of the NC AWWA-WEA started to hit home for me.”

Government tends to be quite cautious when adopting new ideas, he explains. A new technology or approach has to have a proven track record before being seriously considered. Referencing how other members have made something work can go a long way to driving innovative approaches in the municipal sector. “It is really helpful to have that networking capability,” notes Plemmons. “I can call these people and talk to them about what works well or what can be done differently. They are more than happy to help.”

Although he values the role of the Association, over the past few years, his professional activities have focused mainly on PENC. He was chair of the Professional Engineers in Government Interest Group, and also has been involved in Regulatory Reform. The Regulatory Reform group worked on the language helping to shape section 58 of HB 74 (the Omnibus Environmental bill), headed for the NC Legislature, that defines the rules for regulatory review of professional engineers. Since leaving the City of Concord, Plemmons has had to resign his position as chair. “It has been very rewarding to see something happen at that level, thanks to some of our ideas,” he notes.

Equally rewarding has been the opportunity to return to McKim & Creed’s Wilmington office equipped with the knowledge and experience he gained at the City of Concord. “It is very helpful knowing both sides,” he explains. Coming to the government side from the private side helped him understand how consultants work and what they need in order to accomplish their work. Now, he also has a good understanding from the government side of how projects are selected and what some of the drivers may be.

“I think it has made me a much more well-rounded engineer,” says Plemmons, adding that, despite his former misgivings, he has found his calling in the field of water and wastewater. “At this point, I could not imagine doing anything else.”
Plant Spotlight:
French Broad River Water Reclamation Facility,
Metropolitan Sewerage District of Buncombe County, NC

Information provided by Peter Weed (Director of WRF Treatment & Maintenance), Hunter Carson, PE (Project Manager, Capital Improvement Division) and Ed Bradford, PE (Director of Capital Improvement Division). Article created by David Hamilton, PE / ARCADIS (NC AWWA-WEA Plant Operations & Maintenance Committee).

General
The Metropolitan Sewerage District of Buncombe County (MSDBC) was created in 1962 as a non-profit, publicly-owned utility in the Blue Ridge Mountains of western North Carolina. MSDBC includes the City of Asheville and 15 surrounding communities and water and sewer districts. MSDBC wastewater is treated at the French Broad River Water Reclamation Facility (WRF), which started operation in 1967 and now serves a population of 135,000. The French Broad River treatment facility is one of the largest rotating biological contactor (RBC) plants in the world. Average daily wastewater flow sources are 50% domestic/commercial and 9% industrial. Approximately 41% of the average daily flow (ADF) is attributed to infiltration and inflow. The French Broad River WRF is currently permitted for 40 mgd experiencing an ADF of 22 mgd and peak of 65 mgd. The annual facility operating cost for the WRF is approximately $6,000,000.

Treatment Processes
The key treatment processes at the French Broad River facility are as follows:

Preliminary Treatment
- Bar screens (2 units with ¾” spacing) with screenings compactor and shaftless screw conveyer (Infilco vertical climber screens);
- Influent pumps (3 units) with 35 mgd rated capacity each (Goulds – Model MFD 30x30-27125); and
- Aerated grit chambers (3 units) with associated grease removal (Schreiber system).

Primary Treatment
- Primary microscreens (7 units) using 250-micron screens (currently out-of-service; flow through basin only).
- Secondary Treatment (All RBC’s are air-driven Envirex units)
  - First stage RBC (44 units),
  - Second stage RBC (72 units),
  - Third stage RBC (36 units),
- Intermediate pumps (three units) that pump water to clarifier from third stage RBC, and
- Intermediate clarifier (four cells with total volume of 2 MG).

Tertiary Treatment
- Cloth-media disc filters (four basins with four filters per basin – Aqua-Aerobics).

Biosolids Treatment
- Gravity thickeners (two units), 100 foot diameter each;
- 2.5 meter belt presses (two units) (BDP vertical stack units);
- Fluidized bed incinerator (40 dry tons/day rated);
- Alkaline stabilization Facility (40 dry tons/day rated); and
- Anaerobic digesters (two units), 100 foot diameter each (decommissioned).

WRF and Hydroelectric Dam
Disinfection
- Sodium hypochlorite chlorination system and
- Sodium bisulfate dechlorination system.

Further description of these processes is as follows:

Wastewater enters the plant through a 66-inch diameter interceptor and then passes through the bar screen station and into the influent pump station wet well. From there, flow is pumped to the grit and grease removal facility, then flows by gravity through the primary microscreens and flows through the RBC trains where the biological treatment occurs. Flow is then pumped to an intermediate clarifier and then passes by gravity through the cloth media disc filters. Afterwards, disinfection occurs in the hypochlorite facility where sodium hypochlorite replaced gaseous chlorine in 2002. The 8% sodium hypochlorite solution is fed at approximately 1,000 gallons per day. Finally, disinfected water is dechlorinated using sodium bisulfate. Treated water passes through a Parshall flume and is discharged by gravity into the intake flume for a hydro-electric facility, where some of its energy is recovered for power generation (river water is also present in the flume; the intake of which is at the upstream hydro-electric dam).

Plant solids are handled in several ways. Removal of large solids and trash (greater than 1/2”) occurs at the bar screens. Screenings are compacted and conveyed via a shaftless screw conveyer to a dumpster and landfilled. Finer solids (grit and grease) are removed and conveyed to a dumpster and then landfilled. Sludge from the RBCs is de-watered using the gravity thickeners. The slurry is pumped to belt filter presses for further dewatering to an average of 25% solids cake. The cake is then burned in a fluidized bed incinerator, the primary method of biosolids disposal. The ash is removed by a scrubber and then disposed of in a lagoon on the plant property. Alkaline stabilization can be used as a backup to incineration. This process produces ‘Nutrilime,’ which produces a Class A Exceptional Quality (EQ) Biosolid. The Nutrilime can be used for agricultural use, or for soil amendment.

MSDBC operates a highly automated plant, wherein all process trains are completely automated via a PLC-based control system using Ifix software with extensive in-house development.

Expansions and Upgrades
The most recent expansion to the French Broad River facility was in 1989 when the plant capacity was increased from 25 mgd to 40 mgd and the incineration and chemical stabilization for sludge handling were added. There are no current plans for further expansion.
Challenges Overcome

Biosolids Handling Operations
The original solids handling process—thickened sludge in gravity thickener tanks, pumped to gravity belt thickeners across the facility, then pumped again across the facility to anaerobic digesters. After digestion, the sludge was pumped back across the facility (again) to be dewatered with standard belt filter presses. This resulted in high pumping, energy, and polymer costs. The French Broad River WRF staff has since optimized the system by taking the thickened sludge from the gravity thickener tanks and pumping it directly to the belt filter presses. This eliminated the gravity belt thickeners and anaerobic digesters, plus the associated pumping equipment. The results were a significant reduction in polymer use/cost, reduced energy costs, higher BTU-value sludge (which translated into lower supplemental fuel use/cost for the incinerator). The staff also replaced aging belt filter presses and now the dewatering process consistently achieves greater than 24% solids cake with an average polymer use of only 5 lbs/ton.

Laboratory Operations
MSDBC has a unique partnership with a local laboratory testing firm. MSDBC found that its own laboratory facilities were under-utilized and staffing of the lab came at a high cost. The local testing firm was offered the use of the MSDBC laboratory space and in return MSDBC receives all analytical lab work at no cost. This saves MSDBC approximately $60,000 per year in laboratory testing costs.

Personnel

Staff
Personnel at the French Broad River WRF include 11 operations staff and 13 maintenance staff. All operators are North Carolina certified and two staff members are certified maintenance technologists.

Staff Development
In addition to routine personnel development training, MSDBC encourages treatment plant operators to become certified wastewater operators. This certification is accomplished by actively allowing employees paid time to attend coursework, as well as financial incentives for obtaining advanced levels of certification. Ten of the staff are certified Grade IV operators and one is a certified Grade III operator.

The plant also has implemented a skill based pay program for the plant maintenance division wherein employees earn higher salaries based upon becoming proficient in needed skill areas.

Health & Safety
MSDBC places great emphasis on the safety and wellbeing of its employees. The safety program is managed by the Environmental Health and Safety Division (EHS). The EHS ensures compliance with regulatory agencies and functions to reduce losses to MSDBC such as high worker’s compensation premiums, lost production time, and injury to people or property. The EHS promotes awareness of and participation in health and safety programs among all employees. This proactive program has helped to reduce OSHA violations to zero for the prior calendar year, as well as a lost workday case rating 30% less than the previous year per North American industrial classification system.

In addition MSDBC also has a wellness program, which is used to help maintain employees’ health. Various programs are sponsored throughout each year, such as walking programs, healthy lifestyle choices, smoking cessation, etc.

Operations Challenges
MSDBC has participated in the Operations Challenge since 2010:
• First place overall at 2011 North Carolina American Water Works Association and North Carolina Water Environment Association (NC AWWA-WEA) conferences;
• Seventh place overall at the 2012 Water Environment Federation Technical Exhibition and Conference (WEFTEC) in New Orleans (third in Maintenance Category, third in Safety Category);
• First place overall at 2012 NC AWWA-WEA Conference;
• Fifteenth place overall at 2013 WEFTEC in Chicago; and
• Second overall at 2013 NC AWWA-WEA conference.

Awards and Recognition
The French Broad River WRF has received National Association of Clean Water Agencies (NACWA) Peak Performance Awards for five consecutive years at the Gold Level and a Platinum Level award last year. MSDBC also received an AMSA (now NACWA) Excellence in Management Award in 2004 for management of its facilities.
Unique Attributes

Electric Power Generation
MSDBC owns and operates a small hydroelectric dam and generation facility. The original structures were built in the early 1900s and provided electric power for Asheville’s first trolley system. This system was later used to generate commercial power until the 1960s when it was decommissioned. In the mid-1980s the system was rehabilitated and currently generates up to 2.4 megawatts of electricity (depending on river flows) using three turbines. This generation facility helps to offset MSDBC’s electrical power costs, saving approximately $33,000 per month. MSDBC also generates power by using methane from the nearby closed landfill. Gas is piped to the plant where it is used to power two engine-driven generators. These two generators supply approximately 900 kW of power.

ISO Certification
MSDBC’s entire organization is ISO14001 certified. The plant was the first to be certified in 2002. The remaining departments received final certification in 2005.

Collection System Rehab and Infiltration/Inflow (I/I) Control
MSDBC has one of the most aggressive collection system rehabilitation programs in the region. This effort contributes to the reduction of influent flow to the French Broad River WRF. MSDBC rehabilitates at least 50,000 linear feet of wastewater collection pipes each year. This amount represents approximately 1% of its 991 miles of collection system. Collection system rehabilitation projects are prioritized via MSDBC’s pipe rating program which rates pipe segments based on structural condition (via closed circuit television review), customer service requests, sanitary sewer overflows, frequency of in-house monitoring, and potential for impacts to surface waters.

Contact for More Information on the MSD of Buncombe County French Broad River Water Reclamation Facility
Peter Weed, Director of WRF Treatment & Maintenance (peterw@msdbc.org)
Phone: (828) 225-8204

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BENCHMARKING OPERATIONAL PERFORMANCE – What You Can Learn From a Current Review of Your Operational Data ..........38

FINANCIAL MANAGEMENT: The State as a Funding Resource for Green and Traditional Infrastructure Capital Improvements ........................................... 42

RIGHTSIZING The Fixed Component in Your Rate Structure ..........46

THE HORSEPOWER WAR: Managing a Complex Regional Manifold Sewer System with Hydraulic Modeling (Sustainability Feature) .......................................................... 50
Background Information
Over the last decade, many North Carolina utilities invested a large amount of effort into managed competition processes, including performing benchmarking assessments, to determine where their operations have opportunities for improved efficiencies. In today’s economic climate, operational efficiency is more important than ever. Budgets are being slashed and pressures to avoid increasing rates are stronger than ever. By implementing a focused approach and using the 10 attributes of Effective Utility Management (EUM), utilities can develop an informed approach to identifying operational gaps, optimizing operations, and managing operational costs.

The guidance document for EUM was developed by the United States Environmental Protection Agency (US EPA) and six national water and wastewater associations. It promotes operational optimization that:
1) Ensures ongoing, timely, cost-effective, reliable and sustainable performance improvements in all facets of its operations.
2) Minimizes resource use, loss and impacts from day-to-day operations.
3) Maintains awareness of information and operational technology developments to anticipate and support timely adoption of improvements.

This article will reintroduce some of the principles of Effective Utility Management, and then explore some of the details and unexpected outcomes of a benchmarking and operational optimization case study.

Key work items and performance measures to keep track of their cost effectiveness and key performance indicators, and many North Carolina utilities have found valuable ways to leverage benchmarking information. This article presents a compelling case as to why public utilities should continue to develop and review strategic goals, performance measurement tools, perform benchmarking and implement high impact opportunities.

Defining the ‘New Normal’
Local governments and public utilities are facing more pressures on water and sewer rates than ever before. The pressures come in the form of a perfect storm of social and economic conditions and are defining what is referred to as ‘The New Normal.’ Water demands continue to remain depressed as North Carolina is recovering from the loss of high volume industrial water users such as textiles and tobacco. Residential growth has slowed or stalled, and whatever building takes place uses low flow plumbing fixtures, which present much lower demands than historically experienced. With reduced demand for finished water, many utilities are realizing even greater losses in revenue because most local utilities base their sewer bills for residential customers and commercial customers either directly or as a ratio of water consumption. Reduced water demand does translate into some operating cost savings as power and chemical usage diminishes, but can leave a utility with stranded costs and underutilized assets with high debt costs. As a result, local utility systems are still finding themselves with shrinking revenue streams and growing costs for infrastructure rehabilitation and increased regulatory requirements.

Certain asset classes within many of North Carolina's water and sewerage systems are approaching the end of their useful lives and will require significant effort to rehabilitate or replace. Reinvestment in this infrastructure will be the greatest expense that most local utilities face over the next several planning cycles. These increased costs and reduced revenues place local utilities in the precarious position of needing to raise rates. Raising water and sewer rates is never easy, but in these recent economic conditions, proposed rate increases present more challenges than ever. Many local boards have denied the requested increases and sent their utility directors back to the drawing board to propose budget reductions and reduced spending in lieu of increases. This simply serves to further defer maintenance or capital renewal and creates even larger deficits in future years.

Available Resources for North Carolina Utilities
Local utilities do have several tools at their disposal to assist them with planning, budgeting and defending their proposed operational and capital budget processes. The North Carolina School of Government has successfully launched two initiatives that are available to local governments. The North Carolina Benchmarking Project published its first report in 2000 and covered some aspects of water service,
along with many other service areas in local government. Their annual reports containing results are free to participants and can be acquired by anyone, for a small fee, at http://www.sog.unc.edu/programs/permeas. Another tool that most North Carolina utilities have been able to use is the North Carolina School of Government Environmental Finance Center’s Rates Dashboard available for free at http://www.efc.sog.unc.edu/reslib/item/north-carolina-water-and-wastewater-rates-dashboard. This site has easy-to-use interfaces and provides information about rates, assets, debt, and many more financial measures for local utilities. Both of these resources have great value to local governments and utilities for comparing rates and various service levels.

In 2008, the EPA, along with six other collaborating partners, released its 45-page document titled Effective Utility Management - A Primer for Water and Wastewater Utilities. The primer has three specific areas of focus and is designed to assist a public utility in performing an introspective evaluation of critical success factors identified by the 10 Attributes of Effectively Managed Utilities and the Five Keys to Management Success. The primer provides “a framework intended to help utility managers identify and address their most pressing needs through a customized, incremental approach that is relevant to the day-to-day challenges utilities face.”

This article is not intended to discuss all aspects of the primer, and therefore leaves the broader concepts for further review at a later date. This article, however, is intended to highlight the benefits of focused strategic goals, accurate benchmarking, and the application of optimization techniques as it is directly related to operational optimization referenced in the EUM Primer.

Focus on Benchmarking
Merriam Webster’s online dictionary defines the transitive verb ‘benchmarking’ in this way: to study (as a competitor’s product or business practices) in order to improve the performance of one’s own company. The process of operational benchmarking can be further defined as the development of measurements that can be accurately and consistently compared across external organizations. The outcome of a focused benchmarking process can then be used to identify performance or cost gaps for further evaluation. Once gaps are identified, they can be further analyzed for an understanding of which factors explain the differences and discrepancies and what corrective actions or goals in the form of performance improvement measures can be put in place.

There are many factors that could impact the outcome of a benchmarking effort. There are factors that impact costs of service delivery that may or may not be related to a particular utility’s efficiency or performance. Examples of other contributing factors that affect benchmarking outcomes include desired service level, regional labor costs, energy costs, and any other costs not within management’s direct control.

The key to effective and useful benchmarking is to start with a thorough understanding of the operational goals.
and objectives and of the data needed to accurately make cross-jurisdictional comparisons. Initial benchmarking data may result in findings that require subsequent review and research. It is also imperative to have a thorough understanding of the operational goals and the services being benchmarked and to have accurate data sources.

Benchmarking projects may also benefit from an iterative process, such that once optimization opportunities are identified at a programmatic level, additional data research can be performed at a more discreet level until the cause for differences are understood.

Case Study
This case study relates to benchmarking performed for a medium to large size wastewater collection system. This benchmarking case study actually started with a comprehensive CMOM assessment and the development of a six-year Capacity, Management, Operation, and Maintenance (CMOM) Implementation Roadmap. The assessment phase included intensive document review, staff interviews, and data analysis to assess the effectiveness and efficiency of the organization. All aspects of collection system management were considered – from field staff to upper management, and from O&M to engineering to IT. The assessment identified over 300 opportunities for improvement, which were grouped into approximately 50 initiatives to be implemented in priority order over the course of six years. See Figure 1 for an illustration of the roadmap.

There were six key findings that relate to this case study:

- The City’s Standard Service Offer (SSO) rate was in the four to eight SSOs per 100 miles of collection system per year (when counting all releases regardless of volume or whether it reached a water of the state). This rate put them on the EPA radar as an average performer.
- The majority of SSOs were caused by O&M issues (fat, oil and grease (FOG), roots and debris).
- The sewer cleaning and FOG programs would be critical to reduce SSOs to an acceptable level.
- Sewer cleaning crews appeared to be under-producing in terms of miles of cleaning per crew per year.
- A relatively small percentage of the system was being cleaned per year for a system of its age and performance level.
- Management was under intense pressure to reduce budgets.

While the director recognized the strategic importance of reducing SSOs, as well as the need to do more sewer cleaning, he made it clear that he would not be requesting any additional resources until productivity was in line with industry best practices. The questions then became: “If productivity is low, what should it be and how can we get there?”

Enter the benchmarking process. First we identified three high performing cities to benchmark against (each had fewer than two SSOs per 100 miles per year, which was the city’s goal). Second, we designed the data to collect. We asked for number and types of cleaning crews, miles of cleaning per year per crew, percentage of system cleaned per year (unique pipes and ‘with repeats’), age of system, and any sewer cleaning quality assurance/quality control (QA/QC) program results. Each of these pieces of information would play a key role in determining what the city’s goal should be. Third, we collected the data. See Figure 2 for the data that was collected.

Once the data had been collected, it was interpreted. One of the most important findings was related to effective cleaning, which takes the miles cleaned per crew per year and multiplies it by the QA/QC pass rate. This gave an effective mileage of cleaning per crew per year (i.e., only counting the pipe cleanings that actually result in a clean pipe.) The city which had the highest production (over 100 miles per crew per year) also had the lowest percent pass rate for its QA/QC program (around 65%). That gave it an effective cleaning mileage per year of around 70 miles of quality cleaning per year. This was about the same rate as a different city that was producing fewer miles per crew (around 80 miles) but with a 90% pass rate. This convergence was a big factor in determining the city’s sewer cleaning goal.

Before setting a goal, and before sharing the results of the benchmarking, a tabletop exercise was conducted with crews to determine how many ‘set-ups’ could be accomplished during an average day. The number accounted for time to get out of the yard, drive time, breaks, water tank filling, grit dumping, etc., as well as for hard days and easy days. On average, crews estimated that they were accomplishing approximately nine set-ups per day. They were shocked to find that they were only averaging four set-ups per crew per day.

The next question was “What is affecting our productivity?” That is where process benchmarking enters the equation. We then spent time with crews, supervisors, planner/schedulers and managers trying to determine what elements were affecting productivity. A wide range of opportunities were identified, ranging from some management issues such as:

- How their performance goals were set and tracked;

<table>
<thead>
<tr>
<th>Data Point</th>
<th>Low</th>
<th>High</th>
<th>City</th>
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</thead>
<tbody>
<tr>
<td>Miles of sewer cleaning per crew per year</td>
<td>30</td>
<td>110</td>
<td>30</td>
</tr>
<tr>
<td>OC ‘pass rate’ (excluding utilities without formal QC programs)</td>
<td>65%</td>
<td>95%</td>
<td>65%</td>
</tr>
<tr>
<td>Effective cleaning (miles of cleaning per crew x QC pass rate)</td>
<td>19.5</td>
<td>104.5</td>
<td>19.5</td>
</tr>
<tr>
<td>Collection system size (miles)</td>
<td>1400</td>
<td>6500</td>
<td>1400</td>
</tr>
<tr>
<td>System age (average in years)</td>
<td>25</td>
<td>85</td>
<td>85</td>
</tr>
<tr>
<td>Miles of system mileage per crew</td>
<td>100</td>
<td>260</td>
<td>240</td>
</tr>
<tr>
<td>Percentage of system cleaned per year (with repeats)</td>
<td>12%</td>
<td>90%</td>
<td>12%</td>
</tr>
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Figure 2.
• Planning and scheduling issues, such as how the planning/scheduling process accounted for the need for ‘no park’ placards;
• Where the crews had to drive to dump their grits; and
• More than a dozen other opportunities. Each opportunity had its own potential for productivity improvement, along with addressing concerns related to cost and level of effort. It turns out that the number one cause of productivity loss was a management issue. The goal set by management was to accomplish all work orders on schedule – which makes sense. The only problem was that the computerized maintenance management system (CMMS) only produced about half the number of work orders the crews were capable of completing. So their goal was being met but there was no optimal utilization of staff.

The next question was “What should our goal be and how will we get there?” An interim goal of six set-ups per crew per day was set. Because the benchmarking also showed that the city needed to do more cleaning overall (needed to triple the amount of cleaning to get SSOs down to the desired service level of less than two SSOs per hundred miles per year), additional sewer cleaning work was loaded into the CMMS. Now there was more than enough work to keep crews busy throughout the day. They were able to increase their production by 50% (from four to six work orders per day) within six months without implementing any other opportunity apart from changing the goal.

A long-term goal of nine set-ups per crew per day during an eight-hour day with a 90% pass rate goal was established. This resulted in approximately 80 miles per crew per year and 70 effective miles. This level of production will take some time to achieve because there will be some needed capital investments (such as a new grit dumping facility in the southern part of the city), as well as other opportunities relating to attendance and fleet management, that will take some time to design and implement.

Now that the crews are on their way to producing at industry best practice levels for both productivity and quality, the director has approved an action plan as part of the city’s strategic planning process that leads up to the two-year rate package request to the city council later this year. This package request will include additional crews needed to achieve the cleaning of an appropriate portion of the city annually in order to reach the desired SSO service level of less than two per 100 miles per year.

The biggest benefit of the increased cleaning production, as well as other early action initiatives from the roadmap, has been supporting the city’s efforts to reduce SSOs from approximately four to eight per 100 miles per year to approximately two to four over the first three years of the program. This helped city officials negotiate the precedent-setting CMOM portion of their consent decree, which completely preserved their adaptive management style instead of the EPA’s typical prescriptive approach. This alone has saved the city a projected $375 million over the course of the consent decree.

Conclusion
A successful operations optimization process is one that develops and implements a proactive strategy where public employees take a hard look at their operations and systems in order to produce an implementation plan that will enable them to meet accepted industry standards and benchmarks for savings and efficiency, while meeting agreed service levels and performance measures. This process should result in an acceptable operation that can demonstrate a defensible cost of service and provides a benefit to the public.

Utilities that participate in a focused benchmarking process can utilize a range of tools to identify improvement opportunities and develop actionable initiatives to close the gaps. One of these tools is an optimization process, which can be implemented in a continuous improvement environment, consistent with the EUM Primer’s Five Keys to Management Success.

A well-executed system of strategically planned, focused benchmarking, along with operational optimization processes, can provide a utility with a range of tools to defend operational costs, capital programs, support responsible rate setting, and prepare for a sustainable and defensible financial future.

About the Authors
John Evans, PE, is a Civil Engineer who primarily focuses on wastewater collection system initiatives involving operational optimization, SSO reduction, regulatory audit preparation, and negotiation support during enforcement actions. Related practices include: asset management, Operations and Maintenance best practices, Geographic Information Systems, CMMS implementation, data analysis, business process optimization, computer programming, application integration, and mobile data solutions. Evans is HDR's wastewater regulatory support practice lead.

David K. Saunders, PE, is a Senior Consultant for HDR, where he provides utility management consulting services. He also currently serves as the executive director for the Yadkin Pee Dee River Basin Association. Prior to joining HDR, he was utility director for City/County Utility Commission serving the City of Winston-Salem and Forsyth County as well as five additional regional partners.

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Financial Management: The State as a Funding Resource for Green and Traditional Infrastructure Capital Improvements

By Francine Durso, PE, NC Division of Water Infrastructure

The North Carolina Division of Water Infrastructure administers the Federal State Revolving Fund (SRF) loan programs for both clean water and drinking water. Benefits of the SRF program include:

- A stable source of funding,
- Interest rates at ½ market rate or zero percent loans, and
- No interest during construction.

As a utility considers its options for financing wastewater and drinking water projects, North Carolina’s SRF programs are viable funding resources for units of local government by assisting with low-interest or zero percent interest loans for aging infrastructure replacement and rehabilitation.

The Clean Water State Revolving Fund Program

Nearly 30 years ago, Congress amended the Federal Water Pollution Control Act (also known as the Clean Water Act [CWA]) and created the Clean Water State Revolving Fund (CWSRF) to assist states with funding for wastewater treatment facilities, wastewater collection systems, reclaimed water facilities, and energy-efficiency upgrades at wastewater facilities. States use these federal funds to set up infrastructure funding accounts from which financial assistance is provided as low-interest loans and is made available to local government units. These loans are provided at lower than market rates for wastewater infrastructure and assist local government units with financing the cost of infrastructure improvements needed to protect and enhance surface waters. These monies are known as revolving funds because as a local government unit repays the loan, the monies are loaned out repeatedly.

Annually, the federal government allocates funds to each state through the US EPA for the CWSRF program based on percentages in the CWA, which have not been updated since 1987. North Carolina’s allocation is approximately 1.8% of the national appropriation. The North Carolina legislature must provide a 20% match in order to access the federal dollars. The federal funds for North Carolina for Fiscal Year (FY) 2014 are expected to be $25 million. Together, the federal funds and the state have provided over $750 million for investment in North Carolina’s clean water infrastructure since the inception of the program and have enabled nearly $1.5 billion in loan commitments over this period due to the revolving nature of the loan program.

Each year, North Carolina utilizes at least 10% of the United States Environmental Protection Agency (EPA) funds for ‘green projects,’ which are defined as energy efficiency projects at wastewater facilities (including treatment plants and pump stations), reclaimed water projects, stormwater BMPs and stream/wetland/buffer restoration projects. The State currently provides zero percent interest loans for 20 years as an incentive for local government units to pursue these green projects.

The North Carolina CWSRF recently provided zero percent interest loans for the following three wastewater treatment plant (WWTP) energy efficiency projects that are designed to obtain substantial energy savings:

1. Rocky Mount’s Tar River Regional WWTP oxygen generation system replacement,
2. OWASA’s Mason Farm WWTP aeration system replacement, and

Recent Green Projects at Wastewater Treatment Plants

1. Rocky Mount’s Tar River Regional WWTP Oxygen Generation System Replacement

The City of Rocky Mount operates a 21 mgd WWTP that utilized a pure oxygen activated sludge system. The cryogenic oxygen generation plant was installed in 1981 in order to treat high strength industrial wastes and was capable of delivering 50 tons O₂/day to the pure oxygen activated sludge system. The plant’s average daily flow decreased over time and for the period 2007 through 2010, flow was less than half of the plant’s design capacity. However, the cryogenic oxygen plant had no turn-down capability and ran at full capacity during all periods of operation even though less oxygen was required. In addition, the system had exceeded its lifespan and had become a maintenance issue due to the hours of daily operations attention needed, the frequency of repairs, and difficulty in obtaining needed parts.

The City replaced the inefficient system with a new, efficient Vacuum Pressure Swing Adsorption (VPSA) oxygen generation system. The VPSA system installed at Rocky Mount has an oxygen production capacity of a minimum of 26.4 tons O₂/day, which matches more closely the present...
and future oxygen demand at the Tar River Regional WWTP. The system will allow the WWTP to continue its current capacity and level of treatment. In addition to the new VPSA system, the project included a PLC to monitor and automatically control the oxygen generation system. This PLC takes advantage of the turndown ability of the new system and reduces the waste of oxygen, energy, and expense typical of the previous system.

Replacement of the cryogenic oxygen generation plant with the new VPSA oxygen generation system has reduced the annual power consumption associated with oxygen generation by approximately 27%. The project qualified for a zero percent interest CWSRF loan, which was offered in the amount of $2.34 million.

2. Orange Water and Sewer Authority’s Mason Farm WWTP Aeration System Replacement
The Orange Water and Sewer Authority (OWASA) provides water and wastewater services to the Carrboro-Chapel Hill community and operates the 14.5 mgd Mason Farm WWTP in Chapel Hill. The plant utilizes primary clarifiers, activated sludge treatment process with biological phosphorus removal, deep-bed sand filters and ultraviolet light disinfection in its treatment process. The existing activated sludge process utilizes coarse bubble aeration and jet mixing. When OWASA assessed the capability of the existing process to provide treatment for the 20-year projected flow scenarios, it found that the average monthly future energy use would be approximately 823,000 kWh, resulting in costly expenditures for electrical power. The purpose of the project is to replace the inefficient aeration equipment with new and energy-efficient aeration and mixing systems.

The project consists of replacing the existing jet aeration system with fine bubble diffusers and installing new blowers to meet the increased discharge pressure requirements of the new diffusers. New hyperboloid mixers that are more energy efficient than the existing jet mixers will also be installed. The aeration system modifications are projected to reduce energy use associated with aeration and mixing by more than 60% compared to existing equipment and to reduce total electrical use at the WWTP by more than 30%. The project qualified for a zero percent interest CWSRF loan, which was offered in the amount of $6.56 million.

3. Greenville Utilities Commission’s WWTP Ultraviolet Light Disinfection System Replacement
The Greenville Utilities Commission (GUC) operates a 17.5 mgd WWTP that utilizes biological nutrient removal, deep-bed sand filters and ultraviolet light disinfection (UV) treatment processes. Currently, the plant has two medium-pressure high intensity UV systems installed in an open channel configuration downstream of the effluent filters. Relative to low pressure lamps, a medium-pressure lamp allows for a reduced reactor footprint and a reduced lamp count, but annual power costs tend to be higher while lamp life tends to be lower. GUC’s existing UV units were installed sequentially in 1994 and 1996. The 1994 unit operates in one of three energy settings: low, medium, and high. The 1996 unit employs an infinite range of energy settings that are calculated relative to flow and transmissivity of the water.

The existing UV equipment is nearing the end of its useful life and the annual operation and maintenance costs are high and have increased over time. The purpose of the project is to replace the aging, inefficient equipment with new and energy efficient equipment in order to maintain compliance with state regulations, while also reducing energy requirements of the
WWTP. Replacement of the medium pressure high intensity UV units with a low pressure, high intensity UV system will reduce the annual power consumption associated with the UV disinfection system by approximately 80%. Additional savings on the yearly Operation & Maintenance costs will also be realized with the replacement UV system through longer bulb life and readily available parts. The project qualified for a zero percent interest CWSRF loan, which was offered in the amount of $3.36 million.

**The Drinking Water State Revolving Fund Program**

In 1996, Congress amended the Safe Drinking Water Act (SDWA) to create the Drinking Water State Revolving Fund (DWSRF) to provide states with a financing mechanism for ensuring safe drinking water to the public. States use the federal money to set up an infrastructure funding account from which financial assistance, such as loans, is made available to public water systems. The loans assist public water systems with financing the cost of infrastructure improvements needed to protect public health and to achieve/maintain compliance with the SDWA. The loan repayments to North Carolina’s DWSRF are a continuing source of funding for future projects. As a local government unit repays the loan, the monies are loaned out again and again, thereby providing public benefits repeatedly through time.

Each year, the federal government allocates funds to North Carolina through the EPA for the DWSRF program based on the results of a national Drinking Water Needs Survey. North Carolina receives 2.3% of the national appropriation based on the 2010 Needs Survey. The state must provide a 20% match to obtain the federal funds. Together, the federal funds and the state match have provided over $340 million for investment in North Carolina’s drinking water infrastructure since the inception of the program and have enabled nearly $445 million in loan commitments over this period due to the revolving nature of the loan program. Congress requires that 20 to 30% of the federal funds be used to provide additional subsidization, and 15% must be loaned to systems serving fewer than 10,000 people.

**About the Author**

Francine Durso is a registered Professional Engineer in North Carolina and South Carolina, and holds a BS in Civil Engineering and a MS degree in Civil Engineering from North Carolina State University. She has more than 30 years of experience in the field of water resources management and in the planning and design of water and wastewater treatment facilities. She worked for over 20 years in private engineering consulting practice, and joined the state of North Carolina in 2012 as a Project Manager in the Division of Water Infrastructure.

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Rightsizing the Fixed Component in Your Rate Structure

By Elaine Vastis Conti, Manager, Raftelis Financial Consultants, Inc.

Competing pricing objectives often challenge the fixed component of your utility’s rate structure. On one hand, your utility wants stable revenues to ensure water and sewer rates can cover annual operating and capital expenses. But on the other hand, you want rates to be affordable for those customers who use water efficiently. So, what is the right fixed component for your utility? The answer is “it depends.” This article provides the principles and concepts that will help guide your utility’s process for determining the right size for the fixed component of your rate structure.

What costs can you recover from the fixed component in your rate structure?

Industry guidelines (for example Principles of Water Rates, Fees, and Charges Manual of Water Practices M-1 (Sixth Edition)) allow a utility to recover three types of cost categories from the fixed component. The first cost component includes the recovery of administrative costs, such as those associated with billing, meter reading, and customer service. Typically, the unit cost for the administrative component should be the same for all customers regardless of meter size or location since it does not cost the utility more to bill, read, or answer questions for a customer with one meter size versus another. The second recoverable cost category is meter costs, such as those associated with maintenance, testing, and replacement. The third cost category that can be recovered from the base charge is termed ‘readiness-to-serve’ and can include a portion of debt service or fixed operating expenses, and can be scaled by meter size.

The sum of the three cost categories represents the maximum cost-justified amount that a utility can recover from its fixed component. However, a utility can charge less than the maximum cost-justified amount to be consistent with its top pricing objectives or policies, which may dictate lower fixed charges.

How can you assess your fixed component?

Utilities can recover the fixed component of their rate structure through various rate structures. Let us compare two common rate structures: a fixed base charge and a minimum charge. In Exhibit 1, the blue line marked base charge depicts the cost that a customer with a 5/8-inch meter would pay. The line shows the customer would pay $5.25 per month regardless of the amount of water used. Any amount of water used would be charged at $2.95 per thousand gallons (kgal).

Another common method is to assess the fixed cost component through a fixed amount that includes a certain amount of usage, which can also vary by meter size. This rate structure is referred to as a minimum charge. In Exhibit 1, the red line marked minimum charge shows a customer with a 5/8-inch meter would be charged $12.10 for water use up to 3,000 gallons of water. This example assumes any use above 3,000 gallons is assessed a rate of $2.95 per kgal. As shown in the exhibit, if a minimum charge is assessed but customers only use 2,000 gallons in that month, customers will still pay $12.10, as if they used 3,000 gallons. In other words, a reduction in use below 3,000 gallons would not result in a lower customer bill as it would for a rate structure that assesses a fixed base charge and a rate per water use. In the example provided in Exhibit 1, customers who are not assessed a minimum charge and who use 3,000 gallons would pay $14.10, but if these customers reduced their usage to 2,000, they would pay $11.15. The utility with the minimum charge rate structure would collect $12.10 regardless of use at or below 3,000 gallons, allowing the utility to generate more stable revenues from its fixed charge component.

The potentially negative aspect of a minimum charge structure is that it does not encourage conservation for water use.

How does your utility’s fixed charge compare to others?

Utilities often want to
compare their rates and charges with those of other utilities. Evaluating monthly bills can be an effective tool for comparing your utility’s bills against others. This evaluation is also useful for communicating with elected officials, such as boards or commissions, and your customers. However, monthly bills assessed by utilities vary significantly due to location, differences in the number of customers served, regulatory issues/costs, service area density, availability of grants as funding options, rate setting pricing objectives, rate structures, and other site specific factors. Exhibit 2 compiles data regarding base charges from the 2012 Water and Wastewater Rate Survey co-produced by the American Water Works Association (AWWA) and Raftelis Financial Consultants, Inc. (RFC), and from the Water and Wastewater Rates and Rate Structures survey co-produced by the Environmental Finance Center (EFC) and the North Carolina League of Municipalities. The AWWA/RFC survey information represents data from utilities across the nation that range in size and location. The EFC/NC League of Municipalities survey contains data from utilities located across the state of North Carolina. Since the utilities that participate in the EFC/NC League of Municipalities survey are mostly smaller than those in the AWWA/RFC survey, the median monthly fixed/minimum charges between the two surveys differs significantly. Smaller utilities have to invest in the capital assets required to provide water service, but have a smaller number of customers from which these costs can be recovered. Therefore, smaller utilities typically have higher fixed charges (and are more likely to have minimum charges with usage allowances) than larger utilities that have more customers from whom to recover costs.

What’s right for Your Utility? Before a utility tries to calculate or revise its base/minimum charge, it should first determine its top rate-setting pricing objectives. Rate setting pricing objectives are used to drive the rate setting process. For example, rate-setting pricing objectives can include, but are not limited to: conservation/demand management, affordability, revenue stability, ease of implementation, financial sufficiency, and other goals.

Exhibit 2: Base/Minimum Charge Benchmarking Data

<table>
<thead>
<tr>
<th></th>
<th>AWWA/RFC National Survey¹</th>
<th>EFC/NC League of Municipalities North Carolina Survey²</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Water</td>
<td>Wastewater</td>
</tr>
<tr>
<td>Median Fixed/Minimum Monthly Charge</td>
<td>$8.69</td>
<td>$9.85</td>
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<tr>
<td>Usage allowance in minimum charge</td>
<td>2,531 gallons (survey average)</td>
<td>2,517 gallons (survey average)</td>
</tr>
<tr>
<td>Utilities in survey that included minimum allowance</td>
<td>23%</td>
<td>23%</td>
</tr>
<tr>
<td>Number of utilities participating in survey</td>
<td>288</td>
<td>157</td>
</tr>
</tbody>
</table>

¹ 2012 Water and Wastewater Rate Survey co-produced by the American Water Works Association and Raftelis Financial Consultants, Inc.
² Water and Wastewater Rates and Rate Structures in North Carolina; February 2014; Environmental Finance Center and North Carolina League of Municipalities.

As an example, consider Utility A that currently has a fixed charge that is assessed monthly and assume Utility A’s management team (including board/commission) has identified the following top rate setting pricing objectives for its rate structure: affordability, conservation and revenue stability. The affordability and the conservation pricing objectives would cause downward pressure on the fixed charges, whereas the revenue stability pricing objective would cause upward pressure on the base charge. So how does a utility determine the right course of action and balance these competing objectives? It can only do this by understanding its customer characteristics and knowing the prevalence or lack of affordability issues in its service area, the amount of non-essential water use that can be targeted for conservation, and the variability in revenues resulting from changes in demand. Knowledge of these factors, and others, allow the utility to evaluate the impact of various base and volumetric rates on customers and revenues.

As shown in Exhibit 3, establishing a balance for the right base charge for a utility is challenging. The right base charge is established when a utility identifies its rate-setting pricing objectives, uses demographics and usage characteristics to calculate various base and volumetric charges, determines the impact on customers and revenues, and then chooses the rate structure that balances these competing objectives.

About the Author:
Elaine Vastis Conti is a manager at Raftelis Financial Consultants, Inc. She has worked with numerous utilities in North Carolina and across the country over the past 14 years and is currently the chair of the North Carolina AWWA-WEA Utility Management Committee. Ms. Conti has an MBA from Wake Forest University.
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<td>Self Priming pumps</td>
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<td>Lakeside Equipment</td>
<td>Screw Pumps</td>
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**VALVES / GATES**

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<td>Hydro Gate</td>
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**SCADA / CONTROLS / VFDs**

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**SCARIFICATION**

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**INSTRUMENTATION**

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**FILTERS**

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**DISINFECTION**

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<td>Water Equipment</td>
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  - Telodyne Isco
  - Sample and Open Channel Flow

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  - Alum. Geodesic Domes and Flat Covers
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- **John Whittaker**: (704) 909-8810 (m) whit@clearwaterinc.net (west)
The Horsepower War: Managing a Complex Regional Manifold Sewer System with Hydraulic Modeling

By T. Carter Hubard, PE, Water & Wastewater Services Program Manager and James R. Michel, PE, Water & Wastewater Services Project Engineer, W.K. Dickson & Co., Inc.

Introduction and Background

“Every time the commerce pump station runs, this pump station won’t run, not even 1 gallon per minute!” exclaimed the Brunswick Regional Water and Sewer collection system operator. The operator was referring to a dead head condition that prevented the Lincoln School Road pump station from overcoming the manifold regional sewer system’s pressure and discharging its liquid. The operator, who was responsible for reporting sanitary sewer overflows, wanted the pump station to operate no matter the regional sewer system’s condition.

To understand the tug-of-war that plagued the regional sewer system, one first has to appreciate how it came to be. The Brunswick County Regional Sewer System, formed in 2000, has a 169 square mile service area located within of Brunswick County and serves four municipalities and a sewer district. Brunswick County owns the regional system, and the Town of Leland, Town of Navassa, City of Northwest, and Brunswick Regional Water and Sewer District are participants in the system. In the 1980s, this historically agricultural area saw small wastewater package plants spring up to provide wastewater treatment for commercial development and an industrial park. The area's prime location, just across the Cape Fear River from Wilmington, soon caught the attention of real estate developers. After the Magnolia Greens residential and commercial development installed 5.5 miles of 10-inch force main to the County wastewater treatment plant (WWTP), a manifold sewer system was envisioned as a possible solution for adjoining developments. In 1999, the neighboring sewer providers developed plans for sewer collection systems and a regional WWTP to handle the growing sewer needs. This partnership envisioned a regional sewer system that would eliminate the problematic wastewater package plants and failing septic tanks, expand the collection systems, and encourage growth.

Problems with System Flow

As intended, the availability of sewer enabled commercial and residential growth in the area, but more rapidly than expected. The population of the area swelled by 395% from 2000 to 2010. Three of the municipalities in the service area, Leland, Navassa, and Belville, were three of the fastest growing municipalities in North Carolina from 2000 to 2009. The population of Brunswick County, as a whole, grew 46%.

Hydraulic modeling identified prioritized, phased capital improvements to improve system operation and ensure long term capacity. The Clarmont Pump Station upgrade included replacing pumps, variable frequency drives, wetwell, and flow meters.

With growth came growing pains. The original manifold sewer system force mains are used as a trunk main into which smaller force mains are connected. The energy exerted into the manifold system by multiple pumping systems generates pressure in the entire system. Six regional pump stations and 65,000 linear feet of force main connect the participant’s collection systems and deliver wastewater to the Northeast Regional WWTP. While most of the pump stations connected to the system are owned by Brunswick County and are managed as a regional system, there are also other participant-owned pump stations connected to the regional system.

As the exasperated Brunswick Regional Water and Sewer operator claimed, “When
someone else’s pump station comes on, mine stops!” Was this a maintenance issue or a systematic problem? The existing pump stations were experiencing decreased pumping capabilities when the larger pump stations operated. The multiple pump systems connected to a manifold system had a cumulative effect on the pressure in the system. As a result, during peak events or even during daily operation, some of the pump stations were experiencing a dead head condition. The operators wanted the ability to pump no matter what was happening in the system. Unfortunately, the larger horsepower pumps in the system overpowered the smaller pump stations’ capabilities to pump. So the common approach became increasing pump horsepower to overcome the system head. However, each time a pump size was increased, the system head increased and affected the other pump stations. It became a vicious cycle.

**Developing a System Model**

To resolve this horsepower war, the North Carolina Department of Environment and Natural Resources put the responsibility of capacity management on Brunswick County. In February 2011, an update to the sewer model was recommended to better manage the system. WK Dickson was hired to conduct a wastewater transmission study to evaluate the existing wastewater system and provide recommendations to meet future flow demands. The capacity and capabilities of the existing transmission system were evaluated using sanitary sewer software, and incorporating actual sewer flows and empirical peaking factors. Flow projections for five, 10, and 20-year periods for each of the participants were evaluated by extended period hydraulic modeling to determine recommended alternatives for capacity upgrades.

The characterization of the system started with data research and quantifying the actual existing wastewater flows and permitted flows to characterize the flow volumes for each of the regional participants. The record drawings and tax parcel data were used to create an overall system map with delineated sewer basins draining to the regional system. This resulted in a comprehensive system model that allowed Brunswick County to visualize and understand the interconnectivity of its system with its partners’ systems.

The sewer basin characteristics were used to determine the diurnal pattern and peak flow. GIS information was used to establish the service area of each of the regional pump stations. Flow meter data from the regional pump stations was used to establish flow characteristics of each service area. Diurnal curves were developed and peaking factors were derived from flow meter readings at the pump stations. Brunswick County’s standard design parameters were to include a maximum pressure of 100 psi and a maximum velocity of 6 ft/s. The peak flows were determined by a basin-specific diurnal pattern and a peaking factor.

Each of the regional participants provided sewer flow projections by sewer sub-basin for the time periods of five, 10, 15, and 20 years. These combined flow projections indicated that sewer flows at the Northeast Brunswick Regional WWTP would reach 2.475 million gallons per day (mgd) by the year 2021 and 4.975 mgd by the year 2036.

Multiple scenarios were considered to satisfy the design parameters and conditions required by the participants, as well as to accommodate the projected large flow volumes from the Commerce, Brunswick Forest, and Belville sub-basins. The scenarios considered included upgrades to individual pump stations, flow equalization components, various interconnections of participant force mains, and conversion of an existing 8-inch reuse force main to a sewer transmission main.

**Results and Long Term Benefits**

The hydraulic modeling enabled the analysis of the existing system by running multiple scenarios of alternatives such as additional regional pump stations, variable frequency drives to manage pump station flow and pressure, various force main sizes, and combinations of rerouting flow. This analysis provided a priority-based, phased approach to identify initial capital projects that would have the greatest return on investment. Hydraulic analysis indicated that the existing system was adequate for current average daily flows. However, peak flows and anticipated future flows caused capacity issues. Components in the system needed immediate improvements to meet peak flows and near term flow projections. Alternatives were defined and upgrades planned in two phases with a timeline of upgrade completion. Peak flows in the system exceeded the capacity of two of the six regional pump stations (Clairmont pump station and Lincoln School Road pump station). This was validated by comparing peak events where field personnel had to manually control the operation of several of the pump stations to avoid sanitary sewer overflows.

The Clairmont Pump Station variable frequency drives manage initial and future flows, allowing the system to operate efficiently regardless of flows at other stations.

Parallel 18-inch ductile iron force main constructed by directional drill provides additional capacity for system growth.
The use of extended period modeling provided the necessary information to prioritize the improvements. Alternatives were evaluated and multiple modeling iterations were run to determine how to best maximize the existing infrastructure. The delineation and characterization of the flows was useful to the analysis and allowed the participants to better understand the flow characteristics and operational challenges of the manifold sewer system. The sewer basin diurnal flow patterns varied significantly. The model was very sensitive to the peak flow and diurnal pattern, so the empirical data provided more accuracy than the published diurnal patterns for residential and commercial sewer flow.

Two capital improvement projects were identified that will enable the system to meet the flow expectation of the 2.475 mgd Phase I flow projection. These improvements included the upgrade of the Clairmont and Commerce pump station pumps and 11,150 linear feet of new force main. Additional upgrades to accommodate the future 4.975 mgd flow include an 18-inch parallel force main from Navassa Road to the WWTP as well as a 16-inch force main from Lincoln School Road to the WWTP.

As a result of the study, the Brunswick County Regional Sewer System was able to end the horsepower war in the manifold sewer system, while all participants gained a better understanding of their needs, and how the components worked together as a whole. As summarized by John Nichols, PE, CPESC, the Brunswick County Assistant Director of Public Utilities: “One of the greatest benefits of the modeling analysis was the ability to simulate multiple scenarios in order to find cost-effective solutions that could be phased in at the proper time. One of the greatest challenges of a utility manager is to determine the proper timing of infrastructure improvements, especially when multiple participants are involved and resources are limited. Not having wastewater transmission and treatment capacity available when needed is unacceptable, but having excess capacity sitting idle for long periods of time is not an effective use of capital resources and needlessly increases operation and maintenance expenses. The use of extended period simulations gave Brunswick County and the participants in the Regional Sewer System logical construction phases, along with ‘trigger’ criteria that ensures infrastructure is completed when required, but without putting undue debt service obligations on each utility’s customer base.”

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what will be our best event yet. And make THE water quality event YOUR water quality event.
When most people consider utility management best practices, their focus is on performance excellence in areas like fiscal policy, asset management, training and development of staff, and achieving results for customers. All of these functions are essential to our industry. However, it is easy to overlook what I believe is one of the most underutilized strategies in utility management—relationships matter. Regardless of how innovative or well-planned utility management strategies are, without strong relationships supporting them, success can be an elusive target.

In my tenure with the City of Greensboro, the process of building relationships has guided my approach to utility management and leadership. This philosophy has helped our part of the organization adapt to change, improve performance, and build a team of people and infrastructure that will serve the City of Greensboro for decades to come.

Leading Change

Budgetary pressure is without question the single biggest challenge utility managers face. We are asked to cut expenses, operate with fewer personnel, make infrastructure last longer, and deliver superior service to our customers and community stakeholders. For many leaders in our industry, change can be threatening and demoralizing. The truth is that change also presents opportunity for strengthening relationships and innovation.

Shrinking budgets and operational necessity led our division, and others, to reconsider the way we contract for services. In many organizations, a serious disconnect exists between end-users of services and procurement groups. I have certainly experienced this many times in my career. Maintenance services contracted by our typical low-bid processes were simply not delivering what we needed to maintain our facilities and support our infrastructure needs. As economic pressures grew, the performance gap could not be ignored.

Relationships were the key to procuring necessary stock items and service contracts that raised the bar for experience requirements and performance. We had to open the lines of communication with our procurement and engineering professionals to establish a mutual trust and respect. After establishing relationships with our procurement officials and others, we determined that we did not fully comprehend procurement policies, laws, and processes. Like it or not, many of the policies that we perceived as inflexibly bureaucratic were in place for very good reasons. Likewise, other groups in our organization have gained a greater appreciation and understanding of the requirements of managing wastewater treatment facilities.

Getting Results

Two significant contracting changes were implemented from our collaboration. First, contract pre-qualifications and specifications were tightened to ensure that only qualified contractors are hired by the city. Second, on-call contracts have been executed for maintenance services including coatings, electrical, and mechanical services. These contracting changes allowed our division to receive higher-quality services more quickly, sustain our infrastructure in a more cost-effective way, and reduce the burden of contract administration.

Operationally, on-call contracts allowed us to obtain high-quality maintenance services in a matter of days to weeks, rather than multiple months. In the past, when these services were awarded using the same methods as construction contracts, it often took six months to get maintenance service providers on site. Our maintenance planning cycle was greatly simplified as we received qualified and responsive service providers. Finally, on-call contracts reduced the contract administrative burden for our employees, allowing them to be more productive.

Leaving a Legacy

As a utility manager, I want my legacy to extend beyond simply being a good steward of resources and infrastructure. For me, this means mentoring and investing in the next generation of leaders in our industry. For example, as we prepare to implement $80 million in upgrades to our facilities, we have provided key staff members with many
opportunities to observe equipment, gain knowledge, and benchmark industry standards for operations best practices. As we make decisions that will influence our operations for years to come, it is important to allow team members to formulate and buy into the future.

Relationship building can also be as simple as putting on the apron and grilling hamburgers and steaks with your team. Serving your staff (management by menu) is a great way to establish a positive culture and celebrate success. Avoid underestimating the power relationships can have in moving your organization forward – the influence they have will far outlast the infrastructure we maintain.

Relationships Matter
Budgets and aging infrastructure are challenging utility managers in unprecedented ways. As our industry seeks new approaches to accomplish more with less, building internal and external relationships can help us embrace change and innovation. It is imperative that we look beyond our organization, division, or unit. Alliances with external partners like procurement, engineering, and legal can help you reach goals in unexpected ways. Finally, establish strong relationships within your team and groom the next generation of leaders to understand that relationships matter.

About the Author:
Don Howard has served as water reclamation manager for the City of Greensboro since January 2005. He has a total of 30+ years’ experience in wastewater operations, maintenance, and management. Don holds bachelor’s and master’s degrees in environmental engineering from Kennedy Western University, and wastewater operator certifications in North Carolina and Pennsylvania.

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Standing at the sink brushing my teeth, I suddenly remembered the water was not safe to drink. With a mouth full of foam, I went back into my hotel room, looking for a water bottle, annoyed at such inconvenience. Then I stopped and reflected that this was precisely the reason the seven members of Climb for Water were in Quito, Ecuador. In the US, most of us don’t need to think twice about the safety of the water that comes from our taps. In Ecuador, and many other places around the world, potable water is not taken for granted. Climb for Water wants to help change that.

Soon after returning from Pikes Peak, the team weighed out various ideas and options for future trips and decided on a goal that would both challenge the team and highlight a country served by Water For People: the Ecuadorian volcano Cotopaxi. Cotopaxi is one of the highest active volcanoes in the world and stands 19,347 feet above sea level. Summitted by only 25% of the climbers who attempt it, Cotopaxi would require months of preparation. The logistical challenges of organizing such a trip are formidable. Each climber had schedules to rearrange, flights to book, and specialized gear to purchase, test, and often return. The physical challenge demanded long hours of training for each participant. Although each climber approached training differently, there is no substitute for sweat and hard work. Weekend hikes were routinely scheduled, with emphasis on distance and elevation gain.

The team (Figure 1) consisted of Kraig Kern (W.K. Dickson), Adrianne Coombes (McKim & Creed), Jeff Thompson (Withers and Ravenel), Lisa Edwards (NC DENR), Matt Wilson (Eagle Engineering), Meredith Sullivan (PipeView Technologies) and Paul Judge (NC DENR). We arrived in Quito, Ecuador, in mid-January to start acclimating in preparation for climbing Cotopaxi. At 9300 feet, Quito is higher than many of the mountains in the US.
(North Carolina’s Mount Mitchell is 6,684 feet) and the effects of altitude could be felt immediately. As fit as we were, it was easy to get out of breath just walking through the city, and our third floor hotel rooms were grudgingly accepted (with no elevators, lugging nearly 100 pounds of gear at high elevations was challenging). Proper acclimatization is essential when preparing for high altitude climbs and can take several days. In general, one wants to ascend slowly, going progressively higher each day, while descending at night to sleep. Our itinerary called for seven days of hiking and climbing, increasing altitude as the week progressed.

Altitude sickness is always a concern when traveling above 8,000 feet. In Quito, the amount of oxygen in each breath is only about 72% of that in the same breath at sea level. At 15,000 feet that drops to 58% and at the summit of Cotopaxi, 19,347 feet, there is only 49% of the amount of oxygen in each breath. Symptoms of altitude sickness can range from a mild headache and weariness to a life-threatening build-up of fluid in the lungs or brain at high altitudes. The team closely monitored their blood-oxygen levels with a portable pulse oximeter and reported experiencing various levels of these issues as the week progressed.

As we trained throughout the week, the team traveled to different locations in Ecuador, witnessing the local conditions and culture (Figures 2, 3). No matter where we went, we were impressed and often humbled by the people we met and the conditions we witnessed. Starting from the capital city of Quito, we crossed north of the equator entering the Mindo region, home of Ecuador’s cloud forest, one of the most biologically diverse ecoregions in the world. As we hiked, our guide pointed out that the area was home to over 1,500 species of birds. In particular, we found the hummingbirds amazing and much larger than in the US.

We then made our way up to the highlands of Imbabura Province. The challenge of hiking Cuicocaha with the increased elevation rewarded us with stunning views of the crystal blue lake located inside the crater of the 10,650-foot volcano (Figure 4). The natural beauty of Ecuador continued to amaze us as we crossed back over the equator and traveled south through changing ecosystems to Tambopaxi in Cotopaxi National Park. In each environment we witnessed proud citizens making do with seemingly little resources.

From our base at Tambopaxi at 12,350 feet, we continued to increase our elevation training on the flanks of Ruminahui. For some, the effects of high altitude were apparent. The steep hiking through shoulder-high thorny brush was an exhausting but visually rewarding experience. The Andean paramo (alpine tundra) is a spectacular landscape that can both inspire and humble a climber (Figure 5). The raw beauty of these alpine meadows and images of jagged peaks remain in our minds long after the aches and pains have been forgotten. Unfortunately, the exotic plants and wild horses we saw could only be fully appreciated during our short, infrequent rest breaks. The long hours of acclimatization hikes through challenging terrain were grueling, but would seem insignificant compared to the ascent of Cotopaxi in the coming days.

On summit day, the team mainly rested and prepared their gear and minds for the climb. For safety reasons, glaciated mountains are generally climbed at night to minimize ever-present risks such as avalanche and falling rocks or blocks of ice. Several
of the team took a short hike to keep their muscles warm and stretched. The meals that day were high in carbohydrates to help provide the energy that would be needed for the taxing climb. Late in the afternoon, our guides arrived and discussed the route. The rope teams were determined and final gear checks were performed. One climber carried a satellite tracking device that allowed family and friends to track the location of the team. We all went to bed early, although sleeping proved difficult as the adrenaline was already flowing. The team left our base at Tambopaxi around 10 pm and began the ascent.

We set out in the dark, hiking first in volcanic ash. It is similar to walking uphill in the sand at the beach, except you are in freezing temperatures, wearing heavy mountaineering boots, carrying equipment, and are at extremely high altitude which makes it difficult to breath. When the team reached the glacier, they strapped on crampons and roped up in teams (Figure 6). Throughout the night, for various reasons, some climbers were unable to continue and had to descend. Although they did not reach the summit, many personal bests were achieved. Soon after sunrise on January 25, two of the seven, Jeff Thompson and Meredith Sullivan, stood at the top of Cotopaxi setting a new high of 19,347 feet above sea level (Figure 7).

Their success is remarkable and shared with the entire team and supporters.

Ultimately, Climb for Water’s mission to bring awareness to Water For People was accomplished. The trip is documented with pictures and videos on the group’s Facebook page. One entry received over 3,000 views, showing the great support the team received! The trip to Ecuador was billed as a farewell climb, but rumor has it some members of the team are eager to return for a second attempt.

In all, the 2014 Climb for Water team raised over $10,000 directly benefiting the efforts of Water For People. Since the inception of Climb for Water in 2011, Kraig Kern and the three expeditions have netted over $45,000 in donations. Climb for Water was featured in NC Currents in the Summer 2013 Outreach edition (NC Currents, Summer 2013, pp. 34-36). “Climbing mountains serves as an effective metaphor to the struggle to reach everyone,” Kraig writes referring to clean water. Like each step on the mountain, the 2014 Climb for Water team brings Water For People a little closer to its goal of a world where no one suffers or dies from a water or sanitation related disease.

About the Authors:
Paul Judge is a Hydrogeologist and has worked for the North Carolina Department of Environment and Natural Resources (NC DENR) for 19 years. He is currently serving on the executive committee for NC Water For People. This was his second climb with Climb for Water.

Lisa Edwards has been with NC DENR for 25 years. She is the current chair of Water For People and has participated on six World Water Corps® assignments to Malawi, India and Bolivia. This was her first climb.
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Questions provided by the NC AWWA-WEA Wastewater Board of Education & Examiners.

1. A __________ is the instrument of choice in determining when carbon fines are passing through the media bed and effluent screens of an adsorbing reactor.
   a) Nessler tube/meter   b) pH meter
   c) Turbidimeter   d) Colorimeter

2. The symbol “W” in the National Fire Protection Association warning label means:
   a) You know how to use your multimeter.
   b) You know the hazards and recognize your limitation.
   c) Discuss the job with your supervisor.
   d) Your work environment is dry.

3. What is the surface area of a rectangular settling basin that is 40 feet long and 15 feet wide?
   a) 300 cu ft.   b) 300 sq ft.
   c) 60 cu ft.   d) 600 sq ft.

4. How many milliamps are equal to 2.5 amps?
   a) 250   b) 25
   c) .25   d) 2,500

Answers:
4. d) \( \left( \frac{2.50 \text{ Amp}}{1 \text{ Amp}} \right) \times \left( \frac{1000 \text{ mA}}{1 \text{ Amp}} \right) = 2,500 \text{ mA} \)

MAINTENANCE TECHNOLOGIST QUESTIONS

Questions provided by the NC AWWA-WEA Plant Operations & Maintenance Committee.

1. What condition must be checked for before a shaft alignment is performed?
   a) Electrical current   b) Parallel alignment
   c) Soft foot   d) Angular alignment

2. When working with electricity it is important that:
   a) You know how to use your multimeter.
   b) You know the hazards and recognize your limitation.
   c) Discuss the job with your supervisor.
   d) Your work environment is dry.

3. What is the surface area of a rectangular settling basin that is 40 feet long and 15 feet wide?
   a) 300 cu ft.   b) 300 sq ft.
   c) 60 cu ft.   d) 600 sq ft.

4. How many milliamps are equal to 2.5 amps?
   a) 250   b) 25
   c) .25   d) 2,500

Answers:
1. c) Source: Industrial Maintenance, page 328.
2. b) Ops of WW Treatment Plants, chapter 15.2
4. d) \( \left( \frac{2.50 \text{ Amp}}{1 \text{ Amp}} \right) \times \left( \frac{1000 \text{ mA}}{1 \text{ Amp}} \right) = 2,500 \text{ mA} \)
WATER CERTIFICATION QUESTIONS

Questions provided by the NC AWWA-WEA Water Board of Education & Examiners.

1. Under certain circumstances, a pump can pull water so hard that some of the water turns to small bubbles of vapor. This is called ____________.
   a) pump head
   b) cavitation
   c) water hammer
   d) pump loss

2. The rod used to open and close a valve is called the ___________.
   a) valve key
   b) upper valve plate
   c) valve box
   d) valve stem

3. The condition that exists when the source of water supply is below the centerline of the pump is called ____________.
   a) suction lift
   b) head lift
   c) water head
   d) siphoning

Answers
1. b)
2. d)
3. a)

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This section serves as a forum for operations and maintenance workers to seek answers and solutions to problems and challenges through the insights and experiences of fellow operations-maintenance experts and professionals. Operations-maintenance workers and professionals are welcome to submit their questions anonymously to the forum at nbanks@ncsafeWater.org.

**Question:** I have high flows in my plant and my blankets are rising by the hour. What is the first step in trying to reduce blanket levels? How long is too long to keep air off, if it gets to that point?

**Answer:** Hydraulic overload is very common during rainy seasons and can cause a tremendous burden on the secondary clarifiers. Here are some suggestions:

The best and first way to deal with high flows is to prepare for high flows. This includes maintaining as low a mixed liquor suspended solids (MLSS) as possible for proper treatment. Many plants build and maintain high MLSS for one of two reasons: 1) they believe the high MLSS will aid in proper treatment or 2) they are limited in the amount of solids they can process. An example of this is when plants store solids because they are unable to land-apply due to wet or cold weather. High MLSS and older sludge will cause poor settling, and if the plant experiences high flows because of wet weather, much of these solids will come out of the clarifier, plug downstream filters, and end up in the receiving stream.

If the settling test shows good settling and solids loss is still occurring, then shutting down the air in the aeration basin can be used to avoid losing solids over the secondary effluent weir. If possible, only shut down aerators that are near the effluent end of the aeration basin. This will allow solids to accumulate in the aeration basin and decrease the solids loading on the secondary clarifier.

Keep in mind that, while this may not be a solution that will provide the best treatment, it can be an important short-term answer. Shutting off the air can be a choice between poor treatment for a couple of hours (or even a whole day) or treatment problems several weeks after the event.

**Answered by:** Wade Shaw, Facility Manager / SCWWTP, City of Raleigh / PUD

**Question:** What is the difference between MLSS and total solids? Are the numbers the same? What test is better to run for process control?

**Answer:** The MLSS measures the amount of suspended solids or solids that will filter out. Total solids is the measure of the dissolved solids (those that will pass through a filter) and suspended solids. That said, total solids are higher in concentration than suspended solids. Under aeration, the ‘bugs’ will break down suspended solids and biochemical oxygen demand (BOD) as part of their life cycle. When thinking of solids in terms of process control, MLSS is a better representation of the concentration of ‘bugs’ in aeration and the solids that they will break down in their biological process. The MLSS test is also quicker than the total solids test, which can be helpful when trying to use those numbers for process control. Typically, the target MLSS for a conventional plant should be 2000-4000 mg/L. It would be higher for an extended aeration plant, 3000-5000 mg/L.

**Answered by:** Amy Moore, Wastewater Grade IV, Lab Supervisor, Utley Creek Water Reclamation Facility, Holly Springs NC

**Question:** I work at a small package plant. Our return sludge is very thin and we cannot seem to get it thicker no matter what we try. We are using geyser pumps. Is there another pump or way to thicken up sludge? Our blankets and effluent quality are suffering.

**Answer:** Several questions come to my mind in trying to answer this question. What is your MLSS concentration and settleability? In what ways is your effluent quality suffering? Are there BOD and total
The Operator’s Tailgate

suspended solids (TSS) in the effluent? My initial instinct is to say that you might be wasting too much and that is why your return activated sludge (RAS) seems thin. Do you seem to have a lot of grease in your plant? Do you have a circular or rectangular clarifier? If it is rectangular, you may need to brush the clarifier bottom and sides to remove old solids that may have built up in the clarifier and are affecting your blankets.

Answered by: Terry Foster, Wastewater Grade IV, Chief Operator, Utley Creek Water Reclamation Facility, Holly Springs NC

NC AWWA-WEA operations-maintenance experts and professionals reserve the right to determine the eligibility and suitability of each submission. Submissions that violate NC AWWA-WEA bylaws or policies will not be published or answered. NC AWWA-WEA reserves the right to edit the content of each submission, publish the submission, and/or refuse any submission at NC AWWA-WEA’s discretion.
The 13th Annual Spring Conference was held April 6-8, 2014 and attracted 407 attendees from across North Carolina. As the tagline *Spring Into Operation* suggests, one of the goals of this conference was to enhance the conference experience for operation and maintenance professionals. Many of the presentations in Water, Wastewater, Special Topics, and Operations & Maintenance tracks emphasized topics that would be of interest to operations and maintenance personnel. The Operations & Maintenance track was organized by the Plant Operations & Maintenance Committee, and used a mix of presentations, demonstrations, and hands-on training to cover a variety of topics.

During Monday morning’s Opening Session, Joseph Glass, PE, engineering manager for the Fayetteville Public Works Commission, discussed the challenges presented when taking responsibility for aging infrastructure, and the benefits of a collaborative approach. The focus of Tuesday afternoon was infrastructure rehabilitation, with two forums featuring experts and professionals directly related to system rehabilitation on-hand to discuss and answer questions regarding current rehabilitation methods.

In the exhibit hall, there were 46 exhibitors displaying the latest products and services in the industry. Built into the conference schedule was plenty of time for all attendees to visit with vendors during lunch on Monday and Tuesday. The Spring Tailgate was a great, relaxing event with live music from Ray Cox (Highfill Infrastructure Engineering and NC AWWA-WEA Member), a corn hole tournament, and tailgate food. Some attendees also chose to participate in the new Vendor Bingo program, and met with vendors to earn the chance to enter into a prize drawing.

The 13th Annual Spring Conference will be held in Wilmington April 12-15, 2015. Please mark your calendars and don’t miss out! If you have a great idea or project you would like to present next spring, watch for the Call for Presentations that should be available this fall.

Thank you to everyone who worked on the 2014 conference planning committee, including the exhibitors and sponsors!

### Exhibitors
- A and W Electric, Inc.
- A.C. Schultes of Carolina, Inc.
- Antaira Technologies
- Asahi/America, Inc.
- Carolina Pumpworks, LLC
- Carotek Inc
- Charles R Underwood, Inc.
- Cleanwater Inc.
- Combs & Associates Inc.
- Covalen
- Crowder Construction Co.
- Daparak Inc.
- Dorsett Technologies
- Fortech
- General Industries, Inc.
- Hach Company
- Heyward Inc.
- Hydrostructures, P.A.
- Interstate Utility Sales Inc.
- Keck & Wood, Inc.
- Locus Technologies
- North Carolina 811
- Pace Analytical Services, Inc.
- Pete Duty & Associates Inc.
- Pipeline Renewal Technologies
- Premier Water, LLC
- Pumps Parts and Service
- Rivers and Associates, Inc.
- S&ME, Inc.
- Safeware Inc.
- Sanexen Environmental Services Inc.
- Signet Technologies
- Southern Corrosion, Inc.
- Spectrashield Liner Systems
- SR&R Environmental, Inc.
- Team Industrial Services Inc.
- Tencarva Municipal
- The Crom Corporation
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Membership

What You Get...

• Registration brochures for conferences, schools & seminars in North Carolina
• Reduced registration rates at conferences, seminars & schools offered by NC AWWA-WEA
• The latest information in your field from state and/or national professional publications
• Access to public education materials and resources, along with reduced costs on NC AWWA-WEA bookstore purchases

How You Get It...

Join NC AWWA-WEA in one of three ways:

• NC State Level Association Membership (NC SLAM)
  919-784-9030 or www.ncsafewater.org
  Annual dues for 2013 are $45.

• National AWWA
  800-926-7337 or www.awwa.org
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The Heart of Your Process
Welcome New Members!

The following people became members of NC AWWA–WEA in January, February, or March of 2014 by joining AWWA or WEF and choosing NC as their home state or as an additional membership state, or by joining at the state level with a NC SLAM membership. We welcome these professionals to the Association and look forward to seeing them at future events and working with them on various projects and committees.

We want to learn more about our members! If you are a NC AWWA–WEA member and would like to introduce yourself to our membership, email your photo and the answers to the following three questions to Nicole Banks at nbanks@ncsafewater.org, and you may be featured in an eNews email or on www.ncsafewater.org.

1. Where did you go to school and what did you study?
2. Where do you work, what’s your title and what is your main job?
3. Why did you join NC AWWA–WEA?

For information on how to join, and the membership options available, please visit www.ncsafewater.org/about/membership. Most of the Association’s work is carried out through committees. To learn more about each committee, review the list of active committees at www.ncsafewater.org/committees, and click on a committee’s name to learn more about it. To express your interest in learning more about a committee, contact the committee chair directly, or complete the Online Volunteer Form available at www.ncsafewater.org/committees.

Next to some new members names, you may see the name of their endorser or sponsor that recruited them to become a member. The endorser/sponsor who recruits the greatest number of members may be recognized at the NC AWWA–WEA Annual Conference with one of the following awards:

The Maffitt Membership Cup honors Mr. McKean Maffitt and is given annually to the member of the NC Section AWWA who secures the greatest number of new members.

The William M. Piatt Membership Award honors Mr. William M. Piatt and is given annually to the member of the NC WEF Member Association who secures the greatest number of new members.

American Water Works Association (AWWA)
Taylor Bomarito – Hazen and Sawyer PC
Stephen Brown – CEC Inc.
Meredith Bullard – Garner High School
Tamara Byers – City of Charlotte
John Collett – Hazen and Sawyer
John Core – WK Dickson
Kaylee Cravener
Robin Deal
Jeff Dennard – City of Thomasville
Anna Ediger
Ellis Edwards
Justin Farmer – Greenville Utilities Commission
William Fay – Town of Burgaw
Thomas Fitzgerald – Schnabel Engineering
Tommy Floyd – MB Kahn Construction Co. Inc.
Mike Fulbright – Town of Mooresville WTP
Greg Griffin – Halifax County
Ken Griffin – Town of Smithfield
Mark Harris – Charlotte-Mecklenburg Utility Department (sponsor Philip Longina)
Todd Hathaway – Kruger Inc.
James Hennessy
Daniel Holloman – Town of St. Pauls
Frederick Hughes – City of Raleigh
Thomas Johnson – Davidson Water Inc.
Kevin Kostiuk
Renee Long Cole – Cherokee Water & Sewer
Ronald Massey, II – City of High Point
Anna Ostendorff – City of Mount Holly
Patrick Payne – City of Raleigh
Mark Panny
Ray Patterson – Town of Louisburg
Lloyd Proutt – Carolina Management Team
John Raiford – Woolpert LLP
Rick Riley – City of High Point
Ann Schmucker – Carboline Company

Water Environment Federation (WEF)
Adam Sharpe – CH2M Hill
Linda Smith – City of Raleigh
Steven Smith – Town of Banner Elk
James Tayson – Cape Fear Public Utility Authority
Stephen Thorwart – PP&S – Environmental
Eric Tweed – CH Engineering
Michael Warner – City of Raleigh
Katherine Weidner
Reginald Widemon – City of Asheville
Town of Burgaw (organizational member)
Yadkin Valley Sewer Authority (organizational member)

NC SLAM
Arnel Abad – City of Goldsboro
Greg Adcock – South Granville Water & Sewer Authority
Gale Antonucci – West Carteret Water Corp
William Asbell – Greenville Utilities
Justin Atwell – City of Lexington
Alyssa Benson – Town of Cary
Anthony Boahn – McKim & Creed
Michael Boerstler – City of Raleigh
Toni Branson – City of Greensboro
Christopher Brown – HDR
Seth Clapp – City of Asheboro
Steven Cort – Ecomag LLC
Membership in the Water Environment Federation (WEF) carries many benefits and exclusive perks. Because members help protect and enhance water quality, WEF strives to provide them with access to the knowledge and tools needed for sustainable water resource management, water protection, and water and wastewater treatment.

Benefits include discounts on WEF’s many educational events and various educational products and services, access to technical publications and regulatory updates, unique networking and career-building opportunities, and the ability to join WEF committees and receive WEF awards.

To help members stay updated on advances, trends, and solutions, WEF provides access to such publications as Water Environment & Technology and the WEF Conference Proceedings.

To help facilitate continual learning and help members earn Continuing Education Units (CEUs), Professional Development Hours (PDHs), or contact hours, WEF offers discounts to WEFTEC and other conferences, seminars, and workshops. WEF also offers discounts on books and manuals of practice, as well as online courses in the WEF Knowledge Center.

To enhance networking and professional relationships, WEF provides many opportunities to join discussions with other sector professionals through such venues as WEFCOM (the WEF member online workspace) and WEF’s Linkedin page. WEF members also can build leadership skills through participating in WEF committees. Committees develop and discuss ideas and actions in many fields pertaining to water resources, wastewater, and water quality.

To help advance careers, WEF provides members with the opportunity to nominate or to be nominated for awards. A number of WEF awards, recognizing outstanding contribution to the water environment profession, require nominees to be members. WEF also provides access to the WEF Job Bank.

Because WEF realizes that membership needs vary from one individual or group to the next, it offers a number of different membership categories. Primary membership categories include Professional, Professional Wastewater Operator, Young Professional, and Student. WEF’s Utility Partnership Program enables utilities to consolidate all employee members into a single account and choose the appropriate value packages based on employees’ needs. WEF also offers other opportunities for corporate members and international members.

For more information on WEF membership or how to join today, contact Jessica LaFever at jlafever@wef.org or (703) 684-2400 ext. 7052.
Our reputation didn’t just happen. It’s been built project by project for over half a century.

As we’ve performed municipal, private, and industrial work through integrated project delivery methods such as Design-Build and CMAR, people across the country have come to depend on us for quality, integrity, and customer satisfaction — The Garney Way. Garney is your total water solutions provider. Let us help solve your water issues.
Annual Conference Exhibit Registration
NC AWWA-WEA’s 94th Annual Conference will take place November 16-19, 2014 in Winston-Salem, NC with the exhibit hall and many conference activities located in the Benton Convention Center. Companies are invited to take advantage of this opportunity to meet with water and wastewater professionals from across North Carolina and surrounding states. Online exhibit registration opened May 21 with 156 10’ x 10’ exhibit booths available for a fee of $1,000 per booth.

The Exhibits Committee has planned several attention-grabbing activities designed to draw as many attendees as possible into the exhibit hall and encourage them to stay and visit displays, including buffet services and tables, SS Induction, award programs, social hours, breaks, and door prize drawings. This year’s exhibit set-up will accommodate the Operations Challenge, including the new Safety Event and the Pipe Tapping Competition in the exhibit hall.

More details about exhibiting at the Annual Conference are available at www.ncsafewater.org/events_education/conferences/annual. Questions about Annual Conference exhibits should be directed to Marianne Keser at mkeser@ncsafewater.org or (919) 784-9030 x240.

Operations Challenge Supplies Needed
The organizers of the Operations Challenge competition are in need of the following equipment for the 2014 competition. If you can supply any of these items, contact the event coordinator listed. Organizations making equipment donations will be recognized as sponsors of the Operations Challenge Competition.

Collections Event
- 10 – LENOX 4.5-inch circular cutting blades (model 72L), or equivalent
- 10 – 4-inch service saddles with attached gasket
- 12 – flexible repair couplings (FERNCO)
- 20 – LENOX saw handles with 18” PVC saw blades (model HS F180)
- 10 – new full length-8 inch SDR 35 pipes

Event Coordinator: Greg Morgan, gregmorgan@co.union.nc.us or (704) 507-0372

Scoring and Process Control Events
- HP 932 and 933 ink cartridges (For printing process control tests and official score sheets)
- 8 ½” x 11” printer paper
- Basic calculators (solar powered)
- Digital stop watches
- 10” x 13” manila clasp envelopes
- Sharpie markers (black)
- #2 pencils

Event Coordinator: Billy Allen, ballen@charlottenc.gov or (704) 553-2124

Pipe Tapping Supplies Needed
The organizers of the annual Pipe Tapping Competition are in need of the following equipment for the 2014 competition. If you can supply any of these items, contact Brandon Miller, City of Raleigh, utilities supervisor at (919) 795-0437 Cell, (919) 996-4528 Office, or Brandon.W.Miller@raleighnc.gov. Organizations making equipment donations will be recognized as sponsors of the Pipe Tapping Competition.
- 14 – CC by Flare Corp stops ¾” one piece
- 14 – Flare by Flare Curb stops ¾”
- 2 – 100-ft rolls of type K Copper ¾”
- 4 – 14” Pipe wrenches
- 4 – 6” Wedge action, restraining glands (Megalugs kits)
- 2 – 6” Cast iron solid caps
- 2 – 6” Cast iron cap with a 2” tap
- 4 – Reed copper tubing cutters 5/8” to 2 1/8”
- 4 – Bags of Cutter Wheels
- 4 – Allen wrench sets standard and metric
- 4 – Flaring tools ¾”
- 2 – Mueller B-101 drilling and tapping machine

2014 Photo Contest
The NC AWWA-WEA Communication committee is pleased to announce the fifth Member Photo Contest. Through this contest, we are soliciting photos to be used in our publications and on www.ncsafewater.org.

The four categories for submittal are: Our Members at Work, Environment, Structures, and Critters Around Us. Each submittal must be accompanied by a completed NC AWWA-WEA Entry/Photo Release Form (available at www.ncsafewater.org). Photos should be no less than 300 dpi (set your camera to take the highest resolution photo). Please ensure photos represent activities compliant with safety and environmental regulations.

Photos and entry/release form must be received by September 1, 2014 to be considered for the competition. Winning photos/photographers in each category will receive a $50 gift card and will be recognized at the Annual Conference. The Communication Committee will select judges for the contest. Members may enter more than one photograph.
News and Notes

Email photos and entry form/photo release to Nicole Banks at nbanks@ncsafewater.org.

Growing Relationships and Opportunities through Water Resources – GROW

NC AWWA-WEA invites you to come GROW with us! Our vision is for regional GROW meetings to foster a sense of community among NC AWWA-WEA members, serve as an informal setting to introduce non-members to the benefits of membership, and overall increase communication and coordination among water professionals in the region and across North Carolina. While the location and topic for each meeting will change, all GROW meetings will offer high-quality technical content, great food, and networking at an affordable cost.

The first two events, in April in Charlotte and June in Asheville, were great successes and enjoyed by everyone in attendance. Additional events are scheduled for August 28, 2014 in Greensboro, October 23, 2014 in Raleigh, and December 11, 2014 in Wilmington. All meetings are open to everyone from any part of North Carolina.

To help offset the cost of GROW meetings, sponsorship is appreciated. Sponsorships received for GROW events will cover venue and food costs so that we can reduce the registration price, removing cost as a barrier to participation, increasing attendance at the event, and encouraging more communication among industry members. Sponsorship of a GROW event is $250 per event and includes recognition during the welcome at the event, corporate logo in PowerPoint presentation and/or on handouts, and organization name listed with the event on www.ncsafewater.org. If you are interested in sponsoring one or more GROW events, registration is available online through our 2014 Sponsorship Program form. For more information on sponsorship, contact Nicole Banks at nbanks@ncsafewater.org or (919) 784-9030 x250.

Poster Contest

Each year, the NC AWWA-WEA’s Public Education Committee sponsors a poster contest in conjunction with the celebration of Drinking Water Week in May. This year’s theme was ‘Every Drip Counts.’ Students in grades K-8 are eligible to participate and are separated into three divisions: K-2, 3-5, and 6-8. All utilities in the state are encouraged to promote the contest among local schools (public and private) and home schoolers. Participating members select first place winners from their city/utility, which are submitted for the statewide competition. Public Education Committee (PEC) members then select first, second and third place winners in each division. This year’s winners are as follows:

1st (K-2) Caniya M. Hall, David D. Jones Elementary (in Greensboro).
2nd (K-2) Parker Zoubek, Trinity School of Durham and Chapel Hill.
3rd (K-2) Sam Slowik, Trinity School of Durham and Chapel Hill.

1st (3-5) Josephine Wilson, Morehead Montessori Magnet School (Durham).
2nd (3-5) Mukta Dharmapurikar, Durham Academy.
3rd (3-5) Kayile DeArmey, Morehead Montessori Magnet School (Durham).

1st (6-8) Jaclyn McVey, Voyager Academy (Durham).
2nd (6-8) Natalie Maude, Voyager Academy (Durham).
3rd (6-8) Anette Medina, Shepard Magnet Middle School (Durham).
In the Q&A below, O’Neill shares her plans and vision for WEF and the water sector with WEF Highlights.

What are the primary short-term and long-term goals for WEF?

**O’Neill:** We have an exciting and visionary strategic direction that has focused WEF on water-sector innovation, awareness of the value of water, and the expertise of global water professionals.

This strategic direction was developed by our Board of Trustees and senior staff who listened carefully to the opinions of WEF members and other water leaders about current and future water profession needs.

It has driven the identification of practical short- and long-term goals related to contributing tools and developing knowledge in such areas as resource recovery and holistic water management. We are also focusing attention on helping our members communicate the true value of water to the public as well as defining the skills and attributes water professionals of the future need and how we can support development of these skills.

What are the largest challenges facing the water sector?

**O’Neill:** In an era of climate change and competing demands, the primary challenge is meeting the water service needs of growing and, in some cases, shifting populations with an eye to resiliency and flexibility. North America and other developed parts of the world face additional layers of complexity from the challenges of integrating legacy systems, replacing aging infrastructure, and, in some cases, addressing combined sewer overflows.

What do you see as WEF’s role in facing these challenges?

**O’Neill:** WEF will help share and distill knowledge. WEF’s diversity and our strength as a practitioner-rich community allows us to help bridge the gap between new water management research and theory and practical, on-the-ground adoption and implementation. We can shine a light on successful early adopters, and contribute to the identification, verification, and dissemination of leading practices that catalyze implementation of innovative and practical solutions.

Under your leadership, what will WEF seek to do differently than it has done before?

**O’Neill:** As executive director, I am just one element of WEF’s leadership and a responsibility to lead the staff, manage operation of the organization, and work with the board on planning.

I will focus on enhancing WEF’s operation through consistent application of business practices while maintaining the sense of volunteer ownership that makes us much more than a business. Using business analytics and data, while developing clear and overarching strategies, can foster greater understanding of where we are going, what we need to do to get there, and how we will know when we have arrived.

I believe we must ensure that the experience we offer to volunteers continues to evolve and grow. This advancement will allow WEF to keep sharing the expertise of our members today and into the future. Things have changed since I joined WEF more than 20 years ago: Today, we need to offer new high-quality engagement opportunities. But the high value water professionals place on information developed through WEF’s robust consensus and peer-review process has not changed. We will find new models to develop and synthesize high-quality, globally-informed technical information.

What will utilities of the future look like?

**O’Neill:** We already are getting a glimpse of what utilities of the future will look like and what they will deliver. While utilities historically have provided crucial services and been leaders in protecting public health and the environment, they often have operated in the background. Emerging utilities of the future are local development, innovators, leaders in resource recovery, and forces for the enrichment and greening of communities.

It is remarkable how quickly the role water utilities play in their communities is changing and how large an impact many are having on health, economy, and vibrancy of cities.
What role will innovative technologies play in the future for the water sector?

O’Neill: Innovative technologies are saving community resources and driving smarter water management. For example, short-cut nitrogen removal meets stringent nitrogen limits while decreasing use of energy and other resources, and asset management tools and data analytics enable better decision-making and resource allocation. I see these sorts of trends continuing.

Also, through the work of such programs as the WEF and Water Environment Research Foundation ‘Leaders Innovation Forum for Technology (LIFT),’ I see an increasing pace of adopting innovation in the US. As a country we have some of the best technical minds in the world and we lead in innovation in many spheres. Now we are putting our minds to work, making sure that the water sector and the public see the benefits of water innovation sooner rather than later.

Collaboration seems to be a buzzword in the water sector right now. How will WEF foster collaboration? Who needs to take part in this collaboration?

O’Neill: Effective collaboration is not just a priority for WEF, it is an expectation from our members and customers who are looking to maximize their investment.

The water sector is rich with opportunities and we believe there is room for contributions by many organizations. WEF is very open to both meaningful coordination and true partnerships. We prefer to identify specific collaborative activities and programs and build understanding and trust by working together.

Now that WEFTEC has become the largest water show of its kind in the world, what’s next for it?

O’Neill: It’s going to be hard to top the success of WEFTEC® 2013, but our staff and committees are hard at work planning for an even more interesting and vibrant program and event for WEFTEC 2014 in New Orleans. While being the world’s largest water show is a testament to the many individuals who contribute to WEFTEC, we are equally focused on growing the quality of the WEFTEC experience for exhibitors, sponsors, presenters, and attendees.

Once again we will be looking to bring in top experts from all over the world so that our attendees will have access to the best and most complete technical and thought leadership programming. We will continue providing tailored programming on innovation and stormwater — both of which have been very well received.

Attendees and exhibitors can expect to mingle with an international crowd again this year as WEFTEC grows in relevance as a major global event. The dynamic and unique water story of New Orleans can provide a unique context for discussions of new approaches to urban water management, recovery, and resilience.

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Death of Dusty Martin

Dusty Martin, operations supervisor at the Orange Water and Sewer Authority’s Jones Ferry Road Water Treatment Plant, died in a car accident in Raleigh on February 21, 2014. He was with OWASA for seven years and had previously worked at treatment plants in Lee County, Siler City, Cary, and Chatham County. Martin had been in the water industry for 21 years. In 2012, he received the 2012 A-Surface Operator of the Year award from the North Carolina Waterworks Operators Association (NCWOA). He was also the chair of the North Piedmont Section of the NCWOA and served on the Executive Committee and the Public Image Committee. Dusty volunteered each year to teach at the NCWOA spring operators school in Morganton and the NCWOA annual operators school in Raleigh. He is survived by his wife, Paula, and his two sons, James and Brandon.

Dewberry welcomes Pamela Townsend, PE, Senior Vice President

Dewberry welcomes Pamela Townsend, PE, to the firm as senior vice president and director of Southeast strategic planning and growth. She will also manage the firm’s Raleigh, NC, civil infrastructure operations.

Townsend comes to Dewberry from AECOM, where as senior vice president, she has held responsibilities for the Southern States District operations, including the profitability and overall direction of the $120 million, 500-person division. She has also been responsible for the Southern States and Florida transportation operations.

“We have gotten to know and respect Pam over the years through her reputation for client and project management and her community outreach,” says Darren Conner, president of Dewberry’s Southeast division.

“Her passion and dedication to our profession will make her a great fit at Dewberry.”

“I am excited to join Dewberry,” says Townsend. “We are going to be focusing immediately on expanding our services and growing our capabilities in the Southeast region. It’s a good time to be here.”

Townsend’s nearly 30-year career in the consulting engineering business includes program and project management of major federal, state, and local government projects. Noteworthy projects Pam has managed include complex environmental studies and permitting; major transportation infrastructure projects; and multiple infrastructure projects delivered through design-build and public-private-partnership contracts.

Townsend is a past president of Professional Engineers of North Carolina (PENC). She has also served as a director in American Council of Engineering Companies (ACEC) of North Carolina. She was a director on the WTS National Scholarship Board, chairing the scholarship selection committee, and served on the board of North Carolina Beautiful. She was appointed to the NC State University (NCSU) Civil Engineering Advisory Board, and in 2012, she chaired the NCSU Zia Lecture series on the Panama Canal Expansion, attended by more than 700.

Townsend has recently accepted a board position with the North Carolina Chamber of Commerce. She will also be serving on the executive committee of NCGO, a coalition of transportation advocates whose mission is to support efforts to improve transportation funding and improve the state’s transportation infrastructure.

Townsend co-chairs the Business Advisory Board for the new STEM WAKE/
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ADAPTABLE FOR TODAY’S CHANGING DEMANDS

Our experience in Aeration and Mixing, coupled with years of expertise in Biological Processes and Filtration Systems allows us to provide you with the most adaptable treatment solutions that offer the lowest cost of ownership. Aqua-Aerobic Systems’ advanced wastewater technologies meet or exceed the most stringent effluent requirements, including nutrient removal and water reuse, and are designed to easily accommodate changing effluent demands.

AERATION & MIXING
- Range of models, sizes and options
- Proven high-efficiency and reliable performance for over 40 years
- Aqua MixAir® process reduces power consumption; low total cost of ownership
- Endura® Series limited maintenance motors

FILTRATION
- Unique OptiFiber® cloth filtration media offer high quality effluent with minimal backwash
- Variety of customized mechanical designs for retrofitting existing filters or for new installations
- High filtration capacity results in a small footprint
- Low cost of ownership

BIOLOGICAL PROCESSES
Batch Processes
- Time-managed nutrient removal
- Unique subsurface decant avoids undesirable solids discharge
- IntelliPro® monitoring and control system enhances operation and performance
- Aqua MixAir® process reduces energy consumption; low total cost of ownership

MEMBRANE SYSTEMS
- Combines biological treatment with ultrafiltration membranes
- Direct filtration of mixed liquor with submerged membrane systems
- Enhanced process control with the IntelliPro® system

Flow-Through Systems
- Flow-through operation with multi-stage performance
- Enhanced nutrient removal capabilities
- Ideal for a wide range of design flows
- Unique phase separator reduces WAS volume 20-50%

IntelliPro® Monitoring and Control System
- Combines process monitoring and integrated comparative analysis
- Automatic adjustment of biological nutrient removal and chemical addition
- Proactive operator guidance via BioAlert™ process notification program
NCSU High School, focusing on Engineering Grand Challenges included in legislation developed by the JOBS Commission. Townsend received a Gubernatorial appointment to this joint legislative commission. She also currently serves on the Pathways to Prosperity Statewide initiative.

Townsend’s awards include WTS North Carolina Triangle Chapter’s Woman of the Year; Triangle Business Journal’s Women in Business; PENC President’s Award; and PENC Central Carolina Chapter Engineer of the Year.

Townsend received her bachelor's and master's degrees in civil engineering from NCSU. She holds professional engineering licenses in North Carolina, South Carolina, Alabama, and Georgia, and National Council of Examiners for Engineering and Surveying (NCEES).

**Dewberry Announces the Promotion of Robert “Skip” Notte**

Dewberry has promoted Robert “Skip” Notte, PE, LEED AP, to vice president in the Charlotte, NC office. He has more than 17 years of experience in the preparation of engineering studies and technical specifications, along with the design, utility coordination, and construction administration of water, sewer, land development, municipal, and civil engineering projects. He has worked on numerous projects for both public- and private-sector clients, private developers, and institutional clients across the Southeast and mid-Atlantic regions, coordinating with various state and local regulators.

Notte earned his bachelor’s degree in civil engineering from Virginia Tech. He is a member of the American Water Works Association and the National Council of Examiners for Engineering and Surveying. In 2002, Notte was awarded Dewberry’s Client Focus Award for his superior focus and commitment to his clients. He is also a licensed professional engineer in North Carolina, Georgia, Louisiana, South Carolina, and Virginia.

**About Dewberry**

Dewberry is a leading professional services firm with a proven history of providing architecture, engineering, and management and consulting services to a wide variety of public- and private-sector clients. Recognized for combining unsurpassed commitment to client service with deep subject matter expertise, Dewberry is dedicated to solving clients’ most complex challenges and transforming their communities. Established in 1956, Dewberry is headquartered in Fairfax, Virginia, with more than 40 locations and 2,000+ professionals nationwide.

To learn more, visit www.dewberry.com.

**2014 Photo Contest**

**Photos may be submitted in 4 categories:**

- Our Members at Work
- Environment Structures
- Critters Around Us

The winner from each category will receive a $50 gift card. Winners and honorable mentions will be announced at the November 2014 Annual Conference. All submitted photos may be used by NC AWWA-WEA online and in publications.

Entries Due Sept. 1, 2014

Sponsored by the NC AWWA-WEA Communication Committee

More information at www.ncsafewater.org

McAdams has hired Marco Menendez, PE as Director of Water/Wastewater to expand the firm’s capabilities in planning, design and construction services. Menendez brings nearly 20 years of water and wastewater design and management experience to McAdams.

“Marco brings to McAdams valuable experience and knowledge of the water and wastewater engineering market in North Carolina,” said McAdams President Mike Munn. “His resume and ambitions fit well into our strategic plan to expand our design services in this important market.

Menendez has been in the Raleigh area for over 11 years, focusing on developing relationships and leading design projects in the water/wastewater market. Before that, he worked in Virginia and in Florida where he earned a master’s degree in environmental engineering at the University of Florida. He has authored numerous published papers and presentations.

Some of his areas of specialty include energy savings in various water and wastewater treatment options, reclamation and re-use, odor control, and alternative treatment technologies. Menendez’s process experience covers all phases of design, start-up, testing and training. Marco is a longtime member of the North Carolina AWWA-WEA where he serves on the Annual Conference Program, Communication, Collection/Distribution, and Resource Recovery and Reuse committees.

The John R. McAdams Company was founded in 1979 and is a full-service engineering design consulting firm headquartered in the Raleigh/Durham area, with a regional office in Charlotte. The firm’s service offerings include civil engineering, land planning, landscape architecture, water/wastewater, stormwater, environmental, surveying, and construction services. The firm serves many clients in the residential, commercial, institutional, and government sectors. For more information, please visit www.mcadamsco.com.
Aqua-Aerobic Systems, Inc. Celebrates 45 Years of Servicing the Water & Wastewater Industry

Aqua-Aerobic Systems is proud to celebrate 45 years of providing exceptional products and customer service to the wastewater treatment industry. What began as a small manufacturing company in 1969 has grown to be a recognized applied engineering company and leader in total water management solutions.

Throughout the past four and a half decades, the company has focused on developing quality products in aeration and mixing, biological processes, filtration, membranes, and process control to meet specific water and wastewater treatment objectives for customers worldwide. In addition to product development, the company has also spent the last 45 years providing lifetime customer service.

Aqua-Aerobic Systems employs approximately 130 people in research and development, engineering, sales/marketing, manufacturing, customer and field service, and administration. The company is actively involved with water and wastewater related organizations and is a supporter of several community charities and local non-profits through sponsorships and employee volunteering.

About Aqua-Aerobic Systems, Inc.

Aqua-Aerobic has been a leader in the design and manufacture of wastewater treatment equipment and systems for both industrial and municipal markets, worldwide, since 1969. Its treatment solutions include aeration and mixing, biological processes, filtration systems, controls systems, membranes and aftermarket products. Aqua Aerobic Systems Inc. technologies meet or exceed the most stringent effluent requirements of today and are designed to accommodate changing effluent demands of tomorrow. For more information, please visit www.aqua-aerobic.com.

Aqua-Aerobic Systems Launches New ‘Request a Design’ Feature on Website

Aqua-Aerobic Systems recently launched a new and improved ‘Request a Design’ feature on the company’s website at www.aqua-aerobic.com. The feature allows prospective customers to easily request a technical application design for any of the company’s adaptive water treatment solutions, including aeration/mixing, biological processes, cloth media filtration and membranes.

“‘The online design requests were created to be user-friendly with easy click-through options and simple data entry,” says advertising and public relations manager Cheryl Kunz.

“When a design request is submitted directly from the company’s website, it is received and reviewed by an application engineer, who then works directly with the customer to provide a custom solution that best meets the plant’s treatment goals and effluent objectives.

Visit the company website and see all related resources on the products and systems pages, including the new and improved ‘Request a Design’ feature.

Keep Up with the Aqua-Aerobic Systems on Social Media

Aqua-Aerobic Systems is now using social media to stay in touch with its customers around the globe. Fans of the company’s YouTube channel and LinkedIn page will be among the first to hear the latest company news including product information and videos, new hires, success stories and job opportunities.

“We are excited to be extending the conversation with our customers into social media,” says Cheryl Kunz, Advertising and Public Relations Manager. “It is one more way we can connect with our customers, provide them with useful information and hear feedback directly from them.”

About Jonathan Creech

HIGHFILL is pleased to announce the addition of Jonathan P. Creech as a field representative. He will be responsible for ensuring that construction projects are completed in compliance with the approved construction documents. Jon emphasizes customer service by providing seamless communication between the field and the office, by facilitating interpretation of construction documents, and by interacting with those who may be temporarily inconvenienced by the construction. With the owner’s best interest in mind, he helps to ensure that the design objectives are accomplished in the field.

In his spare time Jon enjoys spending the weekends golfing or offshore fishing with friends.

About HIGHFILL

Highfill Infrastructure Engineering (HIGHFILL) is an engineering consulting firm that specializes in community and municipal water infrastructure. From initial planning through construction, our team members have the expertise and leadership skills to execute successful projects with efficiency. Our decisions are grounded in tenets of integrity, honesty, humility, and excellence. We place service before profit, the profession before personal gain, and the public welfare above all other considerations. We utilize proven principles, insightful ideas, and extensive experience to provide sustainable, enduring designs. Our attention to the appropriate details and our focus on the client enable us to deliver consistent quality service. Our expertise is centered in the following sectors: water supply, treatment, storage, and distribution facilities; wastewater collection, conveyance, treatment, and reuse facilities; stormwater management and treatment; civil site design for institutional, commercial, and residential developments.

Revere Control Systems

Revere Control Systems announces the opening of a new office in Charlotte, NC. This is the third remote office opened in the past two years, the others being in Chattanooga, TN, and Lakeland, FL.

According to President Bob Adams, “Our customer base continues to grow in the Carolinas, and it’s important for us to strengthen our base of operations to provide engineering, project management, and field service support to that base.”

Address for the new office is as follows: 2331-L Crown Point Executive Dr., Charlotte, NC 28277.
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To learn more, visit www.WatersWorthIt.org.
Raleigh Firm’s Infrastructure Design Creates Variety of Recreational Facilities

Freese and Nichols, Inc., of Raleigh, NC, has earned a National Recognition Award for exemplary engineering achievement in the American Council of Engineering Companies’ (ACEC) 48th annual Engineering Excellence Awards for designing a series of dams and lakes at the Summit Bechtel Family National Scout Reserve in Mount Hope, WV.

The site selected to be the permanent home of the National Scout Jamboree had no developed water features. Today it has lakes for swimming, fishing, rowing, and other aquatic activities thanks to the innovative design of four earthen embankment dams. Ranging from 35 to 80 feet tall and from 400 to 1,300 feet long, the dams were planned, designed, and constructed on an accelerated three-year schedule in order to be ready to host the Jamboree in July 2013. The two-part Goodrich Lake provides a scenic backdrop for an 80,000-person amphitheater. The dams also serve as key roadways and trailways connecting multiple campsites and activity centers.

The project is among 143 engineering projects throughout the nation and the world recognized by ACEC as preeminent engineering achievements for 2013. Judging for the Engineering Excellence Awards—known as the ‘Academy Awards of the engineering industry’—took place in February, conducted by a panel of more than 25 engineers, architects, government officials, media members, and academics. Criteria for the awards include uniqueness and originality, technical innovation, social and economic value, complexity, and success in meeting goals.

Final top winners, including 16 Honor Awards, eight Grand Awards and the prestigious ‘Grand Conceptor Award’ for the year’s most outstanding overall engineering achievement, were announced at the Engineering Excellence Awards Gala, a black-tie event held Tuesday, April 29, 2014 at The Grand Hyatt Hotel in Washington, DC.

The American Council of Engineering Companies (ACEC) is the business association of America’s engineering industry, representing more than 5,000 independent engineering firms and more than 325,000 professionals throughout the United States engaged in the development of America’s transportation, water and energy infrastructure, along with environmental, industrial and other public and private facilities. Founded in 1909 and headquartered in Washington, DC, ACEC is a national federation of 51 state and regional organizations.

Kruger Upgrades Franklin Township’s Treatment Capabilities With IFAS

Kruger Inc., a subsidiary of Veolia Water Solutions & Technologies, was awarded a contract by the Franklin Township Sewer Authority (FTSA) in Waynesburg, Pennsylvania to retrofit their existing wastewater treatment plant with the AnoxKaldnes™ Integrated Fixed-Film Activated Sludge (IFAS) process. The IFAS process utilizes polyethylene carrier elements (media), which are added to the plant’s aeration basins. This media provides a large surface area onto which beneficial microorganisms attach, forming a biofilm that supplements the activity of the suspended wastewater microorganisms. The result is the IFAS process provides an enhanced level of treatment in the same volume of tankage.

The existing FTSA facility was rated at 1.25 mgd and consisted of submerged rotating biological contactors (SRBC) for organic removal followed by aerobic activated sludge tanks for partial nitrification in the summer months only. The planned expansion will increase the plant’s treatment capacity to 2.0 mgd and will be designed to meet the new year-round effluent ammonia nitrogen limits at the new design loads. The SRBC units will be demolished and the existing tankage will be utilized for the IFAS to increase the nitrification capacity of the existing aerobic biological treatment system without needing to build new aerobic tankage.

In early 2011, a pilot project was conducted at the FTSA facility to demonstrate the capabilities of the AnoxKaldnes IFAS system. Based on the pilot’s successful results, together with the extensive experience and US installation base of AnoxKaldnes IFAS systems, FTSA, and their Consulting Engineer, selected Kruger as the basis of design for the facility upgrade. The upgraded facility is expected to be fully operational in the summer of 2015 and will provide Franklin Township a significant improvement to their facility’s treatment capabilities and capacity, while also giving them the flexibility to meet new treatment demands well into the future.

About Kruger and Veolia

Kruger Inc., supplies solutions and technologies for wastewater and drinking water treatment. Through years of extensive research and development, Kruger provides integrated solutions that optimize energy and operating costs. Kruger is a Veolia Water Solutions & Technologies company (www.krugerusa.com).

Veolia Water Solutions & Technologies is the Veolia Water subsidiary specialized in technological solutions and design and build projects for water and wastewater treatment, serving industrial and municipal clients. Veolia Water Solutions & Technologies recorded revenue of $3.1 billion in 2012 (www.veoliawaterst.com or www.veoliawatersna.com).

Veolia Water, the water division of Veolia Environment, is the world leader in water and wastewater services. Specialized in outsourcing services for municipal authorities, as well as industrial and service companies, it is also one of the world’s major designers of technological solutions and constructor of facilities needed in water and wastewater services. With 89,094 employees, Veolia Water provides water service to 100 million people and wastewater service to 71 million. Its 2012 revenue amounted to $15.9 billion (www.veoliawater.com or www.veoliawaterna.com).
Today’s forest industry is working hard to become one of the greenest industries on earth.

- What other industry plants hundreds of millions of trees every year?
- What other industry actually grows more of its main resource than it consumes?
- What other industry generates most of its own energy needs from renewable resources, including waste biomass, biogas, hydro and wind?
- What other industry uses a renewable resource and recycled stock as its main ingredients?
- What other industry has worked harder on improving its environmental performance with partners and advocates including governments, customers and environmental groups?

Paper is an essential part of human civilization. While we all use and depend upon electronic communications, it is easy to ignore that it comes at an environmental cost. Worldwide spam email traffic creates greenhouse gases equivalent to burning two billion gallons of gasoline yearly, with numbers rising. More than 200 million items of toxic e-waste are thrown away every year in the US alone, with a recycling rate of only 18% compared to 57% for paper. Estimates are that North Americans throw out more than 500,000 toxic computers and cell phones every day.

No industry is perfect. But the paper industry has made, and continues to make, huge investments in environmental responsibility. Specifying and buying paper from certified sources ensures the continuation and growth of carbon-absorbing forests. Using paper with appropriate amounts of recycled fibre helps preserve forests, conserve energy, and maximize fibre usage through paper lifecycles.

Paper is a powerful communications medium. Use it responsibly… and recycle the paper that you use.
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2014 Schedule of Events

The following schedule is current as of June 4, 2014. For updates or more information, please contact the organization listed with each event. If a listed event does not reference a specific organization, the item listed is a NC AWWA-WEA event. For further details concerning all NC AWWA-WEA events, visit the NC AWWA-WEA website at www.ncsafewater.org or contact the NC AWWA-WEA office directly at (919) 784-9030.

July 2014

14-18  **NC AWWA-WEA:**
Western Biological Wastewater Operators School
Morganton, NC

14-17  **NC AWWA-WEA:** Western Maintenance Technologist School & Exam – Grades 1 & 3
Morganton, NC

17  **NC AWWA-WEA Seminar/Webinar:**
Lessons for Water and Wastewater Utilities from Recent Incidents in NC and Elsewhere
Raleigh, NC and online

18  **NC AWWA-WEA Board of Trustees Meeting**
Asheville, NC

31  **NC AWWA-WEA Seminar:**
Drinking Water Rules & Regulations
Raleigh, NC

August 2014

4-8  **NC AWWA-WEA:**
Western Collection & Distribution School
Morganton, NC

21  **NC AWWA-WEA Seminar:**
Addressing Operational Challenges through SCADA
Greensboro, NC

26  **NC AWWA-WEA Seminar:**
Microscopic Examination for Wastewater
Location to be determined

28  **NCWTFOCB Exams (application deadline 30 days prior)**
Kinston, Morganton, and Raleigh, NC
NCWTFOCB (919) 707-9040

28  **NC AWWA-WEA Growing Relationships & Opportunities through Water Resources (GROW)**
Greensboro, NC

September 2014

4  **NC AWWA-WEA Seminar:** Reuse
Location to be determined

9  **NC AWWA-WEA Seminar:**
Advanced Topics in Wastewater Operations
Location to be determined

11  **NCWPCSOC Exams**
Kenansville, Morganton, Raleigh, Salisbury, & Williamston, NC
NCWPCSOC (919) 807-6353

15-18  **NC AWWA-WEA:**
Eastern Maintenance Tech School - Grades 1 & 2
Raleigh, NC

18  **NC AWWA-WEA Board of Trustees Meeting**
Raleigh, NC

23-26  **Customer Service Training**
Lillington, NC

27-Oct 1  **WEFTEC**
New Orleans, LA

October 2014

2  **NC AWWA-WEA Seminar:**
Collections & Distribution
Carrboro, NC

13-17  **NC AWWA-WEA Coastal Collection and Distribution School**
Morehead City, NC

22  **NC AWWA-WEA Seminar:** Risk Management
Location to be determined

23  **NC AWWA-WEA Wastewater Laboratory Analyst Exam**
Location to be determined

23  **NC AWWA-WEA Growing Relationships & Opportunities through Water Resources (GROW)**
Raleigh, NC

30  **NCWTFOCB Exams (application deadline 30 days prior)**
Kinston, Morganton, and Raleigh, NC
NCWTFOCB (919) 707-9040

November 2014

16-19  **NC AWWA-WEA Annual Conference**
Winston-Salem, NC

16  **NC AWWA-WEA Board of Trustees Meeting**
Winston-Salem, NC

19  **NC AWWA-WEA Board of Trustees Meeting**
Winston-Salem, NC

December 2014

3  **NC AWWA-WEA Seminar:** Industrial
Raleigh, NC

9  **NC AWWA-WEA Seminar:** Construction Issues
Location to be determined

11  **NCWPCSOC Exams**
Kenansville, Morganton, Raleigh, Salisbury, & Williamston, NC
NCWPCSOC (919) 807-6353

11  **NC AWWA-WEA Growing Relationships & Opportunities through Water Resources (GROW)**
Wilmington, NC
Grundfos introduces three new wastewater systems for the North American market. These systems work as one - allowing you to precisely know what is occurring throughout your network.

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Stephen H. Sorrells, Comer City Clerk
Comer, Georgia

AFTER

...after 4 years we have not had to take these tanks offline once to address Nitrification and we have been able to maintain optimum combined residuals and free Ammonia levels to date. SonicSolutions ultrasonic units offer a first line defense against the formation of biofilm and ground storage tank Nitrification.”

Steven Miles, Water Production Manager
Port Orange Florida Potable Water Plant

“A SonicSolutions system was installed at one of our surface water treatment plants producing drinking water. The device controlled algae growth on the walls of the sedimentation basin after discontinuing the pre-chlorination step to reduce the formation of disinfection by products during water treatment. It was a successful treatment change.”

Christian J. Volk, Virginia-American Water

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- OPERATIONAL PROCEDURE MANUALS
- FINANCIAL ANALYSIS & RATE STUDIES
- MASTER PLANNING & FEASIBILITY STUDIES
- ENVIRONMENTAL ASSESSMENT STUDIES
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**NC Currents** Future Themes & Submission Deadlines

*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](http://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 an issue’s 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.

### FALL 2014  Theme: Safety (Submission Deadline July 7, 2014)

Living in a fast-paced nation with tightened budgets due to the current state of the US economy, safety in the workplace can often be compromised. Management must have a dedicated and dynamic approach to worker safety during the construction, maintenance, and operation of water/wastewater infrastructure through proper employee engagement, teamwork, training, and follow-up/feedback. We should work toward eliminating accidents and near misses involving employees in the workplace. Therefore, we must always continue to evolve and develop new ways to make our workplaces safer and give all employees an opportunity to take charge/have ownership of the company safety program; this includes sharing their views when it comes to safe work practices.

This issue will feature and explore the many general safety programs now available to both public and private entities and supported by the Occupational Safety and Health Administration (OSHA) at both the state and national levels. OSHA’s Core Mission is to “assure safe and healthful working conditions for working men and women by setting and enforcing standards and by providing training, outreach, education and assistance.” Many public and private entities have either utilized or started to utilize the many safety programs developed and supported by the Department of Labor (DOL) in various states. For example, the North Carolina DOL offers and administers both the Carolina STAR Program and the Safety and Health Achievement Recognition Program (SHARP) to all public and private entities in order to help promote and recognize effective safety and health management throughout the state.

As water and wastewater professionals, we need to concentrate on developing sound safety policies and procedures utilizing as much background information within applicable OSHA regulations and guidelines. We should determine the best possible plan and/or approach and pertinent management tools to help equip the majority of our current water and wastewater professionals with more safety-based solutions for many years to come.

**Theme Leaders:** Tom Bach (Water & Sewer Authority of Cabarrus County) tbach@wsacc.org, Marie Schmader (STV, Inc.) marie.schmader@stvinc.com, Wade Shaw (City of Raleigh) wade.shaw@raleighnc.gov, Marianna Boucher (McKim & Creed) mboucher@mckimcreed.com

### WINTER 2015  Theme: Alternative Delivery Methods (Submission Deadline September 29, 2014)

In August 2013, House Bill 857 was signed into law by Governor McCrory. This new law (*Session Law 2013-401*) allows all state agencies and local governments to utilize various forms of project delivery, including design-build, construction management at risk, and public-private partnerships (P3) without involving legislative approval for each project. This law also puts North Carolina in a group with only four other states (VA, FL, CO, AZ) that specify design-build contracts are to be selected based on qualifications (QBS). While this new law could greatly benefit public water and wastewater utilities in North Carolina, there are still many unknowns about the different alternative delivery methods; why one contracting method should be selected over another, the potential benefits of alternative delivery versus traditional design-bid-build, the benefits of QBS in reference to design-build, and the lessons learned from other alternative delivery projects. In the *NC Currents* Winter 2015 issue, we invite the submission of articles that provide case studies describing the alternative delivery contract selection process, the pros and cons of alternative delivery, comparison of QBS design-build versus price-based design-build, and lessons learned throughout the entire alternative project delivery process.

**Theme Leaders:** Marco Menendez (McAdams) menendez@mcadamsco.com, Brigette Welton (Dewberry) bwelton@dewberry.com, Kelly Boone (CDM Smith) boonekr@cdmsmith.com, Steve Hilderhoff (GHD) steven.hilderhoff@ghd.com

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If the challenge involves water, we're up for it. We offer you a world of expertise, with value for today and foresight for tomorrow, for all of your unique water challenges. We're building a world of difference. Together.

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Raleigh  919-462-0250
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The Value of Water: The value of water is immeasurable. It is a vital resource in every form of nourishment we need for our bodies to survive, and in every commodity we use. We in the USA have clean, safe water delivered to our homes every day. But over 3.5 million people die each year from water-related diseases all over the world.

The Cost of Water: Compared to the cost of other utility bills, water is a bargain. However, this cost of water is not sustainable. The 2009 Report Card on Americas Infrastructure indicates total investment needs over the next 20 years for water and wastewater infrastructure to be over $200 billion dollars; over $16 billion dollars in North Carolina alone.

Your Obligation and Opportunity: We have clean water because of the work of thousands of dedicated water and wastewater professionals in North Carolina, but it is everyone’s obligation to keep our water safe, clean and available for generations to come. Consider pursuing one of the many career opportunities in the water industry for a fun, exciting, and rewarding future.
The active participation of our members is the key to our success. Each member can make a contribution by sharing a small amount of their time to help with the Association’s work. Please look over the list of committees and choose a few that are of interest to you. To join a committee, complete the Volunteer Form (available at www.ncsafewater.org), contact the NC AWWA-WEA office or contact a committee’s chair directly.

### EXTERNAL AFFAIRS COUNCIL
- Communication
- Membership Services
- Public Education
- Water For People
- Students & Young Professionals

### TECHNICAL PROGRAM COUNCIL
- Seminars & Workshops Committees
- Seminars & Workshops Automation
- Finance & Management
- Industrial
- Regulatory Affairs
- Resource Recovery & Reuse
- Risk Management
- Sustainability
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- Col & Dist Schools
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- WW Lab Analyst
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<table>
<thead>
<tr>
<th>COMPANY</th>
<th>PAGE</th>
<th>PHONE</th>
<th>WEBSITE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Alliance Consulting Engineers</td>
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<tr>
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<td>815-654-2501</td>
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</tr>
<tr>
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<td>919-854-1282</td>
<td><a href="http://www.arcadis-us.com">www.arcadis-us.com</a></td>
</tr>
<tr>
<td>BDP Industries, Inc.</td>
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<td>518-527-5417</td>
<td><a href="http://www.bdpindustries.com">www.bdpindustries.com</a></td>
</tr>
<tr>
<td>Bio Green Services, Inc.</td>
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<td>336-940-4544</td>
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</tr>
<tr>
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<td>407-548-8561</td>
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</tr>
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<td>502-964-3361</td>
<td><a href="http://www.caldwelltanks.com">www.caldwelltanks.com</a></td>
</tr>
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<td>Calgon Carbon Corporation</td>
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<td><a href="http://www.calgoncarbon.com">www.calgoncarbon.com</a></td>
</tr>
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</tr>
<tr>
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<td>800-543-2938</td>
<td><a href="http://www.cbi.com">www.cbi.com</a></td>
</tr>
<tr>
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</tr>
<tr>
<td>CH2M Hill</td>
<td>6</td>
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</tr>
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<td>ClearWater, Inc.</td>
<td>48,49</td>
<td>828-855-3182</td>
<td><a href="http://www.clearwaterinc.net">www.clearwaterinc.net</a></td>
</tr>
<tr>
<td>Combs &amp; Associates, Inc.</td>
<td>54</td>
<td>704-374-0450</td>
<td><a href="http://www.combs-associates.com">www.combs-associates.com</a></td>
</tr>
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<tr>
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</tr>
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</tr>
<tr>
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<td>21</td>
<td>704-822-8444</td>
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</tr>
<tr>
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<td>919-582-5850</td>
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</tr>
<tr>
<td>Garney Construction</td>
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<td>407-877-5903</td>
<td><a href="http://www.garney.com">www.garney.com</a></td>
</tr>
<tr>
<td>Hazen &amp; Sawyer, P.C.</td>
<td>27</td>
<td>919-833-7152</td>
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</tr>
<tr>
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</tr>
<tr>
<td>Heyward Incorporated</td>
<td>3,94</td>
<td>704-583-2305</td>
<td><a href="http://www.heyard.net">www.heyard.net</a></td>
</tr>
<tr>
<td>Huber Technology, Inc.</td>
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<td>704-990-2055</td>
<td><a href="http://www.huber-technology.com">www.huber-technology.com</a></td>
</tr>
<tr>
<td>Hydro International Wastewater</td>
<td>11</td>
<td>866-615-8130</td>
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</tr>
<tr>
<td>Infilco Degremont</td>
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</tr>
<tr>
<td>Jacobs</td>
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</tr>
<tr>
<td>Kemira</td>
<td>14</td>
<td>800-879-6353</td>
<td><a href="http://www.kemira.com">www.kemira.com</a></td>
</tr>
<tr>
<td>Kimley-Horn and Associates, Inc.</td>
<td>93</td>
<td>888-542-4636</td>
<td><a href="http://www.kimley-horn.com">www.kimley-horn.com</a></td>
</tr>
<tr>
<td>Kruger Inc.</td>
<td>83</td>
<td>919-677-8310</td>
<td><a href="http://www.krugerusa.com">www.krugerusa.com</a></td>
</tr>
<tr>
<td>Kusters Water</td>
<td>13</td>
<td>800-264-7005</td>
<td><a href="http://www.kusterswater.com">www.kusterswater.com</a></td>
</tr>
<tr>
<td>LEE SUPPLY CO. INC.</td>
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<td><a href="http://www.lesupply.com">www.lesupply.com</a></td>
</tr>
<tr>
<td>Lord &amp; Company, Inc.</td>
<td>63</td>
<td>803-802-0060</td>
<td><a href="http://www.lordandcompany.com">www.lordandcompany.com</a></td>
</tr>
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</tr>
<tr>
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<td>704-841-2588</td>
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</tr>
<tr>
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</tr>
<tr>
<td>Oldcastle Precast</td>
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</tr>
<tr>
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<td>36</td>
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<td><a href="http://www.pease-ae.com">www.pease-ae.com</a></td>
</tr>
<tr>
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<td>16</td>
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</tr>
<tr>
<td>Pollardwater.com</td>
<td>96</td>
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</tr>
</tbody>
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