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The APWA Reporter, the official magazine of the American Public Works Association, covers all facets of public works for APWA members including industry news, legislative actions, management issues and emerging technologies.
“Whiskey is for Drinking; Water is for Fighting Over.” These words are commonly attributed to Mark Twain; however, there is no real evidence that he actually uttered this phrase. Regardless of who said it, this pragmatic phrase emphasizes the importance of water to our lives. Clean drinking water, wastewater and stormwater all have a role to play in modern society and we, as public works leaders, have accepted the challenge to manage this precious resource. It is a challenge internationally, with predictions for a future that places water use necessary for energy, human consumption and agriculture in conflict.

Throughout this edition of the APWA Reporter are accounts of how we, in the public works profession and industry, are strategically managing the most valuable resource on the planet. As you read these articles, I challenge you to think about how far we have come as a society in understanding the full cycle of water and how interdependent each stage is to the other. Think about how your contributions in managing water resources will leave a legacy for generations to come.

Remember back in grade school when we all learned about the water (or hydrologic) cycle? How the resource circulates from atmosphere, to ground, to rivers, to oceans, and back again; water falls from the mountains and travels through the countryside and cities, eventually ending up in the sea, then returning to the clouds to rain again another day? Now think about how each of these stages of the water cycle in recent history has been split up into separate disciplines or silos. Although great advances in each of these water management disciplines have been achieved over the past several decades, unintentionally these silos have been created, overshadowing the delicate balance in the broad hydrologic cycle. Segregation within the cycle creates further stress in managing opportunities to achieve optimal use and reuse of this finite resource.

To further compound the issue, in the U.S. regulations specific to each separate discipline have been adopted by federal and state governments. We see similar challenges created by the European Union environmental directives, addressing potable water, water quality, and flood control. Recently, an effort has been made to break down some of these silos within the U.S. regulatory regimen. Practitioners and regulators realize that wastewater and stormwater are the same resource that is used for drinking water. Drinking water ends up in the wastewater system, treated and mixed with stormwater for the next downstream drinking water system.

In November 1990, regulations were issued by the Environmental Protection Agency (EPA), under the Clean Water Act (CWA), to address stormwater runoff within urban centers. These new regulations were issued under the same authority as existing wastewater rules, leading to stormwater runoff controlled as a
“point source” discharge with permits issued to towns, counties, cities, large institutions such as universities, and departments of transportation. The permits allow for the direct discharge of runoff based on implementation of controls, treatment, and management strategies known as “Best Management Practices.”

Discrete water management approaches prescribed by use have resulted in a loss of holistic policies and practices, a loss of applying our knowledge of the interconnected nature of that earliest concept of the water cycle. Holistic management is critical for reducing the eventual conflict between needs for basic life support, industrial/agricultural demand and energy production. This new era will have its own set of challenges and opportunities. To address these issues, public works professionals must be able to fully investigate and understand the interconnection of the water cycle along with the intersection of the use/needs for the world’s economy. We will need to reach out from specific areas of expertise to others to understand how actions affect other areas.

Fortunately, the dialogue has already started. When cities and towns across the U.S. asked EPA to create a framework to allow a community to obtain a single, or integrated, CWA permit that could encompass potable water, wastewater and stormwater, communities such as Durham, N.H., and the Milwaukee Metropolitan Sewerage District began using this approach to consolidate their CWA permit for their municipal separate storm sewer system, their wastewater treatment plant, and drinking water sources. Combining these permits allows these agencies to look at stormwater and wastewater in a comprehensive way and to efficiently address regulations. This approach to permitting illustrates how advantageous integrating disciplines can be, both from a regulatory and operational standpoint, while hardening back to the no-nonsense sentiment attributed to Mark Twain and the critical role water resource management plays in our communities.

This new era must integrate all stages of the water cycle, as we capture, use, and reuse this resource across the globe. In the U.S., an integrated permitting process is one that has the promise of combining not only regulatory and bureaucratic endeavors but also sparks real hope for combining funding source to achieve the goal of further cleaning up the nation’s waterways. In today’s reality of decreasing revenue streams and increasing infrastructure needs, a holistic approach to addressing the public’s need for clean water will prove to be beneficial economically, environmentally, and socially as we continue to serve one of the public’s most essential needs.

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As part of APWA’s ongoing advocacy efforts, APWA has participated in several important pieces of Clean Water Act (CWA) litigation throughout the past year. APWA has participated in each of these cases because the issues addressed in these lawsuits could significantly raise the cost of stormwater pollution management for public works departments nationwide.

Below is a summary of the cases APWA has been involved in:

**LA County Flood Control District v. NRDC & Santa Monica Baykeeper**

In 2008, NRDC and the Santa Monica Baykeeper sued the LA County Flood Control District alleging that the District violated its National Pollution Discharge Elimination System (NPDES) permit by channelizing polluted stormwater from one portion of a river to another. At issue in the case is the NPDES permit issued by the state in 2001 to the District to regulate stormwater discharges to the Los Angeles and San Gabriel Rivers. The permit required installation of monitoring stations in a channelized portion of the river upstream from the discharge points that were located in a natural portion of the river. NRDC and Santa Monica Baykeeper filed suit arguing that results from the required monitoring stations showed that the District’s system was discharging pollutants in excess of permit limits.

The District court ruled in favor of the District, concluding that the NPDES permit makes each entity responsible for its own contribution to any pollution in excess of permit limits and because the monitoring stations at issue in this case only measured the aggregate pollution levels in the channelized portion of the river and was insufficient to establish that the District was liable for the excess pollution in the rivers. NRDC and its partners appealed and the Ninth Circuit Court reversed the lower court decision. In reversing the trial court, the Ninth Circuit concluded that the readings from the monitoring stations were sufficient to establish a permit violation. To reach this conclusion, the court concluded that the required monitoring stations were part of the District’s stormwater system that was separate and distinct from the two navigable rivers where they were located. Because the system was separate and distinct the Court found that there was in fact a discharge of pollutants occurring in violation of established permit limits.

The District petitioned the U.S. Supreme Court and the Court granted certiorari to determine whether a discharge or outfall occurs within the meaning of the CWA when water flows from one portion of a channelized river, through a concrete channel, into another portion of the river downstream. The Supreme Court heard oral arguments in December and will issue an opinion sometime in the spring.

APWA joined with the City of New York, NY State Conference of Mayors, American Water Works Association, Water Environment Federation, Association of Metropolitan Water Agencies, and the National Association of Clean Water Agencies (NACWA) in filing amicus curiae (friend of the court) brief supporting the District. In the amicus brief, the coalition argued that the flow of water from one portion of a river through an engineered improvement, to a downstream portion of the same river does not constitute a regulated discharge of pollutants under the CWA and that should the Court rule otherwise, municipalities and utilities nationwide will be threatened with overly burdensome and unnecessary regulation that will significantly affect routine water transfers that are indispensable to the provision of safe and affordable public water supplies as well as safe, effective stormwater and floodwater management.

**U.S. v. City of Renton**

APWA joined with NACWA and the National Association of Flood and Stormwater Agencies (NAFSMA) in filing an amicus brief supporting the City of Renton, WA and City of Vancouver, WA, claims against several federal facilities for failure to pay for locally imposed stormwater utility service charges incurred prior to January 2011. Amici’s brief focused on two points—first, that the CWA unambiguously waives sovereign immunity from reasonable service charges and second, that Congress passed the Cardin Amendment specifically to clarify federal responsibility to pay stormwater program charges in response to federal agencies that had ceased paying the charges, claiming that they were taxes and thus beyond the scope of the CWA existing waiver.
The case arose out of a July 2011 complaint filed by the United States requesting a refund of fees paid prior to January 2011, claiming that the fees were taxes and that the U.S. had not waived its sovereign immunity. The U.S argued that the 2011 Cardin Amendment, clarifying federal responsibility to pay stormwater utility fees, did not apply retroactively to charges incurred prior to January 4, 2011 when the amendment was signed into law. In ruling against the U.S., the District Court relied heavily on the APWA, NACWA and NAFSMA brief and held that the CWA unambiguously waives sovereign immunity and that the Cardin Amendment was a clarification rather than a substantive amendment to the CWA. The Court found that the federal facilities were responsible for charges imposed by the cities for stormwater management and abatement under the CWA.

DeKalb County, GA v. U.S. & U.S. Postal Service

APWA, NACWA and NAFSMA filed an amicus brief supporting DeKalb County, GA in a case seeking to recover monies owed by the United States and the United States Postal Service for the costs of stormwater management from federal properties pursuant to the County’s stormwater utility ordinance that became effective on January 1, 2004. DeKalb County alleges that various federal agencies and the United States Postal Service have refused to pay the County its stormwater fees assessed prior to January 4, 2011. These federal agencies argue, among other contentions, that the Cardin Amendment does not apply to stormwater services assessed prior to that date. The County claims that the Amendment merely clarified Congress’s 1977 waiver of the United States sovereign immunity for “reasonable service charges” under Section 313(a) of the CWA and applies to the charges in question incurred prior to January 4, 2011.

APWA and its partners argued that this suit raises issues of national significance with ramifications that would have significant consequences for municipal utilities in their efforts to meet stormwater obligations. Local stormwater authorities throughout the United States are creating stormwater utilities and the collection of user fees and service charges in order to implement the expanding requirements of the stormwater management programs required in municipal stormwater permits issued by state and federal environmental regulators. By far the most common approach to establishing an appropriate rate structure for such utilities, and the approach used by DeKalb County, is the use of impervious surface area to allocate costs based on each property’s contribution of runoff to the stormwater management system. These costs will certainly continue to increase given that stormwater remains a leading cause of water quality impairment and is the focus of increased federal regulatory requirements.

A decision is expected this spring.

VA Department of Transportation & Fairfax County, VA v. EPA

Once again, APWA joined with NACWA and NAFSMA in filing an amicus brief supporting the Virginia Department of Transportation and Fairfax County lawsuit challenging EPA’s authority to attempt to regulate stormwater volume or “flow” as a surrogate for the pollutants it is authorized to regulate under the CWA. APWA and its partners agree with VADOT and Fairfax County’s position that EPA’s action in adopting the Accotink Total Maximum Daily Load (TMDL) exceeds the Agency’s statutory authority and violates the CWA because flow is neither a pollutant as defined in the Act, nor a permissible surrogate for such a pollutant. The CWA requires each state to establish a total maximum daily load for specific pollutants. While stormwater flow or volume may contribute to pollution within the meaning of the CWA, it is not a pollutant as defined in the Act. The Act does not support the Agency’s attempt at changing and expanding the national TMDL program.

In addition to arguing that EPA exceeded its statutory authority by establishing a TMDL based on a surrogate for sediment pollution, the amici and VADOT and Fairfax County also challenge the agency’s failure to follow required rulemaking procedures. Instead of complying with the requirements of the Administrative Procedure Act the agency merely issued an informal guidance document, Revisions to the November 22, 2002 Memorandum ‘Establishing Total Maximum Daily Load (TMDL) Wasteload Allocations (WLAs) for Storm Water Sources and NPDES Permit Requirements Based on Those WLAs,” to justify its approach. APWA, NACWA and NAFSMA, at the time the memorandum was issued, objected to the Agency’s attempt to fundamentally change EPA’s approach to regulating stormwater discharges without public review or comment and without publishing notice of its issuance in the Federal Register.

Arguments will occur this winter and a decision is expected thereafter.

Each of the cases involves significant questions about the Agency’s CWA authority and the federal government’s responsibility to support municipalities and utilities as they work to manage stormwater pollution and meet the requirements of the CWA. These costs will certainly continue to increase given that stormwater remains a leading cause of water quality impairment and is the focus of increased federal regulatory requirements.

Julia Anastasio can be reached at (202) 218-6750 or janastasio@apwa.net.
Call for nominations to APWA Board issued

APWA's National and Regional Nominating Committees are currently issuing a call for nominations for Board of Directors positions.

President-Elect and At-Large Directors Seats
The National Nominating Committee is currently accepting nominations of candidates in two positions: President-Elect and At-Large Director seat in the functional area of Fleet & Facilities Manager. The President-Elect serves a one-year term as President-Elect, followed by one-year terms as President and Past President, respectively. At-Large Directors serve two-year terms and are eligible to serve three consecutive terms.

Both Regional and At-Large Directors’ terms of office are two-year terms, with a maximum of three consecutive two-year terms. For 2013, those elected to office will begin their term at the start of Congress in August 2013.

At-Large Directors Seats
Fleet & Facilities Management: Brian R. Usher, PWLF, Largo, Fla., is completing his first two-year term and is eligible for a second two-year term.

All nominations must be in the committee’s hands no later than 5:00 CDT, April 1, 2013. The National Nominating Committee will then meet in early May to make decisions on the ballot for the President-Elect position and the At-Large Director position. Candidate nominations may be self-nominations, may be submitted by any APWA member, or by a chapter.

Regional Director Seats
There are five Regional Director seats open for nomination this year. Regional Nominating Committees will set the ballot for Regional Directors in Regions I, II, V, VI and VIII. Seats are currently held by:

Region I: Richard F. Stinson, PWLF, Wakefield, Mass., is completing his first two-year term and is eligible for a second two-year term.

Region II: Harry L. Weed, II, PWLF, Rockville Centre, N.Y., is completing his first two-year term and is eligible for a second two-year term. (His one-year appointment to fill the vacancy is considered a full two-year term.)

Region V: Linda Petelka, BSC, PWLF, is completing her first two-year term and is eligible for a second two-year term.

Region VI: Larry Stevens, P.E., PWLF, is completing his third two-year term and is not eligible for another term as regional director.

Region VIII: Ron Calkins, P.E., PWLF, is completing his second two-year term and is eligible for a third two-year term.

All terms will begin at the start of Congress, August 2013.

APWA members wishing to put names before their respective Regional Nominating Committee should send a letter of recommendation for each suggested candidate to the Region I, II, V, VI or VIII Nominating Committee in care of the national office of APWA by 5:00 p.m. CDT, April 1, 2013. All nominations will then be forwarded to the respective Regional Nominating Committees.

Candidate nominations may be self-nominations, may be submitted by any APWA member, or by a chapter.

Nominations for national APWA appointment
APWA is now soliciting nominations for appointments to national level committees/task forces/external relationships for the August 2013–August 2014 year. Step forward and offer your expertise to your profession. Contact your local chapter to let them know you have an interest in serving at the national level. Information on appointments may be obtained on the APWA website at www.apwa.net/membersonly/nominations or from Cindy Long at clong@apwa.net or (816) 595-5220. A brief biographical statement must be completed online or submitted as hard copy. Nominations for committees/task forces/external relationships must arrive at headquarters by close of business April 1, 2013.
How to Nominate an Individual for National and Regional Offices

A package of information (electronic format is preferred) must be submitted on each nominee to contain the following:

1. A letter of nomination addressed to the Region I, II, V, VI, or VIII Nominating Committee or to the National Nominating Committee (whichever is appropriate). The letter must affirm that the nominee has expressed a willingness to serve in the office for which he/she is being nominated, the office designation for which he/she is being nominated, and a brief statement to indicate the person’s appropriateness for the office.

2. A current photo of the nominee and a letter from the nominee’s employer stating acceptance of the time commitment involved with the position. Questions related to time commitment for Board positions should be directed to Cindy Long who will put nominees in contact with a current Board member.

Each nomination must be in a separate letter. Electronic submissions are preferred. All nominations and questions should be directed to:

Cindy Long
APWA
2345 Grand Blvd, Suite 700
Kansas City, MO 64108-2625
Phone: (816) 595-5220
FAX: (816) 595-5320
E-mail: clong@apwa.net

The Board of Directors has issued a policy that the nominations process utilized by the National Nominating Committee for the President-Elect and At-Large Directors and the Regional Nominating Committees for the Regional Directors will be a “selection” process by the committee, not a “campaign” for office. The Board strongly discourages “campaign” activity and expenditure of funds in support of a candidacy.

Profile of an ideal candidate

Required for all offices:

- APWA member in good standing, with all dues and service fees paid

Desired for all offices:

- Knowledgeable and articulate on matters associated with public works and willing to serve as a spokesperson for APWA
- Highly respected in the community; solid professional ethical character
- Active in chapter, committee, House of Delegates activities
- Committed to APWA and its values and growth of the Association
- Willing to devote the time necessary to the fulfillment of the duties

Desired for President-Elect:

- Service in a leadership or officer role in an APWA chapter
- APWA national service; experience on the APWA Board of Directors is highly desirable
- Continuous membership in APWA for the last five years in a voting eligible classification
- Employed in the field of public works for five years within the last ten years, in a middle or higher management capacity
- High ethical and moral standards
- Demonstrated leadership ability
- Personal commitment to public works
- Broad understanding of public works elements, issues and disciplines
- Exhibits qualities of national stature
- Reputation of professionalism

Your Vote in APWA Does Count

As an APWA member, you will have the opportunity to vote for members of the APWA Board of Directors between July 5 and August 5, 2013:

- APWA President-Elect;
- At-Large Director in the functional area of Fleet & Facilities Management; and
- Regions I, II, V, VI and VIII Regional Directors (by APWA members in those respective regions)

The ballot will be available for online voting between July 5 and August 5, 2013 on the “Members Only” section of the APWA website. There will also be a voting icon on the home page of our website. If you do not have access to a computer at home or work, you may access the APWA website at your local public library or other public access points. If you are not able to vote online, you may request a paper ballot from Cindy Long at (816) 595-5220. Additional reminders of the voting process will be sent through the infoNOW Communities; via e-mail to every member for whom we have an e-mail address, and in future issues of the APWA Reporter.

If you have questions, please contact Cindy Long at clong@apwa.net or (816) 595-5220.
A PWA and the North Carolina Chapter are proud to bring the 2013 Show for Snow to one of America’s prominent Ice Belt cities: Charlotte, North Carolina! With a variety of winter weather events occurring in the Ice Belt annually, and even as far south as Dallas and Atlanta in recent years, it’s important to remember that winter maintenance is more than just snow removal.

With that in mind, the 2013 North American (Not Just) Snow Conference promises to be the best yet! Attendees will have the opportunity to sit in on one of the many outstanding educational sessions featuring the very best in snow and ice control, or take in the expansive lineup of fleet and emergency management solutions that fits their needs. They’ll also have an opportunity to visit the exhibit floor to network with peers and vendors as they discover the industry’s latest cutting-edge technologies, equipment and processes needed to help keep communities safe next winter! Join your fellow snowfighters at the Show for Snow in Charlotte, April 7-10.

The Queen City is the largest and most accessible city between Washington, D.C., and Dallas. Due to its mid-Atlantic location, getting to Charlotte is easy from anywhere in the country, hence its nickname “the International Gateway to the South.” But there’s a lot more to experience in Charlotte! Beyond the modern skyline of Center City you’ll find streetcar-era communities where buildings range from vintage factories to grand southern estates. Check out one of the many NASCAR race shops in the area or take time to admire turn-of-the-century architecture and traditional tree-lined thoroughfares on your way to one of Charlotte’s award-winning soul food, BBQ or international restaurants. When the sun goes down, you’ll find plenty to keep you entertained at the NC Music Factory where you can discover some of the coolest bars, restaurants, pubs and live music set amid historic mill buildings. Located just a few blocks from your hotel is the EpiCentre, a dining and entertainment hub where restaurants and nightspots surround an open air pavilion with views of the Charlotte skyline. For those looking for a quiet place to unwind after a long day at the Snow Conference, Mecklenburg County is home to more than 210 parks located on more than 17,600 acres of land. All of this within walking distance or a short taxi, bus or trolley ride from the Snow Conference hotels!

Charlotte is also home to the NASCAR Hall of Fame, which will be hosting the Show for Snow’s Tuesday evening reception this year. The NASCAR Hall of Fame was built to honor the sport’s history, its moments and its best drivers while also functioning as a tribute to the sport’s passionate fans. You’re in for a full-throttle experience during this final evening of the 2013 Snow Conference. Enjoy food and drink while you discover three floors of NASCAR history and amazing artifacts. Get your adrenaline racing as you challenge your friends at more than 50 interactive experiences that will be available like the tire-changing stations, realistic racing simulators and broadcast booth. You’ll also have a chance to check out the Hall of Fame inductees, explore their

At the NASCAR Hall of Fame in Charlotte, N.C., the Glory Road mimics various degrees of banking at racetracks including the impressive 33-degree incline found at Talladega Superspeedway. Fans have the opportunity to walk on the surface and experience the high banks at 14 and 33 degrees. (Photo credit: ©Sean Busher and NASCAR Hall of Fame)
backgrounds and even cast your vote for the next Hall of Fame class. Whether you’re a history buff, a die-hard NASCAR fan or just looking to share the experience with your peers, you’re sure to be in for a night of pedal-to-the-metal fun!

Along with a great city and fun social events, the Snow Conference will offer outstanding education and exhibit programs at the Charlotte Convention Center.

The 2013 exhibit floor promises to be the best yet, with this year’s conference schedule providing more exhibit open hours for you to explore the floor and talk with the exhibitors that bring you everything you need to help keep the streets clear and your community safe when winter comes around. More than 120 companies will be showcasing everything from innovative new equipment and groundbreaking technologies to products and services focused on snow and ice removal, winter road maintenance, and streets and fleet operations.

The education program has been developed by a committee of APWA members and winter maintenance professionals, and it really delivers this year, with longer sessions and more variety. In addition to the usual Winter Maintenance and Weather presentations, we’ve added tracks for Emergency Management, Fleet, and Sustainable Winter Operations. This year’s Talk Show session is titled Public Works and Emergency Response. This interactive session will be led by a panel of experts from all across North America who will lend their experience and provide strategies on emergency management and incident command that you’ll be able to take back to your agency after the conference.

The Tuesday General Session will feature keynote speaker and NASCAR legend, Jeff Hammond. Jeff began his NASCAR career in 1974 working as a tire changer for Walter Ballard. After joining Cale Yarborough for three Winston Cup championship seasons and one more with Darrell Waltrip, he was promoted to the head crew chief position in 1982. As the old saying goes, “the rest is history”—Hammond set the sport on its ear, winning two more championships with Waltrip and amassing 43 wins as crew chief. Jeff now provides commentary for FOX, FX and the Speed Channel. Always entertaining, Jeff’s session will provide a unique perspective on success and how to overcome the obstacles you encounter each and every day.

Back by popular demand is the Winter Maintenance Supervisor Certificate Workshop, which made its premiere as a pilot program at the 2011 Snow Conference in Spokane. Designed for individuals charged with supervising their winter maintenance operations, this one-day workshop provides a well-rounded overview of all aspects of snow and ice control. Held on the first day of the conference, attendees enjoyed the Closing General Session at last year’s North American Snow Conference in Milwaukee.
conference, this workshop provides a great foundation for deeper investigation into specific topics of interest throughout the rest of the conference.

Our exhibitors have some knowledge to share too. There will be special 45-minute sessions in the Exhibitor Solutions Theater located on the exhibit floor. Presenters will demonstrate how their company’s technology or service provides a solution that addresses the needs of the snowfighting industry.

The conference ends on Wednesday with technical tours. Attendees will have the opportunity to choose between the Charlotte Street Maintenance Facility Tour, Freightliner Trucks Mount Holly Plant Tour or the Michael Waltrip Racing Shop Tour.

Charlotte Street Maintenance Facility Tour: The Charlotte Department of Transportation Northwest Operations Yard and Administrative Facility is a state-of-the-art facility, built in 2006. This tour will highlight the division’s snowfighting equipment, 5,000-ton salt storage building and its highly-effective salt brine manufacturing system with 10,000 gallons salt brine and 5,000 gallons calcium chloride storage capacity. Technicians from the City of Charlotte’s Fleet Management Division will be on hand to demonstrate the tools and equipment used to fight snow and ice on more than 5,200 lane miles of city roadway and maintain more than 6,200 pieces of rolling and non-rolling stock used throughout the city and county. This tour also functions as the hands-on supplement to the educational session “Biodiesel in Winter – What You Need to Know.” As an extension of that educational session, you will also be performing easy biodiesel testing that you can take back to work.

Freightliner Trucks Tour: This tour takes you to Freightliner Trucks’ Mount Holly Plant. Thanks to their more than 630,000 square feet of floor space and approximately 1,550 employees, the Mount Holly facility was recently able to celebrate the production of its 500,000th vehicle—a Freightliner Business Class M2. Opened in 1979, the Mount Holly Plant originally produced long-haul heavy-duty Freightliner trucks for customers in the eastern United States and Canada. Discover the major renovation and expansion that took place in 2002 that readied the plant for M2 production and allowed them to hit this historic milestone.

Michael Waltrip Racing Shop Tour: Located in Cornelius, N.C., the Michael Waltrip Racing Shop encompasses over 11 acres and more than 140,000 square feet of NASCAR excitement. Opened in 2007, the complex houses Michael Waltrip Racing’s three SPRINT Cup Series race teams: Clint Bowyer (#15 5 Hour Energy Toyota Camry), Mark Martin (#55 Aaron’s Toyota Camry) and Martin Truex Jr. (#56 NAPA Toyota Camry). During this tour, you’ll observe the inner workings of production such as the machine shop, shocks, suspension, gears and transmission, paint booth, fabrication and final assembly departments as technicians build the cars you see every weekend on TV. In addition, you’ll see short films throughout the tour that further detail the immense amount of work it takes to get these machines on the race track. Weather and schedule permitting, attendees can even watch a LIVE Pit Practice session. Following the tour, you’ll be able to visit the Team Store for a memento from your favorite driver to remember this one-of-a-kind tour.

Make plans now to attend the 2013 North American Snow Conference in Charlotte! You can find more information and register online at www.apwa.net/snow.
Building community and advocating for public works in the world of water resources management

Nikki Guillot
Professional Development Program Manager
American Public Works Association
Kansas City, Missouri

Where you find public works in the community, you’ll find water resources management: from Hurricane Sandy flood emergency response to the droughts that loomed over Missouri, contributing to roadway damage and utility exposure all the way to the water quality improvements in Tampa Bay’s rich estuary resources. As efficiency continues to drive the regulatory environment toward more integrated solutions to water resource conservation and management, these sectors of distribution, treatment and stormwater will converge as they do in many public works agencies. The Water Resources Management Technical Committee is working hard to connect the dots on this important part of our everyday lives in the articles that make up this issue of the Reporter, but that is only one component of their work plan.

The Water Resources Management Committee is on a mission to provide educational opportunities, information exchange and representation to our members across the U.S. and Canada. This is no small task for a group of six volunteers with full-time jobs in a wide range of fields from dam removal and flood control to utility management and private consulting from Maine to California, but this group is actively engaged in their mission and has made strides to bring value to each part of this mission for the benefit of our members and the public works community.

Through support to the infoNOW Community Forums and the careful selection of sessions for the reconfigured Stormwater Summit at Congress in Chicago, the committee has created a welcoming place to share information and learn about water resources practices in public works. The committee has also been working on a Click, Listen & Learn webinar session on water meter technology, the development of technical specialties in the Donald C. Stone Center for Leadership Excellence, and providing support to chapter-level Water Resources Committees. These activities help to grow the water resources management community within public works and enhance the professional expertise in APWA to achieve the goals of the committee.

While education and the exchange of knowledge is critical to the success of the committee’s efforts, perhaps their most ardent cause over the last year has been to represent public works in the water resources management community. This means tracking and reviewing legislation on funding mechanisms, commenting on draft regulations and working closely with the Government Affairs Committee to contribute Position and Guidance Statements that relate water resources issues like the safe disposal of pharmaceutical waste. All of these endeavors rely on the diligent efforts of APWA’s Washington, D.C. staff, who specialize in advocacy and keep their finger on the pulse of the capitol as it relates to public works issues.

As the Water Resources Management Committee looks ahead to an exciting spring meeting in Washington, D.C. and the direct representation they will provide in meeting with their congressional officials, each of them can take pride in their commitment to the mission of the committee, many of them over multiple terms of service, and we’d like to recognize them here for their contributions to the dynamic value APWA provides to all members.

- Paul Hindman (chair), Executive Director, Urban Drainage & Flood Control District, Denver, CO
- Mike Healy, retired
- Eric Labelle, Assistant Director, City of Portland, ME
- Deana Donohue, Director of Project Delivery, California American Water, Sacramento, CA
- Robert Nowak, Street/Stormwater Manager, City of Largo, FL
- Tom Hickmann, City Engineer/Assistant Public Works Director, City of Bend, OR
- Bill Spearman (APWA Environmental Director-at-Large), Vice President, Woolpert, Inc., Columbia, SC

Nikki Guillot is also the staff liaison to the Solid Waste Management Committee and the Facilities & Grounds Committee. She can be reached at (816) 595-5221 or nguillot@apwa.net.
A look back and a look forward

Mabel Tinjacá, Ph.D.
Director of Professional Development
American Public Works Association
Kansas City, Missouri

PWA’s Donald C. Stone Center recently celebrated its first-year anniversary with over 400 participants in the Leadership and Management programs. It seems obvious that the DCS Center was started at the right time, when the problem of deteriorating infrastructure and a renewed focus on community development are becoming more prevalent in the national discourse. We continue to be pleased that the credentialing program is without match and is filling a definite need in the public works community.

Through conversations with participants, we are mindful that the website can use improvements and we are actively working to provide candidates and their mentors with a friendlier experience. To compensate for the website’s shortcomings, we provide the best customer service possible. The DCS staff understands the importance of supporting candidates and mentors through the credentialing process, working with each caller to make sure questions are answered and problems resolved. Several improvements have been made based on participant suggestions. We are in the final stages of a new administrative tool which should make the website transactions happen much faster and software that allows us to access participant information more quickly.

The Mentor Forums that were implemented last November have improved communication with the Leadership Fellows and we are working on many of the issues that have been shared during the conference call forums. As a result of the forums, we have modified the Professional Development Plans and have updated the assessments. We are also increasing the number of questions in the assessment tools for Public Works Supervisor (PWS) and Public Works Manager (PWM) programs.

We are thankful for the public works professionals who support the DCS Center—they go over and above the services they provide their agencies, consultant firms and universities. Members of the Program Council have reviewed each and every application, spending a great deal of time discussing candidate applications and recommending alternative program levels. They are currently reviewing the entry requirements for the Public Works Executive (PWE) program; the revisions will be posted on the DCS Center website when finalized by the Program Council.

The Research Council has worked diligently to develop rubrics to evaluate capstone projects and develop processes to respond to inquiries about initial and final projects. They are currently preparing processes for oral exams; they are considering town hall and city council meeting simulations.

We are delighted by the mentors’ dedication to their mentees and the feeling of satisfaction that most derive from working with their mentees.

Public works attracts those kinds of professionals who feel a sense of responsibility to give back and believe that investing in the next generation of leaders is a worthwhile endeavor. We know this is an important part of making the program successful and improving the quality of lives of the communities they serve.

We are impressed by the candidates and their sense of responsibility despite having so many challenges and activities competing for their time as they fulfill their jobs and maintain balance with their personal lives. We see the critical thinking, resiliency, creativity and dedication that are the hallmarks of the public works profession.

It is hard to believe that we are now looking into the face of Year Two. We see the technical career paths taking shape. Each of the nine Technical Committees has begun working on the career paths. The Fleet Services, Water Resources Management, and Engineering and Technology Committees are currently reviewing the curricula APWA developed for the three certification programs—Certified Public Fleet Professional, Certified Stormwater Manager, and Certified Public Infrastructure Inspector. The certification programs represent a major investment for APWA and we believe they will be a significant contribution to the profession. We plan to grow the programs by developing career path pipelines leading to the certification exams.
A special task force is also working on a maintenance curriculum that will cut across public works disciplines. Unlike the other technical career path, this will be a horizontal path, allowing participants to gain skills and knowledge in maintenance across different functional areas in public works. Two agencies have volunteered to pilot this curriculum when it is ready.

The Emergency Management Committee is identifying available curriculum through the Federal Emergency Management Administration and the Emergency Management Institute to determine how these courses can be used in a career path format.

The institutes play an important role in the DCS Center, with existing and new institutes working to make the experience the best it can be. More chapters are developing institutes, including several in Canada. Partnerships among chapters and organizations that provide training programs to public works professionals are becoming more prevalent.

It goes without saying that DCS candidates are gaining valuable knowledge and experience from participating in the program. We are now working to create demand for the DCS credentials. With the help of the PWLFs and the Past Presidents Advisory Group’s (PPAG) Ambassador Program, we will begin promoting the PWS, PWM and PWE credentials directly to organizations. When city agencies, consulting firms and other public works-related organizations begin requesting the DCS credentials as part of the hiring and advancement processes—when they see these credentials as valuable or essential for talent development and retention—we’ll know that the program has been truly successful.

Recognize Your Leaders

Submitted by: Tom Hickmann, Engineer - Public Works, City of Bend, Oregon, and member, APWA Water Resources Management Committee; Nominee: Patrick Griffiths

In every community one of the most valuable assets is water. In the western U.S., water rights are incredibly complex, highly fought over, and require constant diligence to protect and maintain those rights. Those rights are the basis for water supply planning for communities, and this task is usually not recognized or seen. In fact, many within the public works profession are often unaware of these issues or what it takes to protect them.

In Bend, Ore., that task has fallen to a single person, Patrick Griffiths. Patrick came from being a middle school science teacher and was thrown into the water rights world. In fact, those who hired him were not even aware of the monumental task they had asked Patrick to take on.

When Patrick started, the City had protected only 0.4 MGD of its 20 separate water rights supply. This meant that the majority of the 67 MGD of water rights that the City held were at risk to numerous legislative actions, and even potential forfeiture. Patrick took on the responsibility of organizing the City’s numerous water rights and their basin-wide complexities. He developed a program to systematically identify each of the City’s rights, current status, and prioritization. Patrick’s leadership and ownership of this critical issue has resulted in the City now having the majority of the City’s water rights protected allowing the community to have a reliable water supply to develop the community and its economic engine. Without Patrick’s efforts, the City would be in a very difficult position and would be facing great uncertainty in its water supply future. We are thankful to have Patrick as part of our team and for his dedication to the water supply profession.

Patrick Griffiths

We look forward to establishing, building and growing a benchmark credentialing program. We will continue to work diligently to tackle the challenges of a startup program and meet the growing need for strong and talented public works leadership to take us into the next century in vibrant and healthy communities everywhere.

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Diversity made the national news recently. Did you catch it? Susan Rice withdrew herself as a potential candidate for Secretary of State. In response, on December 14, The Washington Post included an article titled “Rice’s withdrawal raises concerns about diversity in upper echelon of Obama’s next Cabinet” by Julie Pace. I don’t bring this up to start a political discussion, but to point out that diversity is in the forefront of the conversation these days. This means that everyone from your customers, to your employees, to your managers, is paying attention to the diversity of your organization. Now is the time to review the “diversity” of your organization, and if you have taken a look before, it is time to take a new look.

The article “The precessional effect of diversity in the workplace” by Jimmy B. Foster in the April 2012 Reporter did an excellent job of describing how cultures, groups, and even nature are improved by diversity. In his article, Foster referenced several studies on the positive impact of diversity, including an article from the April 10, 2006 issue of ScienceDaily that stated: “According to Tufts University, diverse groups perform better than homogenous groups when it comes to decision making and this is due largely to dramatic differences in the way whites behave in diverse groups—changes that occur even before group members begin to interact.” The bottom line is that diversity is important if an organization wants to perform at its best.

What is diversity? Before you can achieve a goal, you must define it. Here is a description from our own APWA Diversity Guide: “Diversity includes race, gender, creed, age, lifestyle, national origin, disability, personality, educational background, processing style, thinking style, energy level, assertiveness level, weight and height, values, political views, marital status, goals and ambitions, likes and dislikes, social status, income level, tenure within an organization, level of position within an organization, geographic origin, management vs. union, rural vs. urban, etc.” More simply, diversity means “differences in people.” How will your organization know when it has enough “differences” or diversity?

Diversity relative to your location: A good gauge to know if your workplace is “diverse” enough is to compare it to the diversity within your community. Each community is unique and the residents have different expectations for diversity in the businesses they work with. Just as residents in Houston, Tex., do not expect their municipality to have the same level of snowplowing preparation as Anchorage, Alaska, residents would not expect both cities to have the same diverse makeup.

When considering the diverse makeup of their surroundings, municipalities and businesses should take the time to check the uniqueness of specific neighborhoods within metropolitan areas. For example, The Kansas School for the Deaf is a cornerstone of Olathe, Kans., where I live and the population includes a significant number of hearing-impaired people even compared to other communities within the greater Kansas City area. As a resident, I encounter hearing-impaired people all the time: at the park, at the grocery store, at my place of worship, and even at home as my next-door neighbors are hearing-impaired. Organizations in Olathe that include hearing-impaired staff and have operations in place to serve hearing-impaired people not only better serve their hearing-impaired customers but meet the diversity expectation of the community at large.

Diversity starts with hiring: Once your organization has an idea of its diversity in the workforce goal, reaching or maintaining that goal starts with the hiring process. When advertising open positions, be sure to think about how to throw out the widest possible net. This could include placing notices in specific community newspapers/magazines or through their online job postings and participating in job fairs at local colleges as well as the larger ones. Before you even begin the interviewing, make sure that your organization appears to be welcoming to a diverse group of people. Look at your website. Does it show pictures of people of different ages, different ethnicities, etc.? If your business has a diversity committee, advertise it. The goal here is to not let any potential talent feel excluded but rather to let all potential job applicants know that your workplace is welcoming to all groups of people.

During the interview process, have job candidates meet a variety of people...
in your office. When more than one person is conducting interviews, make sure to have diversity in that team. Pay attention to visible and non-visible differences to keep from excluding potential talent. For example, if the interview team consists of four people representing more than one race and age group but all four attended the same college, mentioning that similarity to a potential job candidate that attended the same school could make her feel like part of the group. Likewise, if that similarity is mentioned during an interview with a candidate from a different school, he may feel like an outsider.

**Diversity in management:** Every organization strives to get the best talent on their team, including in management, to best serve their customers. However, back to diversity in the news, perception is everything when it comes to the “upper echelon.” For example, if your community is comprised of five different groups, but all of your managers are part of one group, your business could be missing the diversity it needs to best serve your customers.

Remember “The precessional effect of diversity in the workplace” article that stated “diverse groups perform better than homogenous groups when it comes to decision making.” Diversity in management can lead the way to making decisions that will allow your organization to perform at its best for all of its customers.

**Diversity in retention:** Once your organization has implemented plans hiring and promoting including diversity in the process, it is time to measure your effort. Be sure to track diversity details relating to the different groups who apply for jobs, are interviewed, accept job offers, are in your workforce, are promoted and are in management.

While it is good to track and know your workforce’s diverse makeup, a true measure of your success in diversity can be how well you retain employees from all groups. If you consistently retain people from certain groups but have high turnover in other groups, this discrepancy can indicate that your organization is not meeting the needs or addressing the concerns of certain groups. If you are not meeting the needs of a certain group within your organization, it is possible that you are not best meeting the needs of that group in your customer base.

Diversity training for management and employees and a diversity committee to address employee concerns can help your business increase or maintain its retention rates. If your organization already does diversity training or has a diversity committee, be sure to advertise these activities to customers, employees and potential employees.

**Diversity in conversations:** Diversity in your workplace will help you to best serve your diverse customers. How is diversity helping you think outside the box? In Olathe, we raised the railroad tracks and worked with the train companies to implement a “quiet zone,” in part due to our large hearing-impaired population. At-grade railroad crossings were noisy, traffic-stopping headaches that did not provide the safest situation for our hearing-impaired residents. By raising the rails, we eliminated the traffic stoppages, increased safety, and increased peace and quiet for everyone.

Diversity is imperative for the workplace and in decision making for organizations who want to best meet their customer and employee needs. What conversations are you having in your organization about diversity?

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Mention Al Capone and Elliot Ness and the movie *The Untouchables* comes to mind. Have you seen *Road to Perdition* starring Tom Hanks as a mob hit man? If you enjoy watching gangster movies, you may like to explore some inexpensive ways to recapture this era.

Although prohibition ended in 1933, some of these famous (or is it infamous?) sites that are reminiscent of these times still remain today. Some will cost you as little as your travel time and others can be enjoyed for the price of the “good stuff.”

Let’s start with the story of the “Lady in Red” and John Dillinger. Movie buffs will remember that Ol’ J.D. was a nasty bugger that Melvin Purvis, one of the famous “Untouchables,” wanted to bring to justice. The story has Dillinger being fingered by a dame at the Biograph Theatre and then dying in a gun battle with the G-Men. The Biograph Theatre (www.victorygardens.org) still exists and now hosts live theater and is located at 2433 N. Lincoln Avenue. It will be easy to recognize with its famous marquee.

For those wanting to tip back a few in a place that once was a genuine speakeasy, try John Barleycorn’s in Lincoln Park at 658 W. Belden Avenue. The story goes that Dillinger hung out here in the 1930s when the adjacent store was a Chinese laundry and served as a front where patrons entered. In order to avoid the attention of the “coppers,” laundry carts were used to haul in the “hootch.” It’s about a quarter-mile walk southeast of the Biograph Theater near the intersection of Lincoln and Belden. For those who love pub food, this is a place to enjoy.

To learn more about the gangster era and the roaring ’20s, head to the Chicago History Museum (www.chicagohistory.org) at 1601 N. Clark. You can get there from the Hilton Hotel by grabbing the No. 22 bus.

If you are into jazz, then the Green Mill is your place. This hot spot has been around about a century and was noted to be a place “Scarface” Capone himself hung out. Also, “Machine Gun” McGurn, who was rumored to be one of the gunners in the St. Valentine’s Day Massacre, was a part owner of the place. It’s located at 4802 N. Broadway. You may recognize it from the movies where it has served as a backdrop in several talkies. This is a true cocktail lounge with a cover charge and no food service, but some very good jazz.

For those looking to host some friends, or just looking for an entertaining dinner and a show, then you may want make a reservation at Tommy Guns Garage (www.tommygunsgarage.com), just don’t forget to ask for the password. This is a live dinner theater that spoofs the gangster days of the roaring ’20s. It is a bit pricey but a lot of fun. It’s located at 2114 S. Wabash, not far from the now-defunct Lexington Hotel located at Michigan and 22nd Street. The Lexington Hotel was Capone’s headquarters before he was shipped off to Club Fed for not paying his income taxes.

Chicago is home to a special blend of music known as the blues. This sound was brought to Chicago by the migration of African-Americans to the city. Buddy Guy, a popular Chicago artist, was just named as a Kennedy Center Honoree for his contribution to music. In presenting the award to this living legend, Academy Award-winning actor Morgan Freeman praised the guitarist for making “a bridge from roots to rock and roll.” Buddy is known as one of the finest electric guitar players.
Buddy Guy’s is a block west of the Hilton Hotel. The cover charge is fairly reasonable and you will save on cab fare with it being so close. For our international visitors, I hear their reception will be held here. Rumors are swirling that our young professionals might also be heading there. Hmmm, must be something they like. If you’re not part of those groups, don’t be blue, but you should take advantage of the location and grab a couple of pals and head over.

Chicago is no Gotham City, but it has served as the background for many films including The Dark Knight where the Twin Anchors bar was featured. Opened in 1932, this makes it one of the oldest restaurants in the city. Some of the Rat Pack hung out here including “Old Blue Eyes.” Yup, Frank Sinatra is known to have frequented this place when he was in town. It’s appropriately located in the Old Town Neighborhood. Direct your cabbie to 1655 N. Sedwick.

Joel Koenig is a Senior Project Manager with Crawford, Murphy & Tilly, Inc. He is serving as a member of the Chicago Chapter Congress 2013 Steering Committee. He may be reached at (312) 357-2075 or at jkoenig@cmtengr.com.

Chicago is famous for its blues and hosts an annual festival in the summer to celebrate this music genre. (Photo courtesy of choosechicago.org.)
ike many public works departments throughout the Northeast, Lexington DPW is responsible for maintenance at its historic cemeteries. There are three historic cemeteries in Lexington: Ye Olde Burying Ground (the gravesite of Captain Parker who led the minutemen on the Lexington Battlegreen in 1775); Munroe Cemetery (which still has an occasional burial and is home to a Medal of Honor recipient); and Robbins Cemetery (an old family burial lot). Each is home to Revolutionary War and Civil War veterans, each has varying types of grave markers, and each is unique in importance and maintenance needs.

For many years the historic cemeteries only received the basic maintenance of mowing, trash pickup and leaf cleanup. Historic cemeteries were not maintained to provide a well-manicured and landscaped setting like a park, but rather to provide a more natural appearance and feel for visitors. Little thought was given to the actual condition of the grave markers. The prevailing practice was to let the cemeteries age naturally and not repair damaged grave markers unless it was due to vandalism. We had a combination of grave markers that had deteriorated and broken naturally and some that were tipped over, moved or broken by vandals.

In 2008, as Lexington began thinking about its 300th Celebration scheduled for 2013, the historic cemeteries began to take on more significance in the community. Walking tours were developed that included these cemeteries and more attention was given to the condition of the grave markers. Many were broken, cracked, covered in moss or in the wrong location. This was not acceptable for a Town like Lexington that prides itself on its rich history.

After meeting with the Lexington Historical Society and the Board of Selectmen, Lexington DPW was able to secure funds for a conservator to perform a conditions assessment of all the grave markers at each of the three historic cemeteries. Each grave marker was catalogued, photographed, given a conditions assessment and given a treatment recommendation. The conservator, Building Monument Conservation, then developed plans and specifications for the needed work. The total cost estimate for repair and conservation of the grave markers at all three cemeteries was approximately $370,000 and was broken out into three phases. Town funding could not support this and we had to look at other funding sources in order to accomplish this important and much-needed work.

As the conservator was performing the grave marker assessments two things happened that would affect funding for this project. Grant funding across the state was being reduced which limited the amount available. What little funding was available from grants was not worth the time and effort needed by staff to apply. At the same time the Town of Lexington passed the Community Preservation Act (CPA). This Massachusetts Law which each community can adopt or not adopt allows for an additional tax to be levied for up to 3% of the assessed property value. The funds collected are placed in a separate fund and can only be used for historic preservation, open space (which now includes recreation areas) and low-income housing. It was decided to pursue this funding option and see how much of the project we could do before 2013.

Ye Olde Burying Ground
The project was presented to the Community Preservation Committee (CPC) which was formed to oversee and administer the CPA. The CPC felt that the Historic Cemetery Conservation Project met the criteria for historic preservation and should be funded at the full $370,000. Presentations were then made to the Capital Expenditures Committee and the Board of Selectmen. Both of these groups endorsed the project and it was brought before Town meeting and approved for funding in the spring of 2009. This project would not have been successful if not for the cooperation and collaboration of the Lexington Historical Society, the Lexington Tourism Committee, the Lexington Historic District Commission and the Lexington Department of Public Works. The citizens of Lexington also gave their support to restoring and conserving a valuable historic resource in the Town.

The project was put out to bid and we retained the services of Building Monument Conservation as our project manager. Although we received the full funding for the entire project we decided to implement the project in the three phases we had originally developed. This was a better approach so we could logically perform the repairs and conservation and keep the project manageable. To date we have performed Phase 1 and Phase 2 which addressed rebuilding tabletop markers and resetting, repairing and cleaning hundreds of grave markers at each of the three cemeteries. The project has since been expanded to include gazebo and storage building restoration, fence restoration and tomb restoration. All of the important work needed for the 300th Celebration has been completed. We anticipate the remaining work under Phase 3 to be undertaken in the spring of 2013.

The Town has received many compliments on the restoration and conservation work. The community has taken renewed pride in these valuable historic assets and as a by-product vandalism has declined. Our staff now has an understanding of the important and significant role that the historic cemeteries play in our community and they also take great pride knowing that they maintain these assets. Due to the success of this project we have been able to secure additional CPA funds for the implementation of a master plan at the Lexington Battlegreen and surrounding historic areas for restoration and preservation work. This was also a collaborative effort between DPW and various boards and committees in Town.

The valuable lessons learned on this project were to identify critical assets in the community, assess what needs to be done to maintain, repair and preserve these assets, explore multiple funding sources and, most importantly, form partnerships with various stakeholders and decision makers to ensure a successful project from start to finish.

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“\textit{It is the duty of every cultured man or woman to read sympathetically the scriptures of the world. If we are to respect others’ religions as we would have them respect our own, a friendly study of the world’s religions is a sacred duty.}”

\textbf{– Mohandas K. Gandhi (1869-1948), political and spiritual leader of India}
A trio of the City’s snowplows will look particularly festive on the streets of Raymore this winter, thanks to the students and art teachers at Creekmoor Elementary, Bridle Ridge Intermediate, and Raymore-Peculiar East Middle schools.

Inspired by an article in the American Public Works Association’s APWA Reporter trade magazine about students decorating city snowplow blades, Public Works Director Mike Krass thought it sounded like a fun idea for Raymore and offered the city’s nine snow blades to area schools for student beautification.

In early October, Raymore Public Works staff prepped its snow blades with a new base coat of paint before delivering one to each of the participating schools, encouraging the students to channel their inner Rembrandts on the 10-to-11-feet-wide, metal blade fronts.

A month later, the plow blades had been transformed from drab to fab, with each remodeled into a mobile mural reflective of the students’ artistic talents and school spirit.

While Erin Miller’s art students at Ray-Pec East Middle took inspiration from Van Gogh’s “Starry Night” masterpiece, Bridle Ridge’s “Snow Plow Club”—consisting of 10 of art teacher Wendy Farley’s sixth-grade artists—opted to showcase the school on its plow blade with snowy lettering and a friendly snowman.

Jessie Cartwright’s entire fourth-grade class, numbering roughly 100 students, also chose a school spirit theme for its snow blade project. Working in teams during their morning art classes, the students donned oversized paint shirts over their coats and went to work outside, painting Creekmoor Cougar paw prints in the school’s colors across the blade.

Once the finished blades were back at the Public Works facility, staff applied a clear coat protectant to hopefully extend the life of the students’ artwork, once the plows are pressed into service clearing roadways during snow events, and possibly bring a smile to someone’s face passing by.

“For years, I have wanted to take our art into the community and provide a creative experience for the kids beyond our school walls,” said Cartwright. “When I was in school, our art class had the chance to go around our city and paint fire hydrants in honor of the Bicentennial; some of us still talk about it. This kind of experience stays with the kids for a long time.”

“The students were very, very excited to be a part of this project,” added Farley. “It was really fun to do and we are hoping to continue our talents by painting a winter scene on the windows of our building next. I’m pleased with the outcome and extremely proud of my students.”

For the inaugural offering of the plow painting program in Raymore, Krass is pleased with the results.

“I think the kids did a great job and had a good time,” said Krass. “Hopefully, we’ll get even more participation in the program next year.”

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Creekmoor Elementary’s completed plow blade, decorated in black, blue and white, honors the school’s colors and cougar mascot.

A quintet of Raymore-Peculiar East Middle School art students paid homage to Van Gogh’s “Starry Night” with a wintry overlay.

The entire fourth-grade class at Creekmoor Elementary, nearly 100 in number, donned oversized “paint shirts” during their morning art classes and took turns adding their individual touch to the plow blade.

Wendy Farley, Bridle Ridge Elementary’s art teacher, chose to participate in the plow painting project because she felt it was a great opportunity for her students to get involved in community service. Farley hopes plow blade decorating will become a tradition at her school.
Building relationships and partnerships

Laura A. Kroeger, P.E.
Assistant Manager, Design, Construction and Maintenance Program
Urban Drainage and Flood Control District, Denver, Colorado
Member, APWA Leadership & Management Knowledge Team

Why are the keynote speakers at a conference for stormwater managers talking about relationships? Michael Brown, former director of the Federal Emergency Management Agency (FEMA), focused his keynote speech on the importance of professional relationships. He shared accounts of how emergency responses were influenced by whether or not direct relationships had been established with key individuals. For example, prior to the Katrina disaster, Mr. Brown had never met the Governor of Louisiana or the Mayor of New Orleans. The effect of not having developed these relationships was revealed during the critical hours leading up to the storm when neither the Governor nor Mayor took the time to respond to Mr. Brown’s calls. This resulted in valuable experience and resources not being utilized during a catastrophic disaster.

At the same conference, John Burke, P.E., Senior Engineer with the City of Westminster, Colo., delivered a presentation entitled “RFP – Request for Personalities,” in which he discussed a public works manager’s quest for consultants who possess an interpersonal awareness as a complement to their requisite engineering expertise. Mr. Burke humorously concluded that the greater the personality of a consultant, the more projects they will likely win. He encouraged engineers to not only focus on providing a high level of service, but also to reach out to clients to make those personal connections.

Additionally, the passing of Stephen Covey last summer prompted me to revisit one of his more famous works, *The Seven Habits of Highly Effective People*, and not surprisingly, the importance of relationships was at the heart of his message.

The idea of relationship-building has been well covered in both literature and management and leadership classes. Unfortunately, maybe so much so that we no longer clearly hear the message or give it much additional thought. How many of us make an intentional practice of nurturing existing relationships, in addition to seeking out new ones?

The word “intentional” was purposefully added to the previous sentence. Some professional relationships develop organically as the involved parties share professional interests or personality traits. These situations can help to make the act of forming and maintaining relationships seem very easy. Yet, it is likely that these types of relationships are in the minority of our professional relationships. Our remaining relationships are intentionally developed and will likely require a more strategic approach to create and maintain. The word “intentional” is included to emphasize the need to plan ahead, to anticipate situations, and to identify those who are most likely to be of assistance to you, as well as those to whom you may be able to be of assistance. You don’t want to find yourself in a position as Michael Brown was and not be able to get your message to the right people at the right time.

So how do we motivate ourselves to network, though we know that it may...
require putting ourselves in unknown or even uncomfortable territory? The key is recognizing that while the development of strong relationships will take desire and a continued investment of time and energy, the benefits will far outweigh the effort. On a personal level, these meaningful interactions can provide us with a sense of place or accomplishment. When much of our day is filled with meetings, e-mails, and phone calls, it is not uncommon to feel like we haven’t really accomplished anything substantial. If, however, we view the time we invest in meetings, responding to e-mails, and returning phone calls as an opportunity to foster, develop, and nurture important relationships, the result is often a feeling of fulfillment and meaning.

Another fundamental benefit to building strong relationships is what Stephen Covey refers to as the “emotional bank account.” As relationships develop and mature, we make deposits by showing integrity, trustworthiness, and sincerity. The significance of this bank account is that it also allows for withdrawals. At some point our relationships may become stressed. If there has been enough of a sincere investment in the relationship, recovery or rebuilding may be possible. If not, even a simple forgotten returned phone call can have significant negative ramifications.

An important result of investing in relationships is that it demonstrates the value you place on the relationship and, subsequently, the individual. We are part of what has at times been described as a thankless profession, yet we work with people every day who continuously give their best efforts to make our communities safer, cleaner, and more informed. What better way to convey our gratitude than by letting our staff and coworkers know their work is noticed and appreciated? Another example is showing our citizens that they are valued as well. Oftentimes, people just want to know that somebody is listening. Although there may not be an immediate solution to their concern, they know they are being heard and their opinion is valued. When a citizen feels valued, it can change the tone and direction of their call in a very positive way. I work with a construction manager who makes it a point to win over the loudest critic at the start of each new project. He gladly invests time at kitchen tables talking about family, what the neighborhood used to be like, where to get the best sandwich, and, eventually, the specifics of the project. More often than not, when the project is complete, the person who started as the critic is writing letters to the City Council praising the project and the efforts of all involved.

Hopefully this is enough motivation to start building meaningful relationships. Many books have been written on this subject so there is no need to go into great detail, but I have found the following two principles to be very successful. The first is to listen, listen again, and then listen some more. The better we understand the position, goals, and concerns of someone, the easier it is to find the common ground that will connect us.

The second is to say what you mean, and mean what you say. Be transparent and consistent. It is important to not have a hidden agenda, but rather, to be straightforward in your communication. When you are direct with others they will treat you in the same manner. We are not in a business that benefits from “playing the game.” Difficult decisions need to be made, tough conversations need to be had, and the work needs to get done. This happens most effectively and efficiently when we communicate honestly, openly and consistently.

Strong professional relationships provide countless resources, which enable us to be more effective in our jobs. They take time, energy, and personal commitment, but the rewards will be tenfold, so be intentional! Think of the difference it can make at the start of a new project to identify the key community leaders.
and reach out to them personally. This new relationship helps the project team identify the true needs and concerns of the community. It also provides the opportunity to bolster the “emotional bank account” as all projects have missteps. Community leaders make the best project advocates and help seek buy-in from the residents and elected officials.

As Michael Brown emphasized during his keynote speech, a successful result to emergency response efforts is crucial to our communities. When faced with an emergency, to whom is your first call? Who do you trust as reliable sources of information and to whom do you need to pass that information? Are those relationships established? Will your call be taken?

Make your list and start reaching out today. Be intentional in developing and maintaining relationships that will help you be a more effective leader in your organization.

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For more information about these programs or to register online, visit www.apwa.net/Education. Program information will be updated as it becomes available. Questions? Call the Professional Development Department at 1-800-848-APWA.

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“Sustainability is a condition of existence which enables the present generation of humans and other species to enjoy social well-being, a vibrant economy, and a healthy environment, and to experience fulfillment, beauty and joy, without compromising the ability of future generations of humans and other species to enjoy the same.”

– Guy Dauncey, Canadian environmentalist
International Federation of Municipal Engineers

Doug J. Drever, P.Eng., FEC, Project Director, City of Saskatoon, Saskatchewan, and member, APWA International Affairs Committee; Chris Champion, CP Eng., Chief Executive Officer, Institute of Public Works Engineering Australia, and member, APWA International Affairs Committee

The International Federation of Municipal Engineers (IFME) is a federation of member organizations with similar objectives to the American Public Works Association (APWA) and the Institute of Public Works Engineering Australia (IPWEA). IFME comprises member countries that include the United Kingdom, The Netherlands, Sweden, Finland, Norway, Belgium, Denmark, Estonia, Italy, Israel, South Africa, Botswana, Namibia, Zimbabwe, New Zealand, Australia, Canada and USA. Iceland is planning to join our federation in the next year as well. APWA joined IFME in 2011 and will be holding the International IFME Conference in North America in the year 2018 in conjunction with our APWA Congress.

IFME is also a collaboration that allows the international public works community to share innovation. Where else would I have learned about innovation and creativity; as I saw an underground public works facility in Helsinki, a vacuum system for collecting trash in Sweden and a proposed new underground wastewater treatment plant in Finland. We also toured an innovative land development project in New Zealand that has canals for direct access to the ocean.

IFME had its beginnings in 1960 when the inaugural Assembly of the Federation took place at the UNESCO Headquarters in Paris. It is a federation open to professional municipal engineers and public works professionals through their own national municipal engineering associations.

The inaugural event in Paris followed a two-year preparatory phase during which contacts were developed between the national societies of municipal engineers of Belgium, France, Great Britain and the Netherlands. The idea of grouping municipal engineers from different countries was conceived by the French and the Belgian Associations of Municipal Engineers in 1957.

One of the key objectives of IFME is to encourage technical and cultural exchange between municipal and public works engineers worldwide. International exchange of information, innovation, skills and experience are even more important in today’s global world than when the Federation was first formed over 52 years ago.

An international exchange is an enriching experience on many levels. It affects both personal and professional development, stimulates creative ideas, enhances relationships, and strengthens multicultural understanding. The benefits of international exchange, learning and understanding cannot be underestimated. In Finland, four members of APWA joined with our friends from Australia and New Zealand to learn from our Finnish partner organization that prearranged a three-city tour that was featured in the October 2012 issue of the APWA Reporter. Not only did we learn about the technical aspects from our Finnish partners, but our relationship-building with the Kiwis and Aussies is lifelong and I have continued to learn from our Southern Hemisphere friends.

IFME’s mission is to connect municipal engineers and public works professionals, public agencies, organisations, institutions and businesses around the world in order that they share a global pool of knowledge and experience. The aim is to foster continued improvement in the quality of public works and wider community services.

IFME experiences the same problems as many voluntary professional member organizations: lack of resources. For an international organization this is significantly compounded by distance but e-mail, the Internet and teleconferencing are opening up new opportunities.

Just as our own professional organisations provide valuable networking opportunities for our members, there is also a need to increase opportunities for international networking (and understanding). As with our own professional associations, and membership, it is also not just what you can benefit from membership—but also what you can contribute.
The IFME Board held one of its biannual meetings in Boston, immediately before the 2010 APWA Congress. This was a significant meeting for IFME, as much of the two-day meeting was spent on strategic planning; the results of which will unfold over the next 5-10 years. The IFME Board will be revisiting our Strategic Plan in Charlotte, N.C., at APWA's North American Snow Conference in April which the Board is looking forward to learning about snow operations.

At an operational level, we are working from a highly successful World Congress in Helsinki, Finland, in 2012 towards our next Congress in Rotorua, New Zealand in 2015. This triennial event is the IFME World Congress on Municipal Engineering. Our aim is to encourage strong involvement from both member and nonmember countries all over the world. This will hopefully also be the introduction of some countries becoming new members of IFME and growing the international community of public works and municipal engineering. The 2015 Congress in New Zealand website is: http://www.ifmeworld.org/home.php.

As well as planning the World Congress, IFME will be encouraging interchange and exchange between our member countries as much as possible. IFME will be establishing an up-to-date list on its website of when and where various national public works conferences are held around the world. This may lead to opportunities for our individual members to attend conferences if they are planning personal travel to one of our many member countries.

An awareness and understanding of differing cultures is also important in maximizing the benefits of international communication and exchange. Public works professionals need to look/see/assess and consider if what is working in one country will work in a different cultural environment. Culture, expectations and our local environment have a way of dictating the approaches we take to solving public works problems.

Despite advances and opportunities to develop and exchange ideas and technical knowledge, it still seems that we have a lot to learn and understand about the way of life, cultures and customs of other countries. The hope is that IFME can be successful and expand its membership so that it can also contribute to friendship amongst nations, and a peaceful progressive sustainable world.

The advent of e-mail and the Internet is improving communications internationally. International travel is more accessible to many. And in municipal engineering and public works, the many issues we face in our day-to-day jobs are not that dissimilar across the globe.

My two years as an IFME Board member has revealed just how common the many challenges are that public works employees face. It has also been very comforting to be able to quickly make so many new friends from across the globe. It always seems that this is the case with our “brother and sister” public works colleagues no matter which country they come from. We obviously have many common interests!

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Improving water quality is a growing concern in communities throughout the country. To address this concern, municipalities are focusing attention on stormwater runoff. Stormwater runoff results from rain or melted snow that is not absorbed into the ground. The excess water concentrates and forms waterways ranging in size from small streams to large rivers. If left untreated, stormwater runoff will lead to the pollution of drinking water sources, lakes, bays, and oceans. Impervious surfaces such as concrete, roofs, and roadways from urban developments increase the amount of runoff and yield a wide range of pollutants with potential to enter nearby waterways. In order to minimize pollution, municipalities must rise to the challenge of leading their communities in finding innovative and cost-effective methods to effectively treat stormwater.

Quality of life and environmental impacts are fundamental reasons why water quality is a top priority for municipalities. Damage to the environment and the loss of valuable water resources negatively affect the entire community. Municipalities themselves will be at risk of serious fiscal impacts, including fines, costly retrofit projects, repairs, and increased costs to treat drinking water if stormwater quality is not properly addressed. Federal regulations such as the National Pollutant Discharge Elimination System (NPDES) are catalysts for municipalities to create stormwater quality programs. In order for municipalities to improve water quality, they must dedicate sufficient resources towards developing and implementing comprehensive watershed protection and management plans.

**Why should public works departments take the lead?**

Public works is the most appropriate entity to lead the charge in stormwater quality. Public works departments typically operate and maintain stormwater management facilities in the community. Public works departments possess equipment, personnel, and expertise that can be efficiently incorporated into a stormwater quality program. Public works is also closely involved in the review and approval of new developments and redevelopments, which provides them the opportunity to regulate proposed infrastructure and require improvements as warranted.

Public works departments have the resources to overcome typical challenges that arise in the course of creating and implementing a stormwater quality plan. For example, new and unproven treatment devices will present technological challenges. Since public works will be responsible for maintaining these devices, they will be the most appropriate department to test and evaluate the devices. Public works is responsible for administering capital improvement projects which in turn equips them with the tools to overcome economic challenges arising out of the need to construct projects and in some cases purchase right-of-way to accommodate the proposed projects. These are just a few examples why public works should lead its community towards improving water quality.

**What can your department do to lead the community?**

A stormwater quality plan will guide public works and the community towards improving water quality in the region. Creating a stormwater quality plan is a detailed process with several directions a department can go in order to create and implement a successful plan. The following guidelines provide a foundation for public works departments looking to build a stormwater quality plan.

**Strategic Planning.** A strategic plan is a long-range planning document that will guide the public works department and provide assurance that future improvements will work synergistically in order to achieve desired goals. Strategic plans should at a minimum include the following information:

- Citywide mission and goals
- Program milestones
- Affected watersheds
- Environmentally sensitive areas
- Menu of acceptable BMPs
- Roles and responsibilities

When preparing a strategic plan, municipalities must build flexibility...
into the document. Producing a flexible strategic plan will provide the department the ability to make changes as needed when implementing the plan.

**Self-Evaluation.** Once a strategic plan has been created, a detailed self-evaluation of existing resources should be conducted to identify where additional resources are needed in order to implement a stormwater quality plan. The self-evaluation should study all departments as well as any agencies such as a flood control district, which operate within the municipality’s watershed area. Existing resources can then be measured against federal regulations and community goals in order to identify deficiencies and opportunities to collaborate with other departments, or outside agencies. Understanding what resources are already available will aid departments in developing a comprehensive plan to meet the goals of the strategic plan. A self-evaluation will also eliminate the needless waste of resources and increase the speed in which public works departments can reach stated goals.

**Create Policies and Standards.**
A stormwater ordinance is required in order to identify roles and responsibilities as well as other key components of a stormwater quality plan. In addition to the ordinance, public works departments are encouraged to create standards to (1) simplify design for developers and capital improvement projects, (2) create uniformity throughout the community, and (3) simplify maintenance by standardizing permitted treatment devices. When creating standards, departments must take the necessary steps to involve all stakeholders. Stakeholders’ input will help the public works department create standards that will work best for the entire community.
Public Outreach. Public works departments will need to involve the community early in the planning process. There are many stakeholders throughout the community, and each will have their own goals and objectives. For this reason it is best to include them as early as possible in the planning process. Holding public hearings may meet minimum requirements, but it is not enough to create a successful program. Public works departments need to go out into the community to capture the stakeholders’ attention and request their input. At a minimum staff should attend homeowner’s association (HOA) meetings, hold town hall meetings, and send out mailers.

Political Support. Political support is critical for an undertaking as monumental as creating a stormwater quality plan. Elected officials need to be educated about the importance of properly addressing stormwater quality. They must understand how the proposed plan will benefit the community as a whole. Once elected officials have a solid grasp on the importance of addressing stormwater quality, the public works department can educate them on the proposed plan. A timeline detailing when the department expects to reach critical milestones will be a useful tool for illustrating how the department will work towards achieving the stated goals. Costs should not be a discussion point until after elected officials understand the importance of addressing stormwater quality. Elected officials can easily be deterred if they focus solely on costs rather than the needs of the community.

Train Staff. Water quality requirements and technologies are constantly evolving, thus it is important to encourage staff to attend training courses and seminars discussing stormwater quality technology and new or proposed legislation. This will ensure staff is
knowledgeable about current and future requirements to keep the municipality in compliance with federal regulations. Attending these types of seminars may also lead to opportunities for staff to work with manufacturers of proprietary devices to install demonstration projects in the community. These demonstration projects will provide valuable hands-on knowledge and experience maintaining the proprietary devices. Staff will be able to monitor and evaluate the devices to determine whether the municipality will benefit from using them throughout the community. Several municipalities including Portland, Ore., Philadelphia, Pa., and South Burlington, Vt., have already developed successful stormwater quality programs and can serve as models for others creating a stormwater quality program.

**Funding.** Stormwater fees are a popular approach towards funding a stormwater quality plan. Fees must be identified in an ordinance in order to make them enforceable. Special assessment districts are another alternative for funding specific projects. Special districts encompass the area that will benefit from the proposed projects and the costs of the projects are spread amongst the property owners over a specific number of years. Non-monetary funding opportunities are available but require municipalities to be creative in identifying them. For example, a strategic plan adopted by the city council will empower public works to condition developers to construct improvements and dedicate right-of-way as a part of the development process. Developer improvements or dedicated right-of-way will reduce the amount of funding the municipality will need to expend, thus freeing up funding for other projects.

**Conclusion**
Municipalities must consider the negative effects stormwater runoff can have on the community if it is not treated properly. Public works departments are well suited to treat stormwater runoff and reduce these negative effects. Public works departments possess many of the tools required to adequately address stormwater quality; therefore, they must step forward to create and implement a stormwater quality plan for the community. Creating and implementing such a plan will require public works departments to work in partnership with all of the stakeholders in the community. Although stakeholders may have varying goals and objectives, the public works department will need to keep everyone focused on the overall goal of protecting the environment and maintaining the quality of life throughout the community. The guidelines discussed above will guide public works departments towards creating and implementing a successful stormwater quality plan that will accomplish these goals.

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Future-proofing our utilities by reestablishing the human connection to water

Graham Symmonds, P.Eng.
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Global Water Resources
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Water has always defined the human landscape. Since the dawn of humanity, civilization has been bounded by the spatial and temporal availability of water. The massive engineering works associated with civilizations such as the Egyptians, the Romans, the Hohokam, and the Maya inspired our own nineteenth- and twentieth-century responses to the age-old conundrum of getting water to the populace. The abundance of water and ultimately the availability of cheap power to move it finally decoupled humans from our most important resource.

However, this decoupling has actually re-exposed the water reality on Earth: while the amount of water in the Earth system is constant, it varies in quality, location, access, delivery, and availability. In fact, the distribution of fresh water is extremely disproportionate, with eleven countries sharing approximately 60 percent of the world’s freshwater resources,¹ and 450 million people in twenty-nine countries suffering from chronic water shortages.²

And the problem will continue to be exacerbated by population growth, continuing urbanization and increasing volatility of our natural water supplies. In the last century, the world’s population has tripled, and is expected to increase from 6.5 to 8.9 billion by 2050. Asian cities alone are expected to grow by one billion people in the next 20 years. Globally, changes in atmospheric temperature are driving an increase in the volatility of the water cycle, with wet places getting wetter leading to more severe and more frequent flooding, and dry places getting drier meaning longer and more intense droughts.³

How are we, then, with a finite and increasingly fickle water resource, a burgeoning population and continued urbanization, to quench the thirst of society? The answer lies in regaining the knowledge of how, where and when we use water so that we can make conscious, informed decisions. The beauty of this path is that it not only extends our water resources, but extends the useful life of our water infrastructure, future-proofing our cities.

Availability of Data
Our twentieth-century water systems are not designed as data-rich enterprises. In many places water is unmeasured, and where it is, arbitrarily-assigned annual, semi-annual, quarterly or monthly reads are insufficient to allow a consumer to recognize the “water impact” of
their decisions, let alone the financial impact.

Advances in technology are rapidly changing that paradigm. Advanced Metering Infrastructure (AMI) can provide reads at near real-time intervals for consumers. For the first time, consumers can access consumption data that they can connect to their choices. In addition, these technologies allow utilities to push that information to the consumer in a proactive way. For example, immediate high usage alerts allow the consumer to correlate their activities such as draining and refilling a pool, or lawn overseeding, to their water bill. The availability of this data reinforces the meaning of water for the consumer, but it also reduces the inevitable call to the utility: “I could not have possibly used that much water!”

**Consumer Benefits of Data**

The benefit of data in behavioral change is critical. But this level of information is also imperative as costs increase. As the cost of water increases to be noticeable in the budgets of consumers, consumers will demand an understanding of not only what they are paying for, but how to control their costs.

As a result of scarcity and volatility, increasing regulation, the requirement to replace aging infrastructure and an overall increase in the costs of providing service, the cost of water is increasing. *American Water Intelligence* reports that water and wastewater rates increased an average of 8.1% between July 2010 and July 2011. In fact, “price inflation is persistent and pronounced for water and sewer services,” and the result has been that the costs of water and sewer services have increased at a rate of twice the Consumer Price Index for decades (Figure 1).

Increasing price certainly makes people more aware of their usage. When prices increase, city council chambers and public utility commission hearing rooms are packed with concerned consumers. For those in charge of raising prices—city councils, utility commissioners and utility managers—a key message to impart to consumers is that while prices are increasing, tools exist to allow the individual consumer to effectively and proactively manage their consumption and costs. Equally important is the message that by conserving resources, consumers are extending the useful life of existing infrastructure and deferring the necessity for new capital investment, dramatically reducing future increases in the cost of water.

For the consumer, access to highly granular, time-relevant data, means an understanding of water use and results in dramatic changes in consumption. With access to this data, subtle societal pressures are reinforced and the utility can nudge the consumers’ fundamental understanding of water and their use.

Through data, the consumer can begin to make conscious decisions on water use. A recent study completed by California State University found that through the provision of instantaneous feedback on water consumption, average water consumption reductions in the order of 14 percent can be achieved. By invoking a little competition into the mix, even more is possible. Robert Cialdini, a psychologist at Arizona State University, recently noted: “People don’t recognize how powerful the pull of the crowd is on them. We can move people to environmentally friendly behavior by simply telling them what those around them are doing.” This is echoed by Paul Ormerod, a London-based economist, who commented: “Throughout history, a crucial feature of human behavior has been our propensity to copy or imitate the behaviors, choices and opinions of others.”

**Impact of Real-Time Data and Electronic Billing**

Global Water embarked on increasing the data availability to consumers in our seven utilities (sixteen public
water systems) in 2004. Since that time, we have seen that with access to information, people will make changes to their water use, with reductions in consumption from 8.8% to 18% as consumers adapt (Figure 2).

But more interestingly, the method of receiving that data may also play a role in conservation. Consumers opting for electronic billing and data presentment are actively reducing their consumption, in some cases by as much as a third (Figure 3).

**Infrastructure Benefits of Data**

Every time consumers conserve water, they effectively extend the life of our systems. Conservation leverages existing infrastructure to serve future needs. Because water infrastructure typically scales linearly with population,

10 demand reduction can be translated into direct availability for new consumers and into significant capital expenditure savings. As demonstrated in a recent CERES report, this “found capacity” means that more customers can be serviced with the existing resources and the life of the civil infrastructure can be extended (Figure 4).

**Conclusions**

For utilities, the twenty-first century will see the continued convergence of water scarcity and financial pressures. Reengaging the consumer in their water use through data presentment and access cannot only allow utilities to combat water scarcity, but can also significantly extend the life of existing facilities.

To be successful, water managers of tomorrow will need to manage the flow of data and information as equally well as the flow of water. Our future depends on it.

For more information on using data to engage consumers and extend the operational life cycle of infrastructure, please visit www.gwfathom.com, or call 1-855-FATHOM1.

Graham Symmonds, P.Eng., is the Senior VP of Regulatory Affairs and Compliance and Chief Technology Officer for Global Water Resources. He has a degree in mechanical engineering from the University of Toronto. He has spent the last 17 years in a variety of utility engineering, operations and executive roles after having served for nine years as a Marine Systems Engineering Officer in the Royal Canadian Navy. He can be reached at (623) 580-9600 or graham.symmonds@gwresources.com.

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1 Gleick, P., “The World’s Water 2008-2009,” Table 1: Total renewable freshwater supply by country (2006 update), Pacific Institute, 2009; Brazil (14.9%), Russia (8.2%), Canada (6.0%), USA (5.6%), Indonesia (5.2%), China (5.1%), Colombia (3.9%), Peru (3.5%), India (3.5%), Congo (2.3%), Venezuela (2.2%)


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**Figure 2: Impact of Data on Consumption**

**Figure 3: Choosing E-billing Reduces Consumption**
Figure 4: Extending the service life of infrastructure


4 American Water Intelligence, “Tariff Survey: Cities hike water charges as financing options evaporate,” September 2011


7 Schultz, W., DeCianni, W., and Roldan, A., “Water Conservation Pilot,” research report, California State University, San Marcos


APWA is proud to bring the 2013 Show for Snow to one of America’s prominent Ice Belt cities – Charlotte, NC! With a variety of winter weather events occurring in the Ice Belt annually, and even as far south as Dallas and Atlanta in recent years, it’s important to remember that winter maintenance is more than just snow removal.

With that in mind, the 2013 North American (Not Just) Snow Conference promises to be the best yet! Sit in on one of the many outstanding education sessions, featuring the very best in snow and ice control along with an expansive lineup of fleet and emergency management solutions to fit your needs. Don’t miss your opportunity to visit the exhibit floor, where you’ll have an opportunity to network with peers as you discover the industry’s latest cutting-edge technologies, equipment and processes you need to help keep your community safe next winter!

**Sunday, April 7**

**Exhibit Hours:**
4:30 – 7:00 p.m.

7:00 a.m. – 4:30 p.m.  
Winter Maintenance Supervisor Certificate Workshop

1:00 – 4:30 p.m.  
Education Sessions

4:30 – 7:00 p.m.  
Exhibit Opening & Welcome Reception on the Exhibit Floor

**Monday, April 8**

**Exhibit Hours:**
9:00 a.m. – 3:30 p.m.

7:30 – 9:30 a.m.  
General Session Talk Show: Emergency Management

9:30 – 11:10 a.m.  
Coffee Break & Non-Compete Exhibit Time

9:40 a.m. – 3:15 p.m.  
Exhibitor Solutions Theater Presentations

11:10 a.m. – 12:00 noon  
Education Sessions
Register today and join us in Charlotte for the Show For Snow!

Tuesday, April 9

Exhibit Hours:
8:00 a.m. – 2:00 p.m.

8:00 – 8:50 a.m.
Education Sessions

8:50 – 10:10 a.m.
Coffee Break & Non-Compete Exhibit Time

9:00 a.m. – 12:15 p.m.
Exhibitor Solutions Theater Presentations

10:10 – 11:00 a.m.
Education Sessions

11:00 a.m. – 1:00 p.m.
Lunch & Non-Compete Exhibit Time

1:00 – 3:15 p.m.
Education Sessions

3:30 – 5:00 p.m.
Closing General Session: Jeff Hammond, Keynote Speaker

6:30 – 9:30 p.m.
Reception at NASCAR Hall of Fame

Wednesday, April 10

8:00 a.m. – 12:00 noon

Technical Tours:
Tour #1: Charlotte Street Maintenance
Tour #2: Freightliner Trucks
Tour #3: Michael Waltrip Racing Shop

Sunday, April 7

Exhibit Hours:
4:30 – 7:00 p.m.

7:00 a.m. – 4:30 p.m.
Winter Maintenance Supervisor Certificate Workshop

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General Session Talk Show: Emergency Management

9:30 – 11:10 a.m.
Coffee Break & Non-Compete Exhibit Time

9:40 a.m. – 3:15 p.m.
Exhibitor Solutions Theater Presentations

11:10 a.m. – 12:00 noon
Education Sessions

12:00 noon – 2:00 p.m.
Lunch & Non-Compete Exhibit Time

2:00 – 2:50 p.m.
Education Sessions

2:50 – 3:30 p.m.
Refreshment Break & Non-Compete Exhibit Time

3:30 – 5:00 p.m.
Education Sessions
Stormwater quality and quantity solutions: green infrastructure best management practices

Larry Morris, P.E., Director of Engineering & Utilities, City of Aiken, S.C.; Cal Sawyer, Ph.D., Associate Director, Center for Watershed Excellence, Clemson, S.C.; and Bill Spearman, P.E., Vice President, Woolpert, Inc., Columbia, S.C., and APWA Director-at-Large, Environmental Management

Aiken, S.C., is a very interesting small city in the sand hill area of South Carolina. The city was established in 1835 as a stop along the Hamburg to Charleston railroad line. The 136-mile journey from Charleston (through Aiken) and on to Hamburg was the first successful scheduled railroad service in America. It was also the world’s longest railroad at the time it was completed in 1833. The city was laid out with a geometric street system that included 150-foot-wide boulevards or parkways. Today, Aiken’s boulevards help distinguish it from many other quaint southern towns. The City has meticulously maintained these boulevards that have numerous blooming plants and trees, and the boulevards are a source of pride for the city’s citizens.

The downtown portion of the City of Aiken (Figure 1) covers approximately 1,200 acres and is comprised primarily of commercial and retail establishments with some residential units. The downtown area is part of the historic preservation district and is characterized by its parkways, landscaped medians, and pedestrian-friendly shops and dining establishments.

Below the downtown area lies Hitchcock Woods, an area encompassing approximately 2,100 acres of forested resources and one of the largest urban forests in the United States. This area is comprised mostly of mature forests and is used primarily for horseback riding, hiking, and other recreational pursuits. The Sand River flows through the Woods property, from its origin at an existing stormwater outfall pipe located below South Boundary Street to its outfall at Dibble Road.

The Problem

The most obvious and highest priority problem was the erosion of the Sand River within Hitchcock Woods. The volume and velocity of the runoff associated with the city’s drainage has resulted in severe erosion of the stream banks and adjoining properties. This erosion also threatens several large sanitary sewer lines and recreational uses, and transports significant amounts of sediment into downstream wetland areas. The velocity of the storm flow as it enters the Sand River is due in part to the elevation difference between the upstream watershed (downtown Aiken) and the discharge point. The high density development and size of the drainage area also contribute to the problem. The discharge also contains the typical pollutants common within a downtown urban environment.

Since 1991, five different engineering and consulting firms have prepared studies and plans to address the stormwater issues within the Sand River watershed. The latest report, completed in 2009 by the Clemson University Center for Watershed Excellence (CWE), reevaluated several possible alternatives, including alternatives which were proposed in the earlier studies. The CWE effort included several public meetings to receive input on the various alternatives. Although there are several erosion and potential
water quality issues in and around Hitchcock Woods due to the stormwater discharges, the most prevalent and pressing issue is in the headwaters of the Sand River. Over the last several decades, stormwater discharges have eroded the channel in the upper reach of Sand River, leaving behind deep cuts. Long-time citizens reflected that the drainage way that would become Sand River could be jumped across and did not resemble the 40-foot and deeper cuts that exist today.

**The Solution**

Prior reports and watershed studies prepared for the City of Aiken compared alternatives through engineering evaluations and cost analysis. Many factors were considered in the evaluations including various construction aspects, the runoff that could be diverted, the runoff that would remain in the Sand River, and the overall effectiveness of each alternative on the main problem areas. After considering these aspects, the latest study by the Clemson University CWE concluded that the most appropriate solution is to extend the existing 10-foot diameter pipe further downstream, install erosion protection measures at the pipe outfall, provide onsite green infrastructure (GI) best management practices (BMPs) in the upper watershed, and restore Barton’s pond. This conclusion involved several factors including constructability and cost, impact on resolving the highest priority issue (erosion control), the project budget, and water quality concerns.

The use of GI BMPs was determined to be the most effective means to control runoff from the downtown area and improve water quality in the basin. Due to funding and other constraints, Phase 1 of the Sand River Improvement Project only included the installation of GI BMPs in the downtown area of the city. The placement of bioswales or bioretention cells (BRC), pervious pavements, and proprietary stormwater management practices were designed to provide the greatest enhancement in water quality, while causing the least amount of disruption in this thriving downtown area. These areas were thoroughly examined as part of this project, and construction plans and permits were developed to implement the suggested improvement program utilizing field changes.

The City was able to utilize green infrastructure funding through the American Recovery and Reinvestment Act of 2009 (ARRA) to support the design, construction, and post-construction monitoring components of the project.

**Monitoring Results**

The Clemson University CWE research faculty, working in partnership with the City and the design consultant, developed a set of robust objectives to monitor and evaluate installed green infrastructure practices. Several research-focused objectives included: (1) quantification of hydrologic flows, pollutant concentration, and loading of representative BMPs in response to storm events; (2) assessment of GI BMP design, installation, and maintenance; and (3) optimization of site-level remote data acquisition capabilities and integration of associated collection, transmission, display, and archival into the Intelligent River® network.

Though unpublished, preliminary research findings suggest installed green infrastructure practices are addressing the site-specific hydrologic and hydraulic challenges. For monitored bioretention cells (BRC), empirically-derived stage-discharge relationships indicate infiltration is occurring efficiently and, in many cases, no storm-related discharge is occurring into the city’s storm sewer system. Using event mean concentration, BRC discharge data also suggest load reduction for several important water quality parameters, including suspended sediment, total phosphorous, nitrate-nitrogen, and heavy metals. Using ASTM C1701,
porous asphalt infiltration rates range from 484–786 in/hr, with an average infiltration rate of 616 in/hr across all monitored locations. Further, monitoring well data collected within the leveling course and open-graded base show that with minor rainfall events, no storage occurs within the reservoir course. With heavier rain some storage occurs, but then drains rapidly within 1-2 hours. More complete performance results will be published within the peer-review scientific literature in the near future.

Associated Outreach and Education Opportunities
In June 2012, the Center for Watershed Excellence partnered with the City of Aiken to offer a Design & Implementation Technical Workshop and an Educational Field Day in Aiken to highlight preliminary results and provide important information to interested parties. The event was sponsored by the USDA-NIFA Southern Region 406 Water Quality Project. The workshop on the first day addressed site design techniques and implementation practices in support of green infrastructure for the City of Aiken. The content of the technical workshop was tailored for professional engineers, landscape architects, stormwater managers, and agency personnel and offered professional development hours. On the second day, the public and news media were invited to attend faculty presentations and an open forum to learn more about the project components and technology. On both days, attendees toured the reconstructed parkways to view the innovative best management practices and research instrumentation. Presentations and photos from the event are available at www.clemson.edu/watershedcenter/aiken_green.

Lessons Learned
The Aiken Urban Retrofit Project provides a real-life example that GI BMPs can be installed in a downtown area with minimal disruption to the merchants and use of the parkway areas for festivals and enjoyment by the citizens. However, working on retrofit projects in a downtown area required more flexibility in the development of construction plans due to working around utilities, specimen trees, and maintenance of traffic. Success required close cooperation between the City, the contractor, the engineer, Clemson University researchers, and the other project participants.

For more information, contact APWA Top Ten recipient Larry Morris at (803) 642-7610 or lmorris@cityofaikensc.gov.
NATIONAL
PUBLIC
WORKS
WEEK MAY 19-25, 2013
BECAUSE OF PUBLIC WORKS...
Tracking Hotspots: Using ArcGIS to improve Mooresville’s sanitary sewer system

Alan Saine
Civil Engineer
Town of Mooresville, North Carolina

In 2010, the Town of Mooresville, N.C., began experiencing a rise in the number of sanitary overflows and sewer stoppages. The reason for the problem was evident: the Town of Mooresville has over 6,000 manholes and 250 miles of sanitary-sewer gravity-main lines; only 30 percent of that infrastructure has been constructed in the last 20 years. In addition to aging infrastructure, the Town of Mooresville population has tripled in the last 20 years, thus putting more strain on significantly aged sanitary sewer system.

Mooresville, like most municipalities, has permit requirements that are regulated by Division of Water Quality, a division of the North Carolina Department of Environment and Natural Resources. One of the requirements is that the permittee shall assess all cleaning needs, and develop and implement a program appropriately cleaning all sewer lines. The Mooresville Water Sewer Maintenance Department (WSMD) manages this requirement on a day-to-day basis and recently requested the assistance of Town’s Engineering Department to help them determine all the distressed spots, or “hotspots,” in the system in order to more strategically and effectively clean and maintain the system. Fortunately, the Engineering Department had recently finished a year-long project, which employed Esri’s ArcGIS software, to locate, map and input all the features of the Town’s sanitary sewer system.

“Economic growth kept our staff very busy for years with installing all of the water and sewer taps,” said Jamie Johnson, Water/Sewer Maintenance Field Supervisor. “Since the growth slowed due to the recession, we had to move from a reactive approach to being proactive. In the past, crews would alternate cleaning sewer lines in whatever area they wanted to and areas were being
left out. By restructuring crews, we dedicated a crew to do all of the line cleaning and with this continuity we were able to grasp the needs of our wastewater collection system.”

In order to assist the WSMD in identifying distressed spots on the system, the Engineering Department needed to pinpoint these locations on a map and assign date(s) for when the sewer feature(s) (manholes, sewer main) were cleaned. The WSMD maintained monthly data, from August 2009 to January 2011, of where and when the sewer cleaning occurred in Microsoft Excel spreadsheets. Each spreadsheet contained the cleaning data for that month as well as a unique identifier, Manhole ID (MHID), to capture the location. Once the spreadsheets were reviewed, it was decided that Python scripting would be an optimal way to process the batch of Excel format cleaning data and generate a comprehensive dataset.

Automating with Python
Creating the cleaning data would require the repetition of several steps; this process was simplified by using Python. The Python script was developed so that the user would have the Excel file in a folder on their computer and they want to extract the month and MHIDs from it and then perform several analyses. The Python script was also saved into a custom ArcToolbox so that any user could access it using ArcMap.

This map is an example of the red-yellow-green scheme that displays the frequency of how often that line has been cleaned in the 18-month span.
The first step was to create the cleaning data. This was done by creating a join between the MHID in the Excel file and the MHID in the Town’s ArcGIS SDE database. A copy of cleaned manholes was created and all intersecting sewer lines to cleaned manholes were selected and copied. Simple reports were also created utilizing the Arcpy function in Python. An example of this, the ArcGIS Analyst Frequency Tool to was used to calculate the number of sewer mains and their length that were cleaned that month.

Once the cleaned sewer mains were created, the process was repeated for the next month’s data. After the monthly cleaned sewer mains data was created, the data was merged together into one layer and the frequency of how often that line has been cleaned was calculated and coded using a red-yellow-green scheme. Hotspots, or areas that had been cleaned seven or more times, were displayed as red so it would be evident where there were issues.

**Locating the Cleaning Hotspots**

Through the Python automation, it was easy to use ArcMap to display all the cleaning data, which were symbolized using green, yellow and red to represent the frequency which the lines had been cleaned. The ability to map where the sewer cleaning was occurring and how often it occurred yielded some interesting results. There were over a dozen separate areas where the sewer mains had been cleaned 7-12 times in an 18-month span. This information became a catalyst for improved interdepartmental communication between the WSMD and the Town of Mooresville Fat Oils Grease (FOG) Department.

“Our sewer cleaning map has helped us to identify those areas that require more frequent inspections and increased pumping/cleaning frequencies for food service establishments,” said Jamie Levis, FOG Compliance Officer. “The use of ArcGIS has helped the FOG staff identify and remedy problem grease interceptors (problem spots) on multiple occasions. With the use of this tool, what used to take weeks now takes minutes to look up and identify.”

**Fixing the Hotspots**

Mapping the hotspots gave the WSMD and FOG Department specific areas to target and improve. Several methods were used to investigate these areas, such as closed-circuit television (CCTV) of the sewer mains and inspecting all the oil/water separators in the vicinity of the sewer cleaning hotspot. Several problems were fixed by simple root control treatments and locating grease violations by local restaurants.

Prior to this project being implemented, in 2010, the WSMD did not know where the “hotspots” were and did not have a way to track areas that were being repeatedly cleaned. In 2010, the Town cleaned 51 miles of sewer mains. Of those cleaned sewer mains, 58% of them had already been cleaned earlier that year. In 2011, after the project, the Town cleaned 144 miles of sewer mains and only 32% of them were repeats. By having the ability to identify hotspots and correct issues, the Town was able to clean almost three times more and cut the repeat trips by 26%. “Since our productivity has increased, we...
have noticed a decrease in main-line stoppages and after-hour callbacks resulting in cost reductions including less overtime pay for employees,” Johnson said. “This has also resulted in less service interruptions to the customer and less of an impact on surface waters caused from overflows.”

Ryan Rase, Deputy Town Manager, also praised the results of the project: “The WSMD has not been immune to the downturn in the economy; we are constantly being asked to do more with less. Through the use of technology and teamwork we were able to provide a tangible example of how the WSMD has been able to become more efficient.”

Next Steps – Going mobile
Today the Town continues to map the sewer cleaning, but using Esri ArcGIS app, workers can now use iPads to log cleaning data directly into the system from the field (instead of keeping track of Excel spreadsheets). The sewer cleaning crew can instantly view where the cleaning truck has been in the past two years and be strategic in cleaning by maximizing the route of the cleaning crew and migrating to areas that need attention. Additionally, they can easily identify hotspots that show up red on the map and communicate where customer intervention may be needed. This project created a proactive approach to maintaining the Town sewer system and enhanced interdepartmental communication.

“This project has ended up being a model to the entire Public Services Division of how through the use of technology both time and money can be saved,” Rase said. “The WSMD employees have recognized this and now are bringing ideas to Engineering so they can be implemented in such areas as valve exercising, CCTV, and inflow and infiltration repairs. We look back now and wonder how we ever survived without it.”

Alan Saine is a Civil Engineer and Engineering Intern at the Town of Mooresville in North Carolina. He is a graduate of the University of North Carolina at Charlotte and is currently pursuing his Masters in Geospatial Information Science and Technology at North Carolina State University.

At the Town, Alan recently finished implementing an enterprise GIS system in the Public Services Division. He is a member of URISA, is currently working towards his GISP and plans to sit for the Professional Engineering Exam in 2013. He can be reached at (704) 799-4064 or tsaine@ci.mooresville.nc.us.
How to turn federal mandates into community amenities

Green infrastructure can help you become a public works hero

James Schlaman, P.E., Engineering Manager, Black & Veatch, Kansas City, Missouri; David Koch, P.E., Client Director, Black & Veatch, Chicago, Illinois, and Grand Rapids, Michigan

As aging infrastructure crumbles, costs skyrocket, and unfunded federal mandates are enforced, public utilities face a barrage of challenges from every angle. Managers frequently must do more with less. Rate increases are required to address a lack of adequate funding, while ratepayers complain about the cost of services and balk at new bond issuances to fund federally mandated improvements.

For public utility managers facing wet weather—combined sewer/sanitary sewer overflow (CSO/SSO)—consent decrees, there’s an answer. To create leverage with the regulatory agencies and goodwill with stakeholders, public works leaders increasingly turn to green infrastructure.

Green infrastructure refers to an integrated network of centralized and decentralized environmentally responsible wet weather management systems. They are focused to mimic natural processes and return an urban area to pre-development hydrologic conditions. Typical examples of green infrastructure include:

- Vegetated swales
- Detention basins

By reducing and attenuating the amount of stormwater runoff entering a collection system, green infrastructure can be incorporated in wet weather programs to reduce overflows and complement and downsize traditional solutions such as storage tanks, high-rate treatment facilities, and deep tunnels. Key environmental benefits include:

- Surface water quality enhancement
- CSO/SSO source reduction and control
- Drinking water supply protection
- Energy demand reduction
- Green-collar job creation
- Public support for improvement projects

Additionally, green infrastructure has the advantage of being visible to the public and can be used to help create public amenities, including:

- Recreational amenities
- Natural habitat protection
- Reclaimed park land
- Increased property values

The United States EPA recognizes their value and has recently directed its regions to consider green infrastructure as part of a community’s holistic and integrated wet weather solution plan. Cities are already leveraging green infrastructure into consent decree/order-driven programs negotiations and implementation strategies. In such cases, stakeholders receive tangible and visible returns from user fees beyond buried pipes and unseen infrastructure.

Identifying the Universe of Green Infrastructure Opportunities

Consent programs are driven by compliance schedules; it is essential to meet deadlines and key milestones to achieve compliance. To effectively incorporate green infrastructure into an ongoing program, a community therefore must quickly and efficiently identify green solutions.

Thanks to the use of modern-day geographic information systems (GIS), identifying and prioritizing sites for incorporating green infrastructure has never been faster. Overlaying community data such as terrain, vegetation, soil type, and property ownership, enables use of GIS tools to provide the detailed information needed to select the best-suited, lowest-cost sites for green solutions across an entire city.

GIS-based green infrastructure locators developed for Omaha, Neb., and St. Joseph, Mo., enabled each city to identify and select the highest value sites for incorporation of green infrastructure. Publicly-owned locations were prioritized as “best value” green infrastructure.
opportunity sites because they didn’t require expensive land acquisition. Maps showing best-value opportunities provided both cities with a prioritized framework for locations where green infrastructure could be incorporated as part of their stormwater management and mandated wet weather programs.

Implementing Community-Based Wet Weather Improvements
Once the universe of green opportunities is identified, ongoing design projects can flesh out details for incorporating green infrastructure to achieve multiple benefits. As one example, the City of Omaha has established a green configuration for stormwater retrofits throughout City-owned parks that have detention basin facilities. The Omaha detention basin retrofits typically consist of the addition of a wetland and/or sediment forebay along with a detention basin expansion and improvements. The green retrofits

Cities like Omaha can create community amenities in the process of addressing wet weather mandates through effectively planned green infrastructure. (Credit: Black & Veatch)

The City of Grand Rapids constructed a stormwater infiltration basin in Joe Taylor Park. (Photo Credit: Black & Veatch)
allow the stormwater facilities to store and infiltrate more stormwater which help meet the wet weather mandate but also serves to support more community amenities.

“Our overall goal in Omaha is to achieve the requirements of the Clean Water Act in the best interest of its ratepayers,” said Omaha CSO Program Manager Jim Theiler. “To that end, the City is currently working with the EPA Office of Water and the EPA Office of Research and Development to help define how and when to utilize green infrastructure in a cost-effective way.”

The Omaha concepts have included urban fisheries, recreational areas for boating/kayaking, community gardens, a connection to the City’s walking and bike trail system, and learning areas for residents to better understand the goals of the wet weather programs. Community stakeholder meetings are held regarding each proposed plan to ensure that citizens have the opportunity to provide input and ensure their monies are being spent wisely and in a way that maximizes the plan’s value to the community.

As a second example, Grand Rapids embarked on a CSO program beginning in the late 1980s; implementation of that plan thus far entails an infrastructure investment total of more than $240 million. Over the years, the scope of the improvements has evolved as sustainability has gained momentum. The general scope of the sewer separation consists of replacement of aged combined sewers with separate storm and sanitary sewers, including replacement of water and other utility infrastructure and street improvements.

In recent years, evaluation and implementation of green infrastructure opportunities have enhanced projects in alignment with city-wide goals. Work has included coordination of sewer separation improvements with area transportation and land-use characteristics, evaluation of potential bike lanes, and enhanced support of pedestrian, vehicular, and bus traffic. These neighborhood improvements have attracted new businesses to the area while facilitating water quality protection; benefits have accrued beyond the important reduction of flows to the stormwater system and filtering of contaminants.

A majority of the green infrastructure components in Grand Rapids have been incorporated within the public right-of-way, which eliminates the need for purchasing
Green infrastructure facilities constructed in Grand Rapids to date, which include bioretention/infiltration areas like the one pictured here, improve stormwater quality and reduce the quantity directed to the collection system and river. (Photo credit: Black & Veatch)

property or obtaining easements. On occasion, property has been acquired to incorporate items such as community gardens, rain gardens and parks. Green infrastructure constructed to date includes hydrodynamic separators, underground infiltration basins, pervious pavements (both concrete and asphalt), and traffic circle and bulb-out bioretention/infiltration areas. Use of these sustainable approaches has improved stormwater quality and reduced the quantity directed to the collection system and ultimately the Grand River. Another design feature of the sewer separation projects is narrowing existing roadways where feasible to increase the amount of grass parkway; this has increased infiltration and decreased overland flow on impervious surfaces.

Integration of green infrastructure into the design of the public right-of-way supports other City sustainability goals, including roadway enhancements for multi-modal transportation. Some of the stormwater-related green infrastructure—such as traffic circle and bulb-out bioretention/infiltration that collect road-surface runoff and calm traffic—provides natural beautification.

The City worked with American Rivers to develop Green Infrastructure Portfolio Standards (GIPS) as part of an EPA Grant; the CSO program green infrastructure components were part of one of the GIPS demonstration areas. Local Calvin College students are currently evaluating the impacts of the improvements. These efforts will result in development of a handbook that other communities can utilize to develop portfolios.

“These green infrastructure improvements have been well received by the City’s Environmental Services Department and environmental groups around the area,” said Assistant City Engineer Jeff McCaul. “The first flush of water from a storm is normally the dirtiest, and these items reduce runoff going to the Grand River and its tributaries.”

Maximize Opportunities and Lead Your Utility to a More Sustainable Future

Utilities and communities in the United States and around the world are beginning to recognize the importance of incorporating green infrastructure into their planning initiatives and portfolios. Communities and utilities that face a mandated, consent-decree/order-driven wet weather program should seriously consider using green infrastructure to create additional community amenities, provide tangible benefits to stakeholders, and expand CSO/SSO controls negotiation or implementation strategies for environmental, economic and social enhancement opportunities. In short, cities that incorporate green infrastructure create opportunities.

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Tampa Bay Estuary “Road to Recovery”

Robert C. Nowak
Streets/Stormwater Manager
City of Largo, Florida
Member, APWA Water Resources Management Committee

Tampa Bay is an over-400-square-mile water body, bordered by three counties, that is located on the west central coast of Florida. The largest open water estuary in Florida, Tampa Bay has over one hundred freshwater tributaries that flow into its waters carrying nutrients and phytoplankton essential for its complex marine food web. Although much of Tampa Bay has been altered by development, sporadic sections of natural shoreline are still present as well as numerous mangrove-blanketed islands. These remnant systems provide a rich diversity of habitats for both flora and fauna.

Over 200 species of fish make a home or are seasonal to the Bay. Year-round residents include highly desirable game fishing species such as redfish, snook and spotted sea trout. When the waters grow cooler in the fall and winter months, migratory fish including Spanish mackerel and bluefish move into the waters of the Bay. When the waters begin to warm in the spring and summer months, tarpon are frequently found running the many channels, bridges and passes of Tampa Bay.

Tampa Bay is well known for year-round recreational game fishing, pleasure boating, sailing, jet skiing and kayaking. You can also take a sightseeing cruise and observe several species of “charismatic megafauna” such as the playful bottlenose dolphin, lumbering Florida manatee (sea cow), and hovering sharp-eyed osprey foraging in the waters of the Bay.

The 1950s through the 1970s saw a significant population growth in the Tampa Bay region. This in turn brought about a boom in the home building industry. The once prevalent farm and pasture lands slowly vanished and in their places came residential subdivisions, apartment complexes, condominiums and golf courses.

This growth spurt changed the composition of the lands in and around the Bay region. The new development included many new green lawns and golf courses that had to be maintained with fertilizer that was rich in nitrogen and phosphorus. This in turn introduced nutrient loads that far exceeded the once-normal loads observed from the natural...
undisturbed lands historically found surrounding Tampa Bay. In addition, the population growth increased the discharge of partially treated sewage into the waterways that flowed into the Bay. This increase in nutrients led to algal blooms and growth of chlorophyll-$a$ which slowly began to cloud the once-clear waters of Tampa Bay. The cloudier water decreased the amount of sunlight that penetrated the water column, affecting the growth of submerged aquatic vegetation, or seagrass, growing on the bottom of the shallow waters of the Bay. By the early 1980s nearly 50% of the seagrass had been lost within the Bay. This loss began a domino effect leading to the overall degradation of the waters within Tampa Bay.

The turning point for the recovery of Tampa Bay and its estuaries occurred in 1978 with the passing of the Grizzle-Figg Act (Florida Statute 403.086). The Act targeted “point source” pollutant-producing industrial complexes such as wastewater treatment plants, regulating the discharge of effluent water that interred the Bays. The implementation of this legislation began to slowly increase both the water quality and clarity of Tampa Bay. As a result, the Bay improved with reduction of nutrients at the loading point sources and significant changes were starting to be seen by the mid-1980s.

However, by the late 1980s it was realized that the Grizzel-Figg Act was not going to restore water quality in the Bay alone, so the Tampa Bay Estuary Program (TBEP) was established in 1991. The goal of the TBEP was to assist government agencies and other stakeholders in developing and implementing plans to sustain the recovery of the Bay. The TBEP also developed a Comprehensive Conservation/Management Plan, which was initially adopted in 1996 and has since been updated in 2006.

Among the top priorities in the recovery of the Tampa Bay Estuary was to reduce the microscopic algae in order to promote sunlight thus promoting the growth of seagrass. In 1996, the TBEP joined the Tampa Bay Nitrogen Management Consortium to create a public/private partnership to develop protective nutrient load targets for the Bay. The goals of the partnership were as follows:

- Creation of a resource-based management plan to restore/preserve seagrass
- Achieving chlorophyll-$a$ and a nutrient reduction plan
- Meeting the nutrient reduction target
- Monitoring water quality to assure seagrass growth

In 2002, the Florida Department of Environmental Protection approved the Tampa Bay Nitrogen Management Consortium nitrogen management plan that provided assurances to meeting water quality standards within Tampa Bay. The Consortium now has 40 stakeholders actively participating and working with the Florida Department of Environmental Protection (FDEP) and EPA to assure that the protective estuarine nitrogen loads are established and maintained.

As a public entity, the City of Largo is one of the stakeholders in the Tampa Bay Nitrogen Management Consortium. As part of the public outreach program the City has installed informative disks on all of its storm drain inlets within its jurisdiction. The disks inform the public that what goes into the

Map of Tampa Bay and the rivers and streams that feed the Bay and its estuary
system ends up in the Bay and also provides a telephone number to report illegal dumping in the system. In addition, the staff of Streets and Stormwater, a Division of the Public Works Department, all have their Florida Stormwater Association Stormwater Level One and FDEP Sediment and Erosion Control certification. The staff is also trained to spot illicit discharges or dumping into the city’s many open or closed stormwater drainage systems. If a violation is observed, staff reports to the department’s stormwater maintenance coordinator who will respond by either educating or issuing a notice of violation to the violator per City ordinance. As a further management process, the prevailing city and county municipalities that contribute stormwater runoff into Tampa Bay have all adopted Fertilizer Ordinances that limit the sale and use of fertilizers containing nitrogen and phosphorus.

There have also been several volunteer groups established that focus on projects designed to bring back the health of the Bay and its estuaries. In the fall of 2011 alone, 214 volunteers worked 856 hours cleaning up shorelines and replanting restored estuaries with native salt marsh species. Florida residents can also purchase “Tampa Bay Estuary” automobile licenses plates, at an added cost, with the proceeds going towards grants to fund projects to rebuild the estuaries. The first tags were available in 1999, and to date, has generated approximately 1.1 million dollars in grant funds.

On a personal note: As a teenager that moved to the Bay Area in the 1960s, I could get on my bicycle and ride 15-20 minutes and be at a great spot for fishing or crabbing. Upon returning to the area after my military service in the early 1970s, I witnessed the near collapse of the Tampa Bay ecosystem. Areas once rich with fish and bird species were now virtual dead zones. As an avid fisherman, I noticed a reduction in the population of spotted sea trout, redfish and snook.

In the mid-1980s, as a result of the Grizzle-Figg Act, I started to see improvements with the clarity of the water and noted that seagrasses were returning to some of my old favorite fishing spots. As the years have followed I have continued to see increases in both flora and fauna in Tampa Bay, all evidence that the efforts of the local, state and federal regulatory agencies are working.

So, thanks to the Grizzle-Figg Act, Tampa Bay Nitrogen Management Consortium and the many scientists, engineers and volunteers who have worked tirelessly on saving the Bay, the waters of Tampa Bay are close to making a full recovery to be enjoyed year round!

Bob Nowak is a first responder with over 40 years of public service. An avid fisherman and camper, Bob can be reached at (727) 587-6718 or rnowak@largo.com.
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Dam Removal Project: A new beginning for the Carmel River

Richard Svindland, P.E.
Vice-President of Engineering
California American Water
Sacramento, California

The San Clemente Dam is located nearly 18.5 miles from the Pacific Ocean on the Carmel River just downstream below the confluence of the Carmel River and San Clemente Creek in Monterey County (as shown in Figure 1). The 106-foot-high concrete arch dam was constructed in 1921 with a design storage capacity of approximately 1,425 acre-feet. The San Clemente Dam (shown in Figure 2) was originally built to provide drinking water to the residents of the Monterey Peninsula. The dam is owned and operated by California American Water (CAW).

Project Background
Today, just over 90 years after construction of the arch dam, the structural integrity of the San Clemente dam is failing, considered by dam experts to be seismically unsafe, and the reservoir no longer has sufficient storage capacity to provide sufficient drinking water for the residents of the Monterey Peninsula.

The California Department of Water Resources (CDWR) Division of the Safety of Dams determined that the structure could potentially fail in the event of either the maximum credible earthquake or maximum probable flood and issued a safety order for the dam structure in the early 1990s.

Over the years, the reservoir has slowly filled with more than 2.5 million cubic yards of sediment, leaving a reservoir storage capacity of approximately 70 acre-feet. Due to the reduced storage capacity, water is no longer diverted from upstream of the dam resulting in impacts such as impaired access for steelhead spawning and rearing habitat, disruption of sediment transport to the lower river and Carmel River beach, and ecological discontinuity of aquatic and riparian habitats.

In an effort to restore the structural integrity of the dam, CAW had originally planned to reinforce the dam to survive a severe earthquake
or flood. However, a standard dam buttressing project evolved into an unprecedented public-private partnership to disassemble the entire dam, reroute the river behind it, and restore the area to a natural habitat not seen in more than 90 years. Regulatory compliance would be achieved and the expense of disposing of the massive quantities of sediment that have filled more than 90 percent of the dam’s reservoir would be minimized.

The vision of restoring this steelhead habitat to resemble a pre-dam condition prompted a variety of groups—including local, state, and federal agencies—to work with CAW to devise a workable solution for removing the dam.

**San Clemente Dam Project Alternatives**

In 2006, CDWR released a Draft Environmental Impact Report/Environmental Impact Statement (EIR/EIS) for the original San Clemente Dam Seismic Safety Project that evaluated five alternatives for addressing the safety issue, including the dam strengthening and the Carmel River Reroute & San Clemente Dam Removal options.

Strengthening the dam structure would resolve the public safety issues but would not address the environmental concerns. For this reason, the California State Coastal Conservancy, as the lead for the State of California, the National Oceanic and Atmospheric Administration’s (NOAA) National Marine Fisheries Service, and the Planning and Conservation League Foundation worked with CAW to develop a feasible approach to cooperatively implement the dam removal option.

In December 2007, CDWR certified the Final EIR/S and in February 2008 the CDWR indicated that the dam safety issue could be addressed through implementation of the removal-reroute project.

The proposed plan will leave most of the existing sediment in place by

**Carmel River Reroute & San Clemente Dam Removal option**

Implementation of the dam removal alternative accomplishes dam removal by rerouting the Carmel River into San Clemente Creek at a location approximately 3,000 feet upstream of the San Clemente dam. Existing conditions of the San Clemente Dam and Carmel River are shown in Figure 3.

The dam removal project involves the following major construction components:

- Dam Access Roads
- Diversion Dike
- Reroute Channel and Upper Carmel River Reach
- Combined Flow Reach and Upper San Clemente Creek Reach
- Stabilized Sediment Slope
- Sediment Stockpile
- Dam Removal
- Old Carmel River Dam (OCRD) Removal

The proposed plan will leave most of the existing sediment in place by

**Figure 2: View downstream of San Clemente Dam while under construction during spring 1921**

**Figure 3: Existing conditions of the dam and river**
rerouting a one-half mile section of the Carmel River away from the reservoir connecting directly to San Clemente Creek, a nearby tributary. By leaving sediment in place, the need to haul away a volume of material that would require more than 250,000 truckloads is eliminated. The traffic level required to haul this amount of material was considered unacceptable for the rural area surrounding the dam.

“This concept of rerouting the river and leaving the sediment in its current location is critical,” said Richard Svindland, P.E, the Vice President of Engineering for California American Water. “The reroute concept made the goal of dam removal feasible.”

A nearly 400-foot-long dike constructed of earth-fill material present at the site will be used to divert the Carmel River. The diversion structure is expected to have a height of 45 to 50 feet and will include a seepage cut-off wall extending down to bedrock. A massive wedge-shaped slope—approximately 700 feet long, 70 feet tall, also made of earth-fill material—will be constructed upstream of the dam to stabilize the sediment in the reservoir and prevent the material from moving downstream. Sediment removed from other project locations will also be placed behind the stabilized sediment slope. The San Clemente dam will be removed once the dike and slope have been completed.

The rerouted section of the Carmel River will be restored to include a series of pools, riffles, and drop features that will improve conditions for fish. These improved conditions will allow returning steelhead to move upstream through the project site more naturally than the existing, outdated fish ladder. Removing the aging dam will greatly improve access to 25 miles of spawning and rearing habitat upstream. Additionally, removal of the dam will enable sediment within the river to move downstream, helping to replenish supplies of sand to beach and dune areas near the river’s mouth.

The proposed site conditions for the completed project are shown in Figure 4.

After the project is complete, CAW-owned property around San Clemente Dam will be conveyed to the U.S. Department of Interior Bureau of Land Management. The estimated project cost is $83 million.

San Clemente Dam Removal Project Partnership
With the project plan in place and approved, the funding to make the ambitious plan move forward would require further cooperation between the water utility and all stakeholder agencies. This effort will be realized through unique partnerships and financing mechanisms that will likely serve as a model for other antiquated dams slated for removal in the state.

“This project represents the latest innovations in biological, environmental and structural engineering,” said California American Water President Rob MacLean. “It’s a monumental endeavor that is born from a unique partnership between California American Water and local, state and federal government agencies as well as regional environmental groups.”

California Public Utilities Commission
As an investor-owned water utility, all projects are approved by the California Public Utilities Commission (PUC).

The PUC determined that CAW ratepayers would fund the portion of the construction cost that would have been necessary to seismically retrofit the dam, representing the least-cost option to comply with the state’s order.

As a result of the PUC determination, the company contribution was limited to $49 million, which is equivalent to the expected cost to buttress the dam. The remaining
$34 million is being funded by the California State Coastal Conservancy and National Marine Fisheries Service through public and private sources.

**California State Coastal Conservancy**
The California State Coastal Conservancy was the primary advocate for the approved option when the dam buttressing option was being studied. This agency has contributed and is assisting with raising the additional money to implement this project. The Planning and Conservation League Foundation, under the direction of the California State Coastal Conservancy, is to assist with public outreach.

**National Oceanic and Atmospheric Administration (NOAA)**
In addition to funding assistance, the role of NOAA is to ensure the vitality of the threatened steelhead trout habitat.

**Design Consultants and Construction**
The project will be constructed using a design-build construction contract and contractor selection will be based on a competitive procurement process led by CAW.

**Conclusion**
Currently, this project has been approved by the CPUC and is in the final permitting stages for implementation. The approved project components resulted from many differing viewpoints of the stakeholder agencies. The effort to move this project towards execution has been an outstanding model for a successful collaboration between federal and state government agencies and CAW.

At the end, this public-private partnership will result in 25 miles of spawning and rearing habitat returned to a more natural state and sediment within the river will move downstream again, helping to replenish supplies of sand to beach and dune areas near the river’s mouth.

Richard Svindland is the Vice-President of Engineering for California American Water, a subsidiary of American Water, which is headquartered in Voorhees, New Jersey. Richard has more than 20 years of experience in the design and management of water and wastewater facilities for both investor-owned and municipal utilities. He can be reached at (916) 568-4296 or richard.svindland@amwater.com.

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Barry Sheff, P.E., Senior Project Manager, and Zachary Henderson, CPSWQ, Project Scientist, Woodard & Curran, Portland, Maine

Communities work hard to meet the requirements of the Clean Water Act under a number of separate regulatory programs and structures. Born from necessity in the early days of clean water regulations, this fragmented approach means that closely-related issues are often tackled separately, leading to inefficiencies and overlap of utility missions, added expense for communities, and a tangled web of interactions with regulators. Under worst-case scenarios, communities may be simply paying to maintain compliance rather than investing in projects with long-term environmental and public health benefit.

In an ideal regulatory world, clean water efforts would be closely coordinated so that the permits held by communities work together to maximize the benefit at the lowest cost and investments would be made with a clear understanding of the improvements to the receiving water. That is exactly the goal of the new integrated planning framework advocated for by EPA. Under this framework, water resource protection problems are examined holistically and projects can be planned so that the highest-priority, most environmentally-beneficial projects are tackled first while deadlines for compliance with less beneficial projects are extended. Integrated planning should provide communities more control over how and when to spend their limited resources, with a focus on water resource protection projects with the greatest return on investment.

Controlling your destiny
Regulatory silos have developed within historical frameworks, inadvertently isolating compliance costs within municipal divisions, districts or utilities and complicating efforts to address the most critical needs for public health and environmental protection. An integrated plan looks beyond National Pollution Discharge Elimination System (NPDES) obligations and examines the benefit of actions to address Sanitary Sewer Overflows (SSOs); Combined Sewer Overflows (CSOs); Capacity, Management, Operations, and Maintenance (CMOM); Publicly Owned Treatment Works (POTWs); and Municipal Separate Storm Sewer Systems (MS4). In breaking down the silos, communities can examine all water resource program needs together and work with the EPA or their delegated state agencies to establish a permit that provides a streamlined approach to addressing regulatory obligations.

One of the attractions of integrated planning is that it allows communities to comprehensively regain control of their clean water programs. Instead of reacting to water resource protection requirements, an integrated plan allows a community to determine how best to approach its Clean Water Act obligations. At its heart, integrated planning is about identifying all of a community’s water resource protection needs, deciding which ones have the best cost-to-benefit ratio, and staging them in a way that is most appropriate for the community.

Challenges remain
While promising, integrated planning has challenges that must be carefully considered. An examination of all impacts to a receiving water (or waters) from a variety of pollutants requires a fairly robust understanding...
of infrastructure and pollutant sources, and supported by a tool that simulates pollution sources with sufficient accuracy for effective management and tracking results. The presumptive model may no longer be appropriate and should be replaced with a demonstrative model by which the impact of a project can be meaningfully measured. Communities lacking a complete understanding of regulatory compliance liability, particularly for stormwater and drainage system assets, may not fully realize a return on investment in the earliest implementation years and the costs for science and planning may be daunting. Additionally, the evaluation of Clean Water Act components that have been loosely required in the past will clearly expand the scrutiny on a community's existing programs and pollutant sources. There is a certain level of trust, or leap of faith required that the investment in planning will pay off.

Finding efficiencies and realizing the promise

Integrated planning is a new way of approaching existing requirements. While there is no guarantee that a written plan will lead to modified permits or timelines, the increasing pressure to address infrastructure renewal and the specter of increasingly stringent biological and water quality criteria are real. The investment in an integrated plan may provide significant return. For example, recent studies across the country on the efficacy of municipal pollution prevention actions (like streetsweeping and infrastructure cleaning) are documenting the cost effectiveness of these programs versus the diminishing returns on point source technology treatment. Addressing loosely-regulated nonpoint sources of pollution via trading programs is a well-documented solution to water quality restoration and protection of human health; however, very few NPDES permits acknowledge this opportunity.

Beyond the obvious attraction of potential compliance timeline extensions or modified permits and consent orders, integrated plans (or a version of them) may allow a community to find cost savings in operational efficiencies that they might not otherwise realize. As integrated planning requires an examination of a wide range of pollution sources typically managed by a variety of entities, the overlap and redundancies across departments or utilities will become clear. Integrated planning will necessitate change: integration and improved coordination of operations and management across previously separated municipal entities. Perhaps the most likely challenge to the promise of integrated planning is a restructuring of how communities communicate and operate. With increasing scrutiny of public expenditures, and a growing appreciation for the need to address environmental issues, is there really a choice?

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EPA’s Integrated Planning Framework: A common sense step forward

Kevin L. Shafer, P.E.
Executive Director
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Milwaukee, Wisconsin

When the Clean Water Act was signed 40 years ago, our nation’s municipalities had to take drastic steps to improve our water environment. It was a matter of public health. Today, we all benefit from those past investments, but, to stay ahead of population growth, limited resources, and changing climate conditions, infrastructure improvements must continue.

The concern and confusion begin when municipal leaders try to determine what the next steps should be. This process is hindered by the fact that municipalities are pulled in many different directions by regulations that sometimes are diametrically opposite. Regulatory requirements for stormwater management and combined or separate sanitary sewers create competing interests and may not always lead to the best investment. How do we decide what the next infrastructure investment should be and how do we prioritize these investments in a world of limited financial resources?

Recently, the Environmental Protection Agency (EPA) unveiled an “integrated planning framework” which provides an approach to help answer that question. While it may not be appropriate for every municipality, it does lay out a comprehensive approach that could reduce costs and provide greater environmental improvements.

Quoting the EPA website, “An integrated planning process has the potential to identify a prioritized critical path to achieving the water

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quality objectives of the Clean Water Act by identifying efficiencies in implementing competing requirements that arise from separate wastewater and stormwater projects, including capital investments and operation and maintenance requirements." In short, the framework is a common sense approach to make improvements to address water quality issues.

The elements of EPA's plan are:

1. Identify water quality, human health, and regulatory issues;
2. Describe existing wastewater and stormwater systems;
3. Create a process for stakeholder involvement;
4. Develop a process for screening alternative solutions; and
5. Develop a means to measure the success of the plan.

The framework allows each municipality to gather watershed-specific concerns and technical information through a collaborative planning process with the public. Then, as long as regulatory standards are still met, the municipality can develop a plan that brings the competing interests into a uniform approach to watershed improvements.

In Milwaukee, Wisconsin, the Milwaukee Metropolitan Sewerage District (MMSD) adopted this approach in 2002 when it initiated its 2020 Facilities Plan (http://v3.mmsd.com/wqi1.aspx). MMSD is a regional government agency that provides water reclamation and flood management services for about 1.1 million customers in 28 communities in the Greater Milwaukee area. It serves 411 square miles that cover all, or segments of, six watersheds (Fig. 1). Along with its core responsibilities, MMSD also handles water quality research, household hazardous waste collection, pharmaceutical collection, industrial waste monitoring, laboratory services, and planning and engineering services.

Following passage of the Clean Water Act, MMSD built an extensive network of deep tunnels to provide storage for large storms. In 2002, these past efforts resulted in excellent permit compliance (Fig. 2), but, moving forward, a better approach was needed to ensure that the
regulatory demands were still met and that MMSD invested its resources where they would have the most benefit. When MMSD initiated this effort in 2002, there was a similar integrated framework referred to as a Regional Water Quality Management Plan in section 208 of the Clean Water Act. Many regions went through the 208 planning process in the 1970s and 1980s, but, recently, 208 plans have not been updated. In 2002, MMSD realized that it needed a complete picture to plan its future infrastructure. MMSD knew that, although its permit compliance was excellent, its public demanded more. The public saw reports of closed beaches, combined sewer overflows, and unhealthy ecosystems and wondered what the causes were. MMSD dusted off the 208 planning process and used it to create a collaborative, watershed-based analysis of its situation. Completed in 2008, this integrated 208 Plan said that the next water investments the Milwaukee region should focus on were stormwater infrastructure, along with continued rehabilitation of existing infrastructure. The integrated 208 Plan not only became MMSD’s capital improvement plan for the future, it more importantly identified all the sources of pollution to the regional watersheds. Since the integrated 208 Plan was published, it has become a valuable tool for teaching the public about the sources of water pollution. Through this education process, coalitions have formed that have helped the Milwaukee region to understand more fully where the next investments should be made.

One coalition is the Southeast Wisconsin Watersheds Trust, Inc. (SWWT) (www.swwtwater.org). This amazing organization is a collaboration of governments, businesses, and environmental groups all working toward water quality

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Figure 2: Percent of Wastewater Captured and Cleaned

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improvements identified in the integrated 208 Plan.

Having started the planning process in 2002, MMSD was keenly aware that improved stormwater management was necessary. Not having jurisdictional authority over stormwater in the region was one concern that required MMSD to take a different approach. MMSD identified many advantages to utilizing green infrastructure, so it implemented an extensive green program that continues today. The “Fresh Coast, Green Solutions” publication (http://www.mmsd.com/%5Cassetsclient%5Cddocuments%5Csustainability%5C SustainBookletweb1209.pdf) defines 10 strategies that MMSD utilizes in the program. To get started, MMSD initiated a pilot program with 100% reimbursement from MMSD; however, as green infrastructure solutions have become more accepted, MMSD has reduced its contribution. Financing now is a partnership agreement.

MMSD has also championed the establishment of a watershed permit for the Menomonee River. By using this approach, the permit allows for the municipalities to receive regulatory credit for working together on watershed opportunities that might cross over several municipal boundaries. This new permit will foster collaborative projects that provide water management improvements that help to address the recommendations from the integrated 208 Plan.

Today, MMSD partners on many efforts in our region. All efforts that are tied to water quantity and quality management are direct results of its integrated 208 Plan. While MMSD’s integrated 208 Plan was completed prior to the commencement of EPA’s latest discussion on integrated planning, they are the same. Both plans are supported by the Clean Water Act.

In Milwaukee, the development of the plan assisted its public with improvement of its knowledge of water issues today. As municipal leaders, it is sometimes hard to unravel all of the regulatory issues surrounding compliance with the Clean Water Act. The EPA’s integrated planning effort helps to remove that cloud and allow for better alignment of resources with environmental improvements.

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Studies by the U.S. Geological Survey (USGS) have demonstrated that coal-tar-based sealcoat—a product marketed to protect and beautify the asphalt pavement of driveways and parking lots—contributes polycyclic aromatic hydrocarbons (PAHs) to air, soils, streams and lakes, and homes.

What are sealcoat, coal tar, and PAHs?

Pavement sealcoat (also called sealant or driveway sealer) is a black liquid sprayed onto the asphalt pavement of residential driveways, parking lots, and even some playgrounds (Fig. 1). Most sealcoat products have a coal-tar-pitch or asphalt (oil) base. Sealcoat used in the central, southern, and eastern U.S. commonly contains coal tar, a known human carcinogen, is the residue remaining after distillation of coal tar, a byproduct of the coking of coal. Coal-tar-based sealcoat typically is 20 to 35 percent coal-tar pitch and contains from 50,000 to 100,000 milligrams per kilogram (or parts per million) PAHs, about 1,000 times more PAHs than in asphalt-based sealcoat products. There are hundreds of times more PAHs in coal-tar-based sealcoat than in tire particles, used motor oil, or other urban sources. Several PAHs are toxic, carcinogenic, mutagenic, and/or teratogenic (causing birth defects). At least seven PAHs, including benzo[al]pyrene, are probable human carcinogens.

PAHs from coal-tar-based sealcoat contaminate air, soil, streams and lakes, and homes

PAHs from coal-tar-based pavement sealant find their way into many parts of the environment (Fig. 2). When coal-tar-based sealcoat is first applied, as much as one-half of the PAHs volatilize (evaporate) into the air, which is why recently sealed pavement gives off such a strong smell, particularly on a hot day. A study in Austin, Tex., measured PAHs in air over a parking lot following application of coal-tar-based sealcoat; PAH concentrations initially were hundreds to thousands of times higher than in air over unsealed parking lots. Concentrations decreased during the following weeks, but even years after application, coal-tar-sealcoated lots continue to release about 60 times more PAHs into the air than do unsealed asphalt lots. The amount of PAHs released into the air from coal-tar-sealcoated lots in the U.S. each year is estimated to exceed that from vehicle emissions.

Friction from vehicle tires abrades pavement sealcoat into small particles—sealcoat wear is visible in high traffic areas within a few months after application. Dust on the coal-tar-sealcoated pavement surface contains PAHs at concentrations that...
are hundreds of times higher than those in dust on concrete or unsealed asphalt pavement (Fig. 3). Wind, rain, and snowplows transport some of that dust to nearby soil.

Stormwater transports abraded sealcoat particles off pavement, and the first stop for stormwater runoff in many communities is a retention pond. By design, retention ponds trap particles, which creates an unintended problem for many municipalities because PAHs accumulate in the pond sediment. Sediment in 5 of 10 ponds sampled in the Minneapolis-St. Paul, Minn., metropolitan area had PAH concentrations that exceeded a threshold above which disposal costs greatly increase—if PAHs in just 10% of the estimated 20,000 stormwater ponds in the area exceed that threshold, costs for disposing of the sediment could reach $1 billion.

Some sealcoat particles are transported by streams and rivers to lakes, where they are deposited in lake sediment. The PAH chemical fingerprints—the combination of different PAHs measured in a sample—for lake sediments studied by the USGS in central, southern, and eastern U.S. cities are a close match for those in dust from coal-tar-sealcoated pavement. The chemical fingerprints for lake sediment in the western U.S., where the coal-tar product is not commonly used, are different. Coal-tar-based sealcoat was estimated to contribute about one-half of the PAHs in sediment from 40 urban lakes studied by the USGS; vehicles and coal combustion contributed most of the rest.

PAHs from pavement with coal-tar-based sealcoat make their way indoors, too. In a study in Austin, Tex., concentrations of PAHs in house dust in apartments adjacent to parking lots with coal-tar-based sealcoat were 25 times higher than

Figure 2: PAHs from coal-tar-based pavement sealcoat are transported by different pathways to various environmental compartments. Once dry, the sealcoat product (A), which contains high concentrations of PAHs, is abraded into a powder and becomes part of the dust on the pavement (B). That dust is transported by storm runoff (C) to stormwater management devices (D) or to receiving streams and lakes (E). Parking lot dust also adheres to tires (F), which track it onto unsealed pavement, and wind and runoff transport the dust to nearby soils (G). Dust particles also are tracked on shoes into residences, where they become incorporated into house dust (H). Coal-tar-based pavement sealcoat also contains volatile PAHs that are released into the air (I). (Modified from Mahler, B.J., 2012, Environ. Sci. Technol. 56(6):3039-3045)

Figure 3: Dust swept from pavement with coal-tar-based sealcoat contains very high concentrations of polycyclic aromatic hydrocarbons (PAHs).
in those with concrete, unsealed asphalt, or asphalt-based-sealcoated parking lots (Fig. 4). House dust is a source for human exposure to many contaminants, including PAHs. This is particularly true for small children, who spend time on the floor and put their hands and objects into their mouths. Although tobacco smoking, candle and incense burning, and barbecue and fireplace use have been suggested to affect PAH concentrations in house dust, the study found no relation between any of these and PAH concentrations in the house dust.

Our environment and us—what are the PAH concerns?
Some PAHs are toxic to mammals, birds, fish, amphibians, and plants. Insects and other small creatures that live in streams and lakes are particularly sensitive to PAH contamination; they are an important part of the food chain and often are monitored as indicators of stream quality. Recent studies have shown that aquatic life downstream from sealcoated parking lots is impaired. Salamanders and newts exposed to sediment contaminated with coal-tar-based sealcoat have stunted growth, difficulty swimming or righting themselves, and liver problems; and frogs exposed to sediment contaminated with coal-tar-based sealcoat have stunted growth, develop more slowly than usual, or die.

People can be exposed to PAHs in sealcoat through incidental ingestion of coal-tar sealcoat particles abraded from driveways, parking lots, or playgrounds. There is a significant increase in estimated excess lifetime cancer risk for residents living near coal-tar-sealcoated pavement associated with incidental ingestion of PAH-contaminated soil and house dust. Much of the exposures associated with the excess risk occur during childhood. Other exposure pathways include skin contact with the sealed pavement or abraded particles and inhalation of PAH-contaminated air near sealcoated parking lots.

Regulatory and retail actions
Actions have been taken in some parts of the U.S. to ban or restrict the use of coal-tar-based sealcoat in the U.S. The first ban was implemented by the City of Austin, Tex., in 2006. Since then, sales and use of coal-tar-based sealcoat have been banned in numerous cities (including Minneapolis, Minn., and Washington, D.C.), in three counties, and in the State of Washington. Other local and state jurisdictions have used voluntary or limited-use restrictions for certain groups (e.g., city governments) to discourage use of coal-tar-based sealcoat.

Several national and regional hardware and home-improvement retailers have voluntarily ceased selling coal-tar-based sealcoat, and some applicators have chosen to use only asphalt-based sealcoat. Many sealcoat applicators in areas unaffected by bans or restrictions, however, continue to use coal-tar-based sealcoat.

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Main Terrain features stormwater management system beneficial to the Tennessee River community

Detention areas will provide relief to Chattanooga’s aging storm-sewer system

Taylor Hartley
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Waterhouse Public Relations
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While generating community engagement through art and fitness, Main Terrain, Chattanooga’s new urban art park in the making, simultaneously serves as a stormwater management site. Constructed with multiple goals in mind, this key ecological feature harvests rainwater for reuse, battles overflow which leads to flooding and downstream erosion, and eliminates pollution caused by stormwater collecting trash and impurities before entering storm drains.

Due to increased development and antiquated wastewater treatment systems, stormwater detention structures are vitally important in urban settings. During heavy rain events, the overflow of water that cannot be contained within underground sewer systems sends untreated sewage and polluted stormwater into rivers. In Chattanooga’s case, this combination of stormwater and sewage discharges directly into the Tennessee River. This poses a health hazard to the Chattanooga population and beyond, as well as fish and wildlife.

The 1.72-acre tract of land on which Main Terrain sits has two stormwater detention ponds built in. By design, the basins are shallow and flat. Within a day of a rain event, the ponds empty of all standing water. This allows the space to be dry and usable for active parkgoers.

Main Terrain’s stormwater treatment structures act as a method of flood control by detaining excess stormwater runoff and discharging it at a slow, even rate. This helps prevent the city’s combined sewer system from becoming overloaded during rainstorms. Utilizing a new technology that has yet to be seen in Chattanooga, the detention ponds have OptiRTC real-time intelligence built in. OptiRTC is directly linked to the National Oceanic and Atmospheric Administration weather radar, which allows it to sense when a rain event is coming. The automated system ensures there is capacity in the detention structure to hold the impending runoff.

The onsite detention ponds have a capacity of more than 133,000 gallons of water, the amount a typical rain event produces over the five acres around the park. Overall, the detention areas create an annual reduction of up to 1.5 million gallons of water that would have ended up in the Chattanooga sewer system. The water from Main Street, where Main Terrain is located, flows through the combined sewer system and must be treated at Moccasin Bend Wastewater Treatment Plant. The detention ponds help to alleviate the overburden of water that is handled at the plant.

“Forward-thinking designers whose plans include stormwater management systems, such as those developing Main Terrain, are a real asset to the community,” said Dennis Malone, Assistant City Engineer in the City of Chattanooga’s Public Works Department. “By eliminating some of the enormous burden stormwater creates on our current sewer system, this park benefits the public in incalculable ways.”

Marked as the termination point of long-abandoned rail lines, Main Terrain was a 1.72-acre vacant, dilapidated tract of land before the transformation began. Now, the park will serve a variety of purposes for the community, including stormwater management.
In the City of Chattanooga, all businesses must pay a water quality fee based on how much stormwater flows off the property’s impervious surfaces, including buildings, parking lots, rooftops, driveways and streets. This fee covers the costs to manage the City Water Quality Program, responsible for reducing stormwater runoff pollutants, and to maintain the city stormwater sewer system. The water storage facilities at Main Terrain not only service the park, but a five-acre radius around the site. This allows for other local businesses to redirect their stormwater runoff and utilize the ponds’ storage capacities. If companies around Main Terrain choose to do so, the City water quality fee they face would decrease due to the reduction in the amount of water impacting the City’s infrastructure.

While the first goal of such detention systems is to manage stormwater runoff to prevent flooding, they also allow for water quality improvement by filtering pollutants and sediments from stormwater runoff before the water is discharged back into the sewer system. Additionally, the detention ponds help prevent the downstream erosion of banks that occurs when bodies of water are overwhelmed with a high volume of stormwater.

Adding even further benefit, the water in the detention areas at Main Terrain is repurposed through a harvested rainwater system. The drain underneath the ponds carries the storm drainage into a separate piping system, where it is stored for reuse. Each week, 40,000 gallons of accumulated stormwater is reused to supplement irrigation of the urban art park.

“Main Terrain has so much happening behind the scenes,” said Chris Davis, Design Engineer at Volkert who contributed to the project. “It’s remarkable that in this one multi-purpose area stormwater is being treated and reused and most people visiting the park don’t even know it is happening.”

Internationally-renowned artist Thomas Sayre was chosen from a national competition to design the distinctive urban park. Integrated as one art piece, the nine sculptures featured in Main Terrain, the tallest measuring more than 24 feet in height and 9,000 pounds in weight, are modeled from concrete pylons and steel trusses to be reminiscent of the Walnut Street Bridge, an iconic figure in the Chattanooga skyline. To allow for interaction and physical play, all of the sculptures are movable.

To fund Main Terrain, the National Endowment for the Arts (NEA) awarded Allied Arts of Greater Chattanooga, a nonprofit citywide arts council and funding source, one of only 51 nationwide Our Town grants to help with the project’s funding. Besides national funding, the project is also supported by a collaborative effort between numerous local businesses and nonprofits, including the City of Chattanooga, Public Art Chattanooga, Trust for Public Land, Lyndhurst Foundation, Ross/Fowler Architecture & Landscape Architecture, and PlayCore.
Society of Wetlands Scientists: A broad knowledge base to tap for NPDES compliance

Devin P. Wilson, CPESC
Environmental Scientist, Black & Veatch
Kansas City, Missouri
Past President, Society of Wetland Scientists Central Chapter

The Society of Wetland Scientists (SWS) is an international organization comprised of skilled professionals dedicated to fostering sound wetland science, education, and management. Established in 1980, the organization helps bridge the gap between ecologists and engineers and also helps municipalities comply with challenging new regulations. The U.S. Environmental Protection Agency (EPA) will propose a rule intended to strengthen the National Pollutant Discharge Elimination System (NPDES) program. The proposed rule is expected to be announced by June 10, 2013, with the final action slated for December 10, 2014 (http://cfpub.epa.gov/npdes/stormwater/rulemaking).

The proposed rule will require municipalities to address such topics as watershed-based permits, integrated planning, and implementation of green stormwater-infrastructure projects for combined sewer overflows. The rule also requires a more comprehensive approach for managing Total Maximum Daily Loads (TMDLs). Many members of the SWS can help municipalities work through these complex challenges, drawing from their broad natural resources knowledge.

More about the Society and Certification
The SWS (http://www.sws.org) was formed in the United States to discuss wetland science issues free of the limitations of political concerns. It has since evolved into an international organization with members from nearly every part of the globe. With a current membership of approximately 3,500 worldwide, the society continues to grow and gain a more global presence. While the society’s main activities are accomplished by regional chapters, the global network publishes a journal, Wetlands, to promote the leading edge of wetland science. In 1994, a professional certification program was established to further aid in identifying qualified wetland scientists. The Professional Wetland Scientist (PWS) certification (http://www.wetlandcert.org) identifies wetland scientists who possess a minimum competency and are qualified to manage wetland resources.

Member Composition and Expertise
SWS is comprised of professionals from a wide variety of fields.
Members are biologists, botanists, soil scientists, geologists, civil engineers, landscape architects, ecologists, hydrologists, students and faculty of colleges and universities, and other related fields. SWS professionals possess skills and experience greater than just wetland delineation, and they do more than just study wetlands. They have a diverse skill set and successfully apply natural resources concepts in engineered solutions such as constructed wetlands, channel restoration, and stormwater best management practices (BMPs). SWS professionals understand the role of native plants in many of these systems, and how plant communities can work together to achieve the desired goals. Society members also have a firm understanding of watersheds and how various landscapes impact the physical, chemical, and biological integrity of the watershed as a whole. Using this knowledge, SWS professionals help bridge the gap between engineers and ecologists by assisting with the design of solutions that are more resilient and self-sustaining than traditional hard-armoring designs and by drawing upon natural processes.

**Example Project Types**

Working with others on design teams, SWS professionals have successfully designed numerous kinds of stormwater BMPs. For area water bodies, SWS professionals design wetland and sediment forebays to reduce nutrient and sediment loading into lakes. They also design bioretention cells, filtration basins, vegetated filter strips, wet and dry detention facilities, and rain gardens. These BMPs have many of the same benefits as wetlands, such as reducing stormwater runoff and reducing nutrients in stormwater. These BMPs also have similar chemical, physical, and biological processes as wetlands, making SWS professionals a natural fit on BMP design teams.

SWS professionals assist in stream restoration projects, using their expertise in fluvial geomorphology and riparian ecology to develop designs that are more resilient to the extremes of nature over time than traditional hard-armoring solutions. Restoration of streams offers flood attenuation, water quality, habitat diversity, and other benefits. Professionals who have a diverse skill set have an advantage in bringing everything together, be it an individual project or larger master plan. In a watershed context, these projects can cumulatively meet or exceed regulatory targets set for the watershed. SWS professionals have the experience to make sure designs and studies are grounded in sound science, which can ensure a greater success rate and ultimately save money and other finite resources.

When the new rule is finally proposed by the EPA, there will certainly be questions about how best to bring communities into compliance. There are options when considering watershed-based permits, integrated planning, and implementation of green infrastructure projects for combined sewer overflows. I would encourage you to tap into the vast knowledge base and collective experience of the Society of Wetland Scientists.

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Portland has a population of 66,000 with a metropolitan population of approximately 265,000, which is one-fourth of Maine’s population. Portland is a coastal city with a geographical area of 53 square miles; however, only 21 square miles are land due to coves, estuaries and islands with the remainder being water. Portland is challenged with multiple impaired streams within the community, protection of its estuaries, and elevated bacteria counts along its shores.

Portland established its original Combined Sewer Overflow (CSO) Long Term Control Plan (LTCP) in 1993. In 1993, it was estimated the yearly overflow volumes were 720 million gallons per year. The objective of the LTCP was:

- Eliminate 33 of the 39 CSOs
- Reduce the number of CSO events by 85 percent
- Reduce the volume by 88 percent or 87 million gallons per year
- Eliminate CSO discharges to sensitive water bodies of Capisic, Fall Brook, Fore River and the Presumpscot River

Nearly 20 years later, the City is currently completing the second tier (Tier II) of its LTCP. Tier I consisted of 38 sewer separation projects and nine flood control projects at a cost of 41 million dollars. Tier II consisting of 61 sewer separation projects, once complete this year, is estimated to cost an additional 61 million dollars bringing the CSO expenditures to 102 million dollars.

Currently the conditions are as follows:

- 32 CSOs remain potentially active
- 42 percent reduction in CSOs or 416 million gallons per year

The City hired an experienced engineering firm, CDM, to evaluate the effectiveness of the Tier I and Tier II program, recommend the changes to the remaining Tier II program and provide recommendations for an adaptable plan for its upcoming and long-term Tier III projects.

The firm’s scope was as follows:

- The development of baseline of the City’s CSO system summarizing the effectiveness of the work completed to date
- Analysis of the current collection system modeling data and recalibration
- Evaluation of anticipated CSO reduction from the remaining Tier II sewer separation projects to be completed prior to 2014
- Provide recommendations to the Tier II program that would provide cost savings and improved water quality
- Develop recommendations and alternatives for Tier III projects that will meet the objectives of the 1993 LTCP
- Provide the financial analysis of the costs associated with the proposed projects and their impact on the future sewer rates

An alternative analysis was conducted to determine if Tier II separation projects scheduled for completion by 2014 are cost effective compared to other CSO abatement technologies. The total area for separation projects completed through 2009 was estimated at 1,076 acres. System modeling predicted an annual CSO volume of 416 MG, or approximately a 42 percent reduction (from 720 MG estimated at the beginning of the program). Estimates of the areas that are proposed for separation to complete the Tier II projects in the Fall Brook and Capisic Brook watersheds totaled approximately 380 acres. This acreage was then removed from the model and reanalyzed. This post-separation run produced approximately 351 MG of annual overflow, equating to only an additional seven percent reduction (totaling 49 percent reduction from the original 720 MG of overflow). This relatively
small additional reduction may not be cost effective compared to other technologies. Therefore an analysis was undertaken to estimate if CSO technologies other than sewer separation (e.g., storage) could be more cost effective in the completion of the Tier II program.

With the assistance of CDM, the City and Portland Water District, managers of the Wastewater Treatment Facility engaged in stakeholder meetings. Stakeholders included water quality advocates, members of the business community, and the Maine Department of Environmental Protection (MDEP) in providing feedback on the CSO program. A program was developed that balanced the cost effectiveness of managing CSO discharges while best protecting water quality and public health. The plan proposes capital improvements estimated to cost $169 million (2011 dollars). The plan included a mix of solutions that placed a high reliance on storage facilities, but included supplemental sewer separation, green infrastructure, and treatment plant upgrades.

The plan was divided into three phases over a 15-year period. The three phases were as follows:

- **Phase A** – Construct up to 7 MG of storage facilities to capture CSOs on the west and south side of Back Cove. Also included are targeted sewer separation and green infrastructure projects to manage wet weather flows before they enter the combined system. These projects are estimated to cost $53.5 million (2011 dollars).

- **Phase B** – Construct up to 8 MG of storage facilities at Fore River Pump Station and along the southwest side of the peninsula. These projects are estimated to cost $60 million (2011 dollars).

- **Phase C** – Construct wet weather upgrades at the East End Waste Water Treatment Facility (EEWWTF), including upgrades to the North East Pump Station (NEPS), and complete additional sewer separation and green infrastructure projects. These projects are estimated to cost $60 million (2011 dollars).

The storage facilities are designed to capture the first flush (first inch of rainfall) of all rain events which contains the majority of pollutants. Ninety-three percent of rain events in New England are less than one inch. The first flush typically contains approximately 80 percent of storm volumes and 90 percent of the pollutants transported by the runoff according to a U.S. EPA report – U.S. EPA, (2010), Stormwater Best Management Practices (BMP) Performance Analysis, Region 1, prepared by TetraTech.

The rate of implementation was debated extensively. City staff recommended a 25-year implementation period due to the estimated project costs of $169 million (2011 dollars). Nearly 100% of the indebtedness would be carried by ratepayers of the city with a population of only 66,000. Stakeholders advocated strongly for a 15-year plan and ultimately, the Portland City Council elected to submit this LTCP with a 15-year implementation period to the MDEP for approval.

Challenges still remain as it relates to sustainability. As proposed, the annual sewer bill for a typical household in Portland is projected to increase from $460 in Fiscal Year 2011 to $1310 in Fiscal Year 2030. This represents an average increase of 5.6 percent from 2011 to 2030. The City has begun to evaluate the feasibility developing a stormwater utility as one mechanism to stabilize the increasing costs.

We continue to assess our future as we incur competing demands on resources such as multi-sector permits (MS4) and Capacity, Management, Operations, and Maintenance (CMOM). Is Integrated Planning and Permitting the answer to combining our various requirements, CSO, MS4, CMOM?

We shall see.

Eric Labelle has been a public works professional for over 25 years having worked in the areas of water, wastewater, engineering, and public works. He currently serves on APWA’s Water Resources Management Committee and as the Delegate for the Maine Chapter. He can be reached at (207) 874-8801 or elabelle@portlandmaine.gov.
How water utilities can improve preparedness planning


Drinking water and wastewater utility preparedness activities can be overlooked in this tough economic climate. The process of developing training and scheduling exercises is time-consuming and labor intensive, especially considering that many utilities lack a dedicated staff member assigned to this task. Nonetheless, planning is the most important step in the preparedness cycle and being prepared is essential to a utility's ability to respond and recover from an emergency. Training and exercise plans, in turn, are a critical component of the planning process and help utilities track their preparedness and increase response capacity to future incidents, such as Hurricane Sandy.

The U.S. Environmental Protection Agency (U.S. EPA) released “How to Develop a Multi-Year Training and Exercise Plan” to assist all utilities, big and small, in developing a multi-year training and exercise plan. As a side benefit, the Multi-Year Training and Exercise Plan (T&E Plan) is compliant with the Department of Homeland Security’s Homeland Security and Exercise Evaluation Program. The document provides training resources, templates and useful background information to make the planning process easier for utility planning teams. In addition, the document helps utilities to understand the types of exercises that will best meet their needs.

Emergency response training helps employees to understand their roles and responsibilities in emergencies and should occur at least annually for all employees to maintain familiarization with procedures and to provide necessary updates caused by changes within the utility. In addition, dedicated emergency response staff should take courses to familiarize themselves with the Incident Command System (ICS) structure and National Incident Management System (NIMS). ICS helps the utility to integrate into a common organizational structure within the response community and NIMS is a universal system for incident management. This training is available both online at http://training.fema.gov/emi/ and as classroom sessions (contact your local EMA for more details). Developing a plan helps to ensure prioritization of training needs and creates a system of accountability.

Exercising is the fifth step in the preparedness cycle following the assessment of threats, vulnerabilities, identification of shortfalls and implementation. It provides opportunities for practice prior to an actual incident. While tabletop exercises are most often used, utilities should familiarize themselves with
1. Secure senior level commitment upfront – Jonathan learned early that in order to achieve buy-in from mid-level management, he needed to ensure that senior management was on board with his plans. He scheduled a meeting with his management and informed them of the goals and benefits to developing a plan for the organization. Once senior management committed, his program became a priority and received the necessary resources and time commitment from others to complete the projected training and achieve stated exercise goals.

2. Coordinate with both internal and external stakeholders – Jonathan coordinated with his internal staff including all management who would be involved as well as individuals in the organization’s training department. He also coordinated with his community response partners to include public health, fire and local emergency management. Engaging more stakeholders resulted in better input and output during the training and exercise sessions.

3. Find adequate tools to show the value of the preparedness process – If the organization cannot see the value of the preparedness process, they will be less likely to participate. Illustrating the value must be in a succinct format that makes sense to everyone in the organization. This process helped Jonathan to identify and document corrective actions and their impact on the organization’s preparedness level. He shared the information that he learned with staff through departmental updates on the plan’s progress.

4. During exercises, do not overlook the value of practicing threat analysis – Threat analysis defines the potential exercise focus and should drive the exercise outcomes. However, it is commonplace during exercises to make assumptions about what the scenario has presented because of the fictitious nature of the exercise. During actual incidents, threat analysis is an essential part of understanding what can actually happen to your utility.

Although it may be difficult, find a mechanism during exercises to ensure that participants are considering all impacts that may be caused by the presented scenario.

5. Cultural change takes time; start in sections of the organization where you have the greatest amount of new individuals – Jonathan realized that implementing a T&E Plan would be a shift from the way the organization had implemented training and exercises in the past. As such, he started with the Drinking Water Services Division, which included employees who were in newer roles in the organization and therefore more willing to try a novel approach. This allowed for others in the organization to see the positive impact of the T&E Plan and made them more willing to engage in the process.

Water utilities that are seeking a mechanism for continual improvement in the area of preparedness will benefit from using this document. As the Multi-Year Training and Exercise Plan is implemented into the organization, employees will have a greater understanding of the utility’s preparedness plans and operations. This tool provides utilities with an easy-to-use planning process for implementing and evaluating training and exercises for increased preparedness. To get started, download “How to Develop a Multi-Year Training and Exercise Plan” here: http://water.epa.gov/infrastructure/watersecurity/emerplan/upload/epa816k11003.pdf.

For additional information, you may contact Nushat Thomas at thomas.nushat@epa.gov or (202) 564-4674 or Jonathan Reeves at Jonathan.Reeves@dcwater.com or (202) 787-7695.
“Our city is trying to increase the number of ways our employees recycle while on the job. Currently, we focus heavily on paper and commingled products (aluminum, plastic, etc.). We want to see what other ways local governments are recycling, (e.g., ink cartridges, street signs, etc.) and how their programs are set up to accomplish this.” Carmen Capezzuto, Palm Bay, FL

In my visits to Accredited agencies throughout the U.S. and Canada, I have found internal recycling to go from one extreme to the other. Most agencies are recycling office papers, plastic bottles, and aluminum cans but after that it varies considerably. Many on the West Coast are recycling almost everything, including food waste for composting and the wrappers or containers it is served in. Some are able to recycle glass while others can’t due to the market in their area for disposal. Most dispose of the used oil and may even burn it for heat in their garage areas. Paints are commingled to provide an inexpensive paint for residents or city projects to use. More are using the cooking oil collected from restaurants to burn for heat that may heat buildings or for special educational projects such as greenhouses for school horticulture projects.

The sad thing is that the goal of reducing the disposal rate to landfills to reach 50% is slipping instead of growing close to that number across the U.S. We focused on training children about recycling in school, Adventure Clubs, Scouts, and 4-H with the hope that they would grow into responsible adults and influence their parents along the way. Hasn’t seemed to provide the major impact we were hoping for. Maybe we, as cities, counties, etc. stopped educating people on a regular basis and the “easy” way of just pitching everything in the trash slipped back into our life styles. Sounds like a good New Year’s Resolution: We will increase education to our residents about the value of recycling in the coming year.

“Well, it’s that time of the year again. We’ve had snow and ice and freezing and thawing and now we’re trying to keep up with pothole repair. We used a hotline for several years where residents could call to report a pothole and we’d try to fill it within twenty-four hours but those calls have dropped off in recent years when we haven’t had as much severe winter weather. Any ideas on how to motivate the public to help us?”

I’ve got a dandy one! The City of Aurora, CO, has developed a “Pothole Contest”! Never thought you’d hear that, did you? They have and it is quite successful; probably because the contest is based on the size of the reported pothole. The reporter of the largest pothole of the season receives $50 from the City. The only drawback I could see would be a whole lot of calls coming in with the expectation of having the holes repaired within their timeframe but the folks in Aurora report it has been well received and folks are entering into the spirit of the contest. If you’d like more information, you could contact Chris Charnahan, Aurora Public Works, Aurora, CO.

“Some of us in the San Diego region are thinking about more collaboration among public works agencies in the region for anticipated benefits from efficiency gains. What are your thoughts and pieces of advice? And what areas, if any, do you recommend collaboration and partnership?” Mohsen Maali, Specifications Engineer, City of San Diego, CA

Thanks for the question. The practice of collaboration has grown dramatically since the downturn in the economy. We are hearing from agencies that collaborated to bid out asphalt overlay projects, curb and gutter work, fleet services, tree trimming, as well as joint purchasing for fuel, ice melt, sand, and a variety of other products. One city that has been especially successful in bidding out asphalt overlay is the Town of Fishers, IN. Eric Pethtel, Director of Public Works, wrote a great article titled “Plowing Through Boundaries” that was printed in the APWA Reporter. You can find the article on the APWA website on page 22 of the June 2010 issue. If other agencies are doing something along this line, please let me know and we’ll share that information.
SECOND ANSWER: In a recent column, I wrote about the value of roundabouts. I received a note today from Tony Giancola, Washington, DC, sharing a link to an article from the Federal Highways Administration that talks about the value of “mini” roundabouts and I thought the readers might appreciate seeing it. You can access it at: http://www.fhwa.dot.gov/publications/publicroads/13novdec/03.cfm. The article talks about “new to the U.S.” design which “provides a low-cost solution for improving intersection capacity and safety without the need for acquiring additional right-of-way.” As used here, the mini roundabout design refers to a single lane with an inscribed circular diameter between 50 and 90 feet with the defining feature being a traversable central and splitter islands that will accommodate larger vehicles. It’s a great article. Thanks, Tony, for sharing the information.

Q: “Can water and wastewater departments become Accredited, even if the rest of the public works area is not doing so?”

A: Absolutely. The Accreditation program is designed to serve any of the functional areas included in the Public Works Management Practices Manual. We Accredited two new utility agencies last year: the City of Fresno Public Utilities, Fresno, CA, and the City of Fairfield Public Utilities, Fairfield, OH. They join nineteen other agencies that have either direct responsibility for the utilities under public works or are stand-alone departments. We encourage agencies to discuss the possibility of the utilities joining the public works department when Accreditation is being discussed to ensure that both parties know the value and advantages of a joint application. For more information, please contact me at adaniels@apwa.net.

RESPONSE: A recent response to one of the questions quoted Jase Williams as saying, “a way for people to vote with their dullards.” We regret the typographical error. It should have read “a way for people to vote with their dollars.”

Ask Ann

Please address all inquiries to:

Ann Daniels

Director of Credentialing

APWA, 2345 Grand Blvd., Suite 700

Kansas City, MO 64108-2625

Fax questions to: (816) 472-1610

E-mail: adaniels@apwa.net

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