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Sonia Oton, Vice Chair

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- Golden Manhole Award  
- Collection Systems Committee  
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- Herb Evans Golf Tournament  
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Learn more at trojanuv.com/signa.
Greetings from the corner office! We are one-quarter of the way through our 65th year – and it’s looking to be a great year! The Industrial Waste & Pretreatment committee kickstarted the year with their successful workshop and seminar in Charlottesville in early March; the Regional Activity groups have already had several events; and VWEA participated in Engineering Career Day at the Science Museum in Richmond. The next few months look equally busy with the Stormwater Committee holding its first seminar in April; also in April the Utility Management Seminar, the Education Seminar in May and the Operations Committee holding its first-ever workshop and training in June. These events showcase what is best about VWEA – educating our members and volunteer effort. Thank you one and all!

I had the opportunity to help at the Career Day at the Science Museum and the experience reminded me again of how important scientific literacy is to a well-informed public. Our display featured some equipment used in the water industry – rigged up with colored water and ping pong balls to grab attendees’ attention. It worked magnificently! The kids were intrigued by the moving ball which gave us our chance to explain how pumps work and how important they are in the water industry. They loved turning the knob, increasing or decreasing the spray of water delivered, and how fast the pump worked. Children have an innate sense of wonder at the world and their fertile and open minds are the perfect receptacle for learning about science.

I wonder how science gets transformed from something full of wonder to an eight-year-old to something boring and alien to most adults. How does this lack of understanding of science affect our industry?

Recent studies indicate as few as seven percent of American adults were judged to be scientifically literate. And as many as half of survey respondents don’t know how long it takes the earth to orbit the sun and even more surprising – one in five thinks the sun goes around the earth!

We need to improve our efforts to educate children to become scientists, engineers, mathematicians (STEM programs are designed to increase our schools output in Science, Technology, Engineering and Math) so the water industry will be able to attract the next generation of problem solvers. We also need to do a better job of educating the public and decision makers (re: politicians) on the technological and financial challenges that face our industry.

That’s why the mission of VWEA to educate our members and the public is so important and why we are expanding our scholarship program this year. We want to encourage those eight-year-olds out there to stay in science class – enjoy it and ultimately make it their career. They might not always get to play with ping pong balls and colored water – but they may design or operate the next big breakthrough in water treatment.

PS.: VWEA members are judges at science fairs in Virginia every spring. We award cash prizes to the top three water-related projects. Check out the website for details on how to sign up for this fun and rewarding experience.

REFERENCES

Only 47% of American adults were able to give an approximation of how much of the Earth’s surface is covered with water, and 50% thought that early humans coexisted with dinosaurs.
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“What’s in it for me?” is a question that potential new members may ask themselves as they contemplate joining VWEA. A strong and vibrant organization needs to continually reinvent itself, adapting to changes in the industry and delivering real value to its membership. VWEA’s mission to preserve and enhance Virginia’s water environment requires that we have a strong membership base. One of my goals is to increase membership and encourage current members to become more active in the association. To answer the question above, I have listed the following benefits of membership in VWEA:

**Education and training:**
Continuing education is one of the most valuable benefits that VWEA offers. The association offers a variety of conferences, workshops, and education luncheons throughout the state on an array of topics that are important to the industry.

**Knowledge sharing:**
Meeting with colleagues and experts in the wastewater field provides unique insights into issues that are specific to the field.

**Professional growth:**
Serving on committees or volunteering in leadership positions provides an opportunity to learn new skills and grow professionally.

**Recognition and scholarships:**
Members can be recognized and receive awards in areas such as plant operations, maintenance, safety, laboratory excellence and public service. Scholarships are awarded to students from across the state. Be on the lookout for information on new scholarship opportunities beginning in 2013!

**Networking:**
VWEA members have the opportunity to connect with other wastewater professionals by attending conferences, seminars, training sessions and social events.

**Discounts:**
VWEA members are eligible for reduced pricing for conferences, publications, and more!

Together, we can grow stronger and work to ensure that members realize the benefits of membership in VWEA.

These are just a few of the benefits that you will realize as an active member in the association. I hope when you are talking with a potential member you will take the opportunity to share with them the value that comes with a VWEA membership. Together, we can grow stronger and work to ensure that members realize the benefits of membership in VWEA.
Help make a difference in our environment! Join volunteers throughout Fairfax County who monitor water quality in local streams. County and state officials will use the data you collect to assess the overall condition of our streams and help determine watershed management initiatives.

The Northern Virginia Soil and Water Conservation District provides all the training and equipment you need. No prior experience is necessary. We train volunteers to assess ecological conditions in streams based on the presence and abundance of benthic macroinvertebrates (aquatic insects). Volunteers also learn how to take chemical measurements about nitrate/nitrite and turbidity. Training includes indoor and field workshops and mentoring by experienced monitors.

Volunteers can monitor at different levels of commitment. You may choose to assist other monitors when it is convenient for your schedule. Or you may adopt your chosen stream and commit to monitoring it four times a year. We will make the program work for you!

NVSWCD reviews and certifies the data and forwards it to the Fairfax County Stream Protection Strategy Program, Virginia Department of Environmental Quality, and Virginia Save Our Streams.

If you are interested in becoming a monitor, e-mail Dan Schwartz (the coordinator), or call 703-324-1422, TTY 711.
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Why are YOU a member?

“I have had the opportunity to network and problem solve with personnel from other utilities. The information and resources available through VWEA contribute to the successful operation of the wastewater treatment facility.”

– Martin E. Sensabaugh, PWO Member, Wastewater Operations Manager, Western Virginia Water Authority.

“Being a member of VWEA provides me the opportunity to enhance my knowledge, skills and abilities in the Biosolids Program. This enables me to help my organization and also help my upward mobility in my organization. Being a part of VWEA also provides me the opportunity for networking with other organizations to share ideas, innovations and technologies.”

– Barbara Jackson, Biosolids Supervisor, PWO Member, City of Richmond Department of Public Utilities.

“The training and technical seminars throughout the year provide a great platform for learning industry trends and technologies and help with professional growth and my career. Being actively involved with the Young Professionals Committee, I have had opportunities to meet talented young professionals, volunteer for community service events, and participate in fun/social events.”

– Neepa Shah, Young Professional Member, Engineer, Greeley and Hansen.

“I believe that I have benefitted from my membership in VWEA and so has my employer. As Chair of the Utility Management Committee, I see first-hand the best practices implemented by other municipalities across Virginia and I can bring these good ideas to my organization.”

– Bruce W. Husselbee, Professional Member, Director of Engineering, Hampton Roads Sanitation District.

“My membership has allowed me the privilege of experiences I previously would not have had, and it has enabled me to grow personally as well as professionally. I cannot emphasize enough the value of joining an organization such as this.”

– Mala Burton, Professional Member, Laboratory Supervisor, Hopewell Regional Wastewater Authority.
Introducing VWEA’s 1st Annual Report! We have had a lot of people working hard to put this together and I am in grateful debt to all of them. Thanks to you, VWEA continues to thrive in a very challenging environment. Our financial health is sound (pages 3 and 4 of our annual report), but more importantly we continue to grow our outreach and build on our membership base. Our mission is focused on delivering education, expertise, while at the same time advancing both our industry and our knowledge of the environment.

2012 is our 65th anniversary as a volunteer organization and we should take the time to recognize the achievements realized by this organization in 2011. We put on six major meetings during the year, awarding hundreds of continuing education credits; we had the most successful JAM ever — over 1,100 attendees during the four days we were in Virginia Beach; we sent four Operations Challenge teams to WEFTEC to compete on the national level, including a brand new team — the Blue Ridge Brawlers, who placed 4th in their division. We awarded over $10,000 in scholarships and grants to students and other worthy groups — and we are planning to exceed that this year. We updated and improved our website, enhanced our magazine (The Conduit) with an enhanced interactive version available on the web or by email and utilized on-line registration. We hired a full-time Administrator (Kathy Rabalais) who is smart, funny and eager to make VWEA better than ever.

We have had numerous opportunities to learn, share, laugh with and inspire each other in 2011 and I am looking forward to an even better 2012!

Please take a moment to review the information in this report and as always, let us know how we can continue to serve you — our most valuable asset.

President, VWEA
City of Richmond DPU

“In 2011 VWEA awarded over $10,000 in scholarships and grants – we plan to exceed that this year.”
Virginia Water Environment Association 2011 Accomplishments

“For the 1st time in event history, VWEA proudly sent four teams to WEFTEC in Los Angeles to compete in the National Operations Challenge. Virginia Beach Terminal Velocity repeated as Division I champions.”

The four teams representing VWEA at WEFTEC pictured above are: Terminal Velocity, Blue Ridge Brawlers, Team HRSD and Virginia Beach Collectors.

2011 Joint Annual Meeting (JAM)
Four days of education & networking with our friends at VA AWWA
Record setting turnout with 1,100 attendees!

2011 Scholarships/Donations
Water Reach
Water For People
Stockholm Junior Water Prize
Water Environment Research Foundation
Sonny Roden Memorial Scholarships
JAM 2011 Graduate Student Paper Awards
JAM 2011 Student Design Competition Awards

2011 Seminars and Conferences
Good Lab Practices, 202 attendees and 32 exhibitors.
Education Seminar, 176 attendees
Industrial Waste & Pretreatment, 24 hours of education credits

2011 Lunch and Learns/Webinars
Asset Management, 45 attendees

2011 Workshops @ JAM
Sustainable Utilities, 31 attendees
Laboratory Practices, 25 attendees
Communications, 16 attendees

2011 Work for Water Initiative
Water and Wastewater Recruitment Seminar
Human Resources Workshop
Participated in two high school career days
Participated in two middle school career days
Participated in two career fairs

Plus many more!
## VWEA Balance Sheet

Preliminary, (not audited). As of December 31, 2011

### ASSETS

Current Assets

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2010</th>
<th>$ Change</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>CHECKING ACCOUNTS</strong></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Wachovia</td>
<td>98,574.73</td>
<td>98,348.24</td>
<td>226.49</td>
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<tr>
<td>Sun Trust</td>
<td>92,119.93</td>
<td>61,138.66</td>
<td>30,981.27</td>
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<td><strong>MONEY MARKET ACCOUNTS</strong></td>
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<td>Suntrust Money Market Account</td>
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<td>146,576.09</td>
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<td>-6.67%</td>
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<td><strong>INVESTMENT ACCOUNTS</strong></td>
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<tr>
<td>Bank of America - CD</td>
<td>101,866.70</td>
<td>101,022.19</td>
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<td>Sun Trust - CD</td>
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<td>23,150.51</td>
<td>402.78</td>
<td>1.74%</td>
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<td><strong>Total Bank Accounts</strong></td>
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<td>$430,235.69</td>
<td>$22,680.91</td>
<td>5.27%</td>
</tr>
<tr>
<td><strong>Total Current Assets</strong></td>
<td>$452,916.60</td>
<td>$430,235.69</td>
<td>$22,680.91</td>
<td>5.27%</td>
</tr>
<tr>
<td><strong>TOTAL ASSETS</strong></td>
<td>$452,916.60</td>
<td>$430,235.69</td>
<td>$22,680.91</td>
<td>5.27%</td>
</tr>
</tbody>
</table>

### LIABILITIES & EQUITY

<table>
<thead>
<tr>
<th></th>
<th>2011</th>
<th>2010</th>
<th>$ Change</th>
<th>% Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>Opening Balance Equity</td>
<td>75,710.64</td>
<td>75,710.64</td>
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<td>0.00%</td>
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<tr>
<td>Retained Earnings</td>
<td>354,525.05</td>
<td>310,557.56</td>
<td>43,967.49</td>
<td>14.16%</td>
</tr>
<tr>
<td>Net Income</td>
<td>22,680.91</td>
<td>43,967.49</td>
<td>-21,286.58</td>
<td>-48.41%</td>
</tr>
<tr>
<td><strong>Total Equity</strong></td>
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<td>$430,235.69</td>
<td>$22,680.91</td>
<td>5.27%</td>
</tr>
<tr>
<td><strong>TOTAL LIABILITIES &amp; EQUITY</strong></td>
<td>$452,916.60</td>
<td>$430,235.69</td>
<td>$22,680.91</td>
<td>5.27%</td>
</tr>
</tbody>
</table>

VWEA will provide the FY10-11 audited financial reports to members after our annual audit is approved by the Board of Directors at its March meeting. Reports will also be available on the website.
2011 Income vs. Expenses

Like much of the economy, VWEA had a challenging year. We saw 5.5% income drop and a 3.6% increase in expenses from 2010. Part of the increase in expenses was due to cross-training of Administrative Staff. We also invested in updating the website, implemented on-line registration software, and promoted a sleeker, more modern Conduit. We spent more on travel for the Operations Challenge teams by sending additional teams, including returning champions Virginia Beach Terminal Velocity and Team HRSD. We made a strategic decision to improve Association communication in 2011 and we think the investment in our members and in communication will enhance VWEA’s value.

VWEA 2012 Calendar of Upcoming Training Events

Check out the master calendar on our website! [www.vwea.org/calendar](http://www.vwea.org/calendar)

<table>
<thead>
<tr>
<th>Training Event</th>
<th>Dates &amp; Location</th>
<th>Early Bird Rates</th>
<th>Contact hours</th>
</tr>
</thead>
<tbody>
<tr>
<td>Industrial Waste &amp; Pretreatment Seminar &amp; Workshop</td>
<td>March 5 &amp; 6, 2012</td>
<td>Member rate: $140</td>
<td>Earn up to 8.0 hrs for PWO &amp; 7.0 hrs for Engineers</td>
</tr>
<tr>
<td>Stormwater Webinar</td>
<td>Webinar</td>
<td>FREE</td>
<td>NA</td>
</tr>
<tr>
<td>Stormwater Lunch &amp; Learn</td>
<td>April 26, 2012</td>
<td>Member rate: $60</td>
<td>Earn up to 5 contact hours</td>
</tr>
<tr>
<td>Education Seminar</td>
<td>May 16 &amp; 17, 2012</td>
<td>Member rate: $140</td>
<td>Earn up to 8 contact hours</td>
</tr>
<tr>
<td>Operator’s Education Event</td>
<td>June 13 &amp; 14, 2012</td>
<td>Member rate: $175</td>
<td>Earn up to 8 contact hours</td>
</tr>
<tr>
<td>Good Lab Practices Workshop &amp; Seminar</td>
<td>August 6 &amp; 7, 2012</td>
<td>Member rate: $175</td>
<td>Earn up to 12 contact hours</td>
</tr>
<tr>
<td>Joint Annual Meeting (WaterJAM)</td>
<td>September 10-13, 2012</td>
<td>Member rate: $455</td>
<td>Earn up to 16 contact hours</td>
</tr>
</tbody>
</table>
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Contact us for the engineering details.
The National Association of Sewer Service Companies (NASSCO) has extended the deadline for Pipeline Assessment Certification Program (PACP) recertification from February 29, 2012 to August 31, 2012. “We want to make sure that everyone has the opportunity to become recertified before their PACP certification expires,” explained Ted DeBoda, PE, executive director of NASSCO, Inc. “One of our main goals is to maintain the highest possible standards for our industry. In order to maintain those standards, we realize that periodic reassessment of PACP knowledge is necessary to verify that competencies are maintained and users are familiar with updates made since their last training. We have worked hard to communicate the need to become recertified on our website, emails, and in multiple media outlets over the past several months, but we made the decision to extend our deadline in order to ensure that everyone has ample opportunity to remain PACP-certified.”

PACP certification is valid for three years. Recertification can be scheduled one of three ways:

1. Log onto nassco.org and self-register for the training through the course catalog.
2. Choose a PACP recertification course from the online training calendar or contact a master trainer in your area (list of upcoming training sessions and Master Trainers are on nassco.org).
3. Attend the two-day PACP course (as if you are a brand new user).

In addition to PACP users, trainer skills are now tested every two years, and include a knowledge-based exam, as well as an in-class evaluation by a NASSCO-certified master trainer.

Recertification cost is $175 for NASSCO member companies, and $225 for non-member companies. For more information or to schedule your recertification, visit www.nassco.org or email pacprecertification@nassco.org.

For questions or additional information contact Sheila Joy at 703-862-7217 or sheilajoy@newphasemarketing.com.

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Using Closed Circuit Television Inspection to Build an Asset Management Database

Background
The Prince William County Service Authority, located 30 miles south of Washington, D.C. in Virginia, is responsible for over 1,700 kilometers (1,100 miles) of gravity sanitary sewer. The Inflow and Infiltration Department (I&I), which is part of the Operations and Maintenance Division, is made up of 14 personnel. Led by a manager and supervisor, the department can divide into three or four crews depending on the job requirements of the day. In addition to operating three TV inspection vans, the I&I Department performs manhole repair/inspection and is actively involved in flow monitoring in various locations around the county. The department also oversees CIPP (cured-in-place pipe) and manhole rehabilitation performed by contractors. Also, all new sewer mains are inspected before bond release.
Until recently, reports for TV inspections were hand written. These reports were stored in files arranged by map page and manhole number. Video was recorded on VHS and BETA videotape. An individual work order had to be created for each line section inspected, which was time consuming for the crew leader.

Since the formation of the Service Authority, closed circuit television inspection has been performed without a comprehensive plan to make sure all gravity sewer mains were inspected on a regular basis. Specific areas were targeted in response to emergencies or high flows discovered during rain events. This created a practice of being reactive instead of proactive.

If a crew needed information about a particular line section, the report had to be manually located in the files and then matched with the correct videotape to view the area in question. This usually required the assistance of an I&I Department employee who understood how the filing system worked. Anyone who wanted to see reports or video had to come to the I&I Department. Reports were handwritten and sometimes difficult to read. There were also instances where reports were incomplete or difficult to understand, which resulted in the line section being inspected again. Reports and videotapes were occasionally misplaced, misfiled, or lost. The reports were also difficult to use as an assessment tool because of a lack of standardization for noting defects and other observations.

The I&I Department of the Prince William County Service Authority is inspecting over 700,000' of gravity sewer main per year using three crews.

A technician inspects sewer main using pipeline data collection software.

**Figure 1**

**Figure 2**
Upgrades
In 2007, the entire I&I Department became certified in PACP (Pipeline Assessment and Certification Program). All three TV inspection vans were upgraded with computers, and training was conducted in using the pipeline data collection software. Training was also conducted on importing and exporting data in the asset management software used by the Service Authority.

A standard operating procedure was developed for TV inspection of gravity sewer mains. This procedure standardized the information collected during inspections and how it is recorded. For example, during inspection, crews are instructed to verify as many lateral connections as possible and to note the address in the “Comments” line of the data collection software. This is accomplished by having the homeowner run water while the camera is at the tap or dumping water in a cleanout. Having this carefully documented, detailed information is priceless when responding to a backup or other problem that may require a quick response.

Productivity
In the years before the upgrades, the I&I Department was inspecting over 92,000 meters (300,000 feet) per year. With the implementation of the new procedures and data collection format, the department became more focused and began to target large areas for TV inspection. A goal of inspecting 153,000 meters (500,000 feet) per year was set in 2010, which represents 10 percent of the system. The objective was to inspect the entire system in 10 years.

Crews were initially skeptical regarding whether the benchmark was achievable. In the first full year, using three TV inspection vans, the I&I Department completed over 67,000 meters (720,000 feet) of sewer main inspection. Crews are now averaging 550 meters (1,800 feet) per day with a monthly average of 13,000 meters (45,000 feet). On most days at least two crews are performing inspection work. As a result of the crews’ performance, the goal has been raised to 213,000 meters (700,000 feet) per year, which will complete the inspection of the entire gravity sewer system in eight years.

TV inspections are arranged in groups using the Service Authority’s asset management software. The data file is transferred to the inspection van, then the completed inspections are transferred back into the asset management software. Work orders are completed automatically during the data import. Observations recorded in the field are accompanied by a JPEG photo (see Figure 1). Field crews spend far less time doing administrative work as a result of the new procedures. DVDs are only created if the line sections inspected are in need of repair, rehab, or bond release of new construction.

Asset management
As TV inspection continues, the database in the asset management software will continue to be updated. This information becomes available to anyone who has access to the database. Maintenance crews can now look up a line section to find lateral connections, possible defects, etc (see Figure 2).
Line sections can now be filtered by pipe type, PACP grade, and diameter (see Figure 3). This filtering capability assists in the planning and prioritization of rehabilitation work. The I&I Department currently has the goal of rehabilitating 14,000 meters (46,000 feet) of deteriorated sewers each year, using CIPP. The work will be accomplished utilizing private contractors. Sewer main rehabilitation projects are selected and justified using the PACP pipe grade calculations (see Figure 4).

The creation of work groups (i.e., lists of line sections with their attributes) in the asset management software provides for complete coverage of an area. This has already led to the discovery of main line breaks, lateral defects, and candidates for CIPP, which were previously unknown.

When one or two sewer main sections are inspected, because of emergencies or on short notice, reports are still filed manually. These reports are printed from the inspection van’s computer and use the proper PACP coding. While manual filing may never disappear, the amount of paperwork has been greatly reduced.

The not-too-distant future

The Service Authority is exploring the possibility of upgrading the van-mounted computer systems to laptops with docking stations. These laptops will have wireless connectivity to the authority’s network, giving field crews the ability to create and complete work orders from the field. Also, if a van should be down for service or repair, TV inspection work will not be delayed; the laptop can be moved to another van.

The Service Authority has just completed the first phase of a new GIS platform. Crews will be able to access sewer main (and other assets’) information related to TV inspections from the field. This new electronic link is expected to increase productivity by having information readily available to field personnel instead of requiring them to depending on personnel at the main office to look up and retrieve data.

As the I&I Department continues to build the sewer main database, more information can be pulled and organized to assist maintenance crews, engineering, and others in keeping the gravity sewer system of Prince William County working as efficiently as possible.
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The Lab Practices Committee (LPC) started the year’s activities on January 18 with a full committee meeting of approximately 25 members at the Henrico Water Reclamation Facility. The meeting included a technical presentation about The Use of Defined Substrate Technology™ for Testing Water Samples: What is a Number – MPN vs. CFU. Lunch was sponsored by IDEXX, a vendor member and supporter of LPC. Committee work included discussion of pending regulatory issues, and plans for our annual spring Meet-n-Greet social that is scheduled for March 18. We also discussed outlines for future newsletter articles and updates to the VWEA and VA AWWA websites.

The LPC held a special meeting on February 15 at the City of Norfolk Moores Bridges Water Treatment Facility. The assembled group reviewed plans for the workshops and the program of the 2012 VWEA/VAWWA Good Laboratory Practices Conference that is scheduled for August 6-7 in Charlottesville, VA. They also reviewed plans for the LPC Workshop on September 10 at WaterJAM in Virginia Beach, VA.

The Good Laboratory Practices Conference workshops will have something for every analyst, including drinking water microbiology, data quality assurance, and methods for meeting accreditation requirements. Wet chemistry methods, instrumental methodology, and troubleshooting will also be addressed in the workshops.

The keynote presentations will be given by two well-respected representatives of EPA Region III, Joe Slayton and Walter Higgins. The afternoon breakout sessions will cover a variety of analytical and quality assurance topics. These will include internal audits, quality systems, investigating whole effluent toxicity, automating ammonia with ISE, and the introduction of a hexavalent chromium and perchlorate methodology – to name a few.

Our LPC JAM workshop theme this year is What's New on the Horizon: Emerging Issues That Will Affect Your Quality System. The workshop will include five one-hour presentations ranging from drinking water regulatory updates from EPA and VDH to cost analysis and method development for specific emerging contaminants and understanding the legal and specialized criteria involved with laboratory hiring practices. We invite you to join us at our conference. Your time will be well spent as our conference holds something for everyone, such as continuing education, professional development, and networking opportunities, not to mention enjoyment.

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WE DESIGNED THE HRSD CENTRAL ENVIRONMENTAL LABORATORY 20 YEARS AGO AND IT’S BEEN AN EXCELLENT MODEL FOR MANY OTHERS SINCE.

We recently had to review those basic concepts, and what we’ve learned since, for a new laboratory in Kansas. An effective, efficient laboratory, operating at a reasonable cost within parameters set by the owner, determines: (1) quality control, (2) employee morale and retention, (3) operating costs, (4) maintenance costs, and (5) renovation costs for the next 30 years. For better or worse, a new laboratory building casts management concepts in stone.

Three early HRSD managerial decisions have proven nearly universal over 20 years. First, supervising chemists’ offices are clustered outside the laboratory area, not disbursed among the laboratory suites. Second, analysts or technicians have a small desk and personal workspace in the laboratories, not outside them (WSSC, north of Washington DC, been our notable exception out of dozens). Third, supplies are centralized for control and distributed daily on carts. Our sense in 1992 that the laboratory suites should be clustered for ease and efficiency of the utilities has held true over all the laboratories we have done and many we have seen. We occasionally see a laboratory with the hoods all in one room, ovens in another, refrigerators in another, and benches in another; a scheme we presume was for the design engineer’s convenience, not the staff’s.

ENVIROMENTAL LABORATORY DESIGN 2012

By Roger Fulton Newill, Architect, rnewill@rfnarchitect.com
One distinguishing characteristic of water and wastewater laboratories (compared, for instance, to petroleum, pharmaceutical, or medical laboratories) is that there are a dozen or more chemistries in one building, each often a contaminant of another, and many with very low detection levels. That causes a major energy problem, as “single pass air” is necessary to prevent the cross-contamination of recirculated air. After being heated or cooled, fresh air passes through each area only once and is then expelled. There is no recirculation, so it’s very expensive to condition all the air all the time. There are many concepts for lowering the laboratory’s energy cost, ranging from using the right kind of fume hoods to using city water or treated wastewater as the heat source (water to air heat pumps).

A second distinguishing characteristic of environmental laboratories is a high rate of technology change. We found, not long after HRSD, that new instruments, new protocols, and added analyses volume or types often cause water and wastewater laboratories to exceed their electrical capacity in a few years. By contrast, a new high school may be designed with perhaps 130% of its connected load (electrical use on day one), to allow for future loads, but we now ask our engineers to design for 250% of the connected laboratory load, since clients typically ask for 20- or 25-year service life for a new laboratory.

A third characteristic of environmental laboratories is that they need clean air: cleaner than many suburban and urban sites have. For example, the HRSD site had a lawn fertilizer company next door. After a careful review of wind direction and its chemical content and quantities, HRSD concluded it would not be a problem (as we found that fertilizer was not disbursed into the air). Since then, we’ve found that treatment plants are usually located on poor sites (sites with too much chlorine or nitrogen in the air, in a flood plain or on poor soil). In general, interstate sites are poor (too much nitrogen) along with pine forest sites (too much terpene and pollen in the air) and sites with high-tension lines (which can disturb instruments and wireless communications).

The three building characteristics discussed above, combined with a demand for increasingly skilled chemists and analysts who, in turn, seek a “desirable work environment” (laboratory-talk for “windows” and “daylight”), have led us to repeat many of the ideas in HRSD and add a few more. The ideas are relatively independent of each other and discussed in separate sections below.

Higher standards for mechanical systems were requested by HRSD and every laboratory we have designed since. Heating and cooling systems are designed to handle 99% of the days in a typical year, omitting the hottest and coldest 1%. In contrast, a high school not in session during the hottest months but in session during the winter might be designed for 88%: that’s a far lower heating and cooling load. Laboratory indoor norms are 20 to 21 degrees C, one to two degrees cooler than an office, with 50% humidity. Spaces containing Gas Chromatograph Mass Spectrometers (a common organic analysis instrument) are occasionally (and at HRSD) run at 14°C to achieve more accurate readings, as at HRSD. About 50% of these laboratories have temperature and humidity constantly displayed and recorded.

Modular laboratory suite design enables changes to the spaces and systems quickly and inexpensively as tasks and equipment change. A prototypical one- or two-man space is sketched, commonly with 12 to 15 linear feet of bench space on both sides, and the laboratory area is composed of those modules. They can be opened to each other for larger spaces and sometimes subdivided for smaller ones. The maximum reasonable load of sinks, hoods, air, electrical and water demands is established for each module, and the main mechanical system, tanks, pumps, etc. sized to deliver that to each module, even though each module may not always have the maximum load.

Each module is relatively independent of the others: it can only blow its own circuit breaker, it can have its water operable while another is shut off, and it can be enclosed for contamination or temperature control. Secondly, the main equipment in the building is large enough to handle the maximum future load, not just the initial expected load. Piping, ducting, and wiring are organized by module and can be found, understood, and reworked far more easily and inexpensively than a gerrymandered system. Lastly, even if a module does not initially need distilled water, the pipe is in the wall and the connection tee in place. (We have seen it take three days to locate the BOD suite water line in a laboratory designed with no consideration of the utility paths and inevitable renovation.)
Fume hood diversification can reduce the size and cost of the heating and cooling system and the annual energy bill. Just as all the electrical outlets in a house won’t be used at once, laboratory hoods are not likely to be sash-open all at once. If the laboratory manager is confident that only half the hoods will have their sashes 100% open at once, or all the hoods will have their sashes 50% open at once, the heating and cooling plant can be only half as big – a saving of about a half million dollars in constructing a small lab – and will operate far more efficiently than a heating and cooling plant twice as big operating at half capacity.

Fifty-foot-per-minute hoods are only made (as best we know) by Lab Crafters. Most fume hoods operate at an air speed of 100 feet per minute (fpm) through the open sash area. Over the last 10 years the same hoods have been described as energy efficient low volume (“low energy”) hoods, at 60 fpm, largely by reducing the open sash area size, but a smaller sash area is not as convenient for most work as a larger one. For the last 10 years we have used (not exclusively) Air Sentry hoods by Lab Crafters, and our clients’ results and the standard ASHRAE tests show the Air Sentry does roll the air up higher and faster inside the hood, using a slightly moving panel on the rear of the hood lining. Half as much air (50 fpm versus 100 fpm) removed by each hood means half as much outdoor air heated or cooled, half as big a heating system, and half as big an energy bill. 50 fpm hoods use 16% less air than 60 fpm hoods and have a full sash area. They didn’t exist when we designed HRSD, but automatic fan-reduction-when-sash-is-closed systems did and they’re also used on 60 and 50 fpm hoods.

Chinese hats originated in HRSD’s comments about the heat and odor of muffle ovens. Instead of a large steel box vent hood some distance above the ovens or incubators and often extending far to their left or right, taking in lots of room air and little oven air, we devised a sheet metal hat that sits right on top of the oven, about an inch above and around it, with a bigger opening in front where the door belches, and the air is ducted directly out of the laboratory. It’s fabricated after the oven is in place, so it fits closely and does a great job of taking heat, odor, or humidity immediately out of the room with a tiny exhaust fan.
Cantilevered benches are a concept that we didn’t know enough about to incorporate into the HRSD design. Thus, HRSD has fixed metal cabinets holding the bench tops up (the 100-year-old norm). We now know that half the laboratory managers in the country feel cabinets are simply expensive bench supports with a secondary role as laboratory equipment museums. They don’t want them. That feeling is more common in agricultural areas – the analytical load changes tremendously at harvest: dust, mud, pesticides, fungicides, vegetable peelings, wash water, ash, wax, oils, etc. are their fall-season analytical routine so they want to be able to change instrumentation, libraries, protocols, and supplies quickly – rolling carts under cantilevered benches. Cantilevered benches are simple to build, and yes, Corian countertops seem about as good as stone or other resins. Cantilevered benches also allow 30” height suitable for chair instead of stool seating, and with universal knee space.

Rolling carts seem to be a good idea: the Clark County (Las Vegas) laboratory has nothing but rolling carts – no fixed benches at all – and many of them were intended for auto parts shops: dozens of various-sized plastic buckets on each side for disposable supplies. The storage rooms have floor-to-ceiling shelves with the most common supplies at head-to-chest height, which are much more secure, easy to see, and easy to grab than in base or wall cabinets.

Horse stalls were invented (perhaps not for this purpose) in the Toledo, Ohio lab. Rust belt cities typically have combined flow and lots of in-stream samplers, and they are a serious cleaning problem. Starting with the Toledo laboratory, we often put a urethane-coated concrete block stall in the laboratory garage, with a little crane, pressurized steam, hot and cold water, and several drains, allowing all kinds of filthy equipment to be easily and thoroughly cleaned.

Glass instead of drywall between laboratory suites has been very popular. HRSD suggested it so their people could see each other and serve as incidental safety observers, and it was also a work-sharing incentive – it’s hard to look the other way when you can see that a colleague in the next room will obviously be at work until 10 p.m. – and other managers have felt the same.

Two substations serving the laboratory, in case a truck hits a power pole and that power line fails, have become a common request. This isn’t difficult for laboratories at treatment plants or industrial parks, which usually are served by two substations, but many labs without dual service access use an extended fuel supply for their emergency generators (48 hours instead of eight is common). Since 2002 we have tracked parameters of new environmental laboratories across the country to see what average is. We’ve found the national averages are (HRSD’s 2011 numbers are in parentheses):
The Young Professionals Community Service Event will be held Sunday, September 9 in Virginia Beach. This year’s event is being coordinated with Lynnhaven River Now, an organization committed to a healthy Lynnhaven River and watershed. All WEF members and their families are encouraged to come out and learn about the importance of this ecosystem while helping the restoration effort. Additional details to follow. For more information or to help sponsor this project, contact Laura Kirkwood at lkirkwood@hrsd.com or call 757-460-7086.

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Most recently, the Water Reach Committee has been assisting the Town of Tangier Island with several important projects including:

- Water system improvements (tank rehabilitation, new meters, reverse osmosis units).
- Wastewater treatment plant rehabilitation (replacement of rotating biological contactors, etc.).
- Refurbishment of the town’s incinerator (also located at the WWTP).

These projects are all scheduled for completion in early spring of 2012. The Water Reach Committee has been assisting Tangier Island for over 10 years and serves as their representative to provide advice and fill gaps that may arise between the contractors, engineers, and funding agencies. The committee was also instrumental in helping to secure a $2 million grant from the USDA Rural Development Agency, which helped make these projects possible.

Although the W/R committee will continue to provide assistance to Tangier Island, we are seeking new communities in Virginia to help. At present, we are looking into assisting the Town of Mineral with their sewer rehabilitation program. We are also considering another water project in southeast Virginia. If you have a project in your community with which assistance is needed, please let a committee member know. Better yet, we would be happy to have you join our committee and help us help you with your project.

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Falls from portable ladders (step, straight, combination and extension) are one of the leading causes of occupational fatalities and injuries. Several ways to reduce ladder fall risk are presented below.

- **THINK SAFETY FIRST!**
- Read and follow all labels and markings on the ladder.
- Avoid electrical hazards! Always look overhead before placing a ladder.
- Always inspect the ladder for deficiencies before using.
- Use a ladder only on a stable and level surface.
- Always face the ladder when climbing.
- Always maintain a three-point (two hands and a foot or two feet and a hand) contact on the ladder when climbing (see diagram).
- Do not use the top step/rung of a ladder as a step/rung unless it was designed for that purpose.
- Do not move or shift the ladder while a person or equipment is on it.
- A ladder used to access an elevated surface must extend at least three feet above the point of support. This also applies when using a ladder to access an excavation/trench of four feet or more in depth. Do not stand on the top three rungs.
- The proper angle for setting up a ladder is to place its base a quarter (1/4) of the working length of the ladder from the wall or other vertical surface.
- Be sure that all locks on a ladder are properly engaged.
- Be aware of the ladder’s load rating and of the weight it is supporting, including the weight of any tools or equipment and do not exceed the maximum load rating.
- **THINK SAFETY FIRST!**
The Virginia General Assembly spent a great deal of time and generated a great deal of controversy wrangling over social issues this year. Of course, the budget has also generated much controversy and an impasse may continue right up to the June 30 deadline for having a budget enacted. Additional funding for the Water Quality Improvement Fund (WQIF) may not be determined until the final budget is approved. SB 494, which would have authorized the issuance of additional bonds to help finance the Water Quality Improvement Fund (WQIF), was continued until 2013.

The General Assembly did, however, agree on passage of Nutrient Trading Act (SB77/HB176) by a final vote of 40-0 in the Senate and 98-0 in the House. The Nutrient Trading Act was needed to implement Virginia's Watershed Improvement Plan (WIP) as part of the Chesapeake Bay Total Maximum Daily Load (TMDL) process. If Virginia fails to implement its WIP, the federal EPA has threatened to take so-called backstop actions that could have very negative impacts on point sources in the Commonwealth.

The Nutrient Trading Act's preamble states: § 10.1-2700. Legislative findings and purposes. The Virginia Watershed Implementation Plan for the Chesapeake Bay Watershed establishes allocations for nitrogen, phosphorus, and sediment delivered to the Chesapeake Bay and its tidal tributaries to meet applicable water quality standards and a plan for significant additional reductions of such pollutants to meet such allocations. The General Assembly finds and determines that expansion and utilization of Virginia’s market-based trading program will assist in (i) meeting these cap load allocations cost-effectively and as soon as possible, (ii) accommodating continued growth and economic development in the Chesapeake Bay watershed and Southern Rivers watersheds, and (iii) making reasonable further progress toward implementing Virginia’s Watershed Implementation Plan at the local level.

SB77 allows trading between point and non-point sources. Non-point sources include Municipal Separate Stormwater Systems (MS4), land developers, agriculture, combined animal feeding operations (CAFO) and private credit providers. The Department of Conservation and Recreation (DCR) is given primary responsibility for developing regulations for expanded trading and organizing a registry to track all credit transactions. DCR is directed to coordinate the program and regulations with the Department of Environmental Quality (DEQ) where the programs might overlap. DEQ has responsibility for the issuance of point source permits (VPDES permits).

Virginia already had a highly regarded point source trading program in place. The Virginia Nutrient Credit Exchange Association, Inc. (The ExChange) manages that program on a volunteer basis for approximately 107 of the 127 significant dischargers in the Chesapeake Bay watershed. SB-77 greatly expands the number and types of players that may be involved in nutrient trading in Virginia.

After DCR and DEQ issue new regulations for the expanded trading program, new challenges and opportunities will present themselves to facilities. MS4 permit holders may seek credits from point sources, particularly those within the same county or city. Private firms may offer credits to point sources or compete for MS4 and developer required credits.

It is not possible to predict how the market will work, how credits will be priced or the time frames for transactions. The ExChange intends to continue to develop rolling five-year plans for point sources; but, flexibility to meet changing conditions will be critical. It will be even more important that facilities understand the trading options available and fully understand their costs in order to participate in the market in an optimal manner.

Other legislative actions included: HB 186, which would have allowed localities to prohibit land application of sewage sludge. HB186 was continued until 2013, at which time it could again be considered.

SB 509 (Wagner) State Water Control Board regulations would have required “that state water quality laws be no more restrictive than federal requirements.” Currently, Virginia law allows more stringent regulations than those adopted by the federal government, so long as the reasons for the more restrictive provisions are disclosed to the committees having oversight responsibilities. SB 509 was stricken at the request of the patron.
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This award recognizes an individual(s) who has shown extreme dedication to the area of sewer collection systems. The dedication is evident by the focus on training and promotion of collection systems personnel to enhance the personnel’s knowledge and ability to operate and maintain collection systems. Strong leadership has been evidenced by the presentation of collection system papers and the advancement of new technology in the collection systems field. The individual has shown continued interest and work in the local WEF association in the collection systems field.

The Golden Manhole Award is intended to recognize those individuals who are significant contributors to the advancement of the systems design, education, training, certification, construction, operations, maintenance, and management of wastewater collection systems. This award provides permanent recognition of efforts that promote professionalism and pride among those involved in collection systems activities.

This award has been approved by the Water Environment Federation as a way to recognize those who have contributed to the development and professionalism of the collection system industry on a national level. It is the desire of the federation that each member association adopt this award, which would be given on the member association level. The state criteria for the award will reflect the WEF-approved criteria.

NOMINATIONS ARE DUE MAY 15 OF EACH YEAR.

Criteria for the Golden Manhole Award will be three or more of the following:
1. Years of experience and significant accomplishments in the design, education, training, certification, construction, operations, maintenance, safety, or management of wastewater collection systems.
2. Innovative solutions to problems.
3. Presentations and/or participation at conferences.
4. Involvement in promoting the professional recognition of the collection systems field.
5. Papers or articles accepted by state, regional or national publications.
6. Membership in WEF national collections system committee.
7. Membership in good standing with the VWEA.
8. Active involvement with the VWEA Collection System Committee.
9. Any other reason why the Nominee deserves recognition.

Previous Award Recipients:
Peter Fortin, PE – 2002
Christopher S. Garrett, PE – 2002
Paul A. Shoop, PE – 2003
Federico Maisch, PE – 2006
VWEA Golden Manhole Award Nomination Form

<table>
<thead>
<tr>
<th>NOMINATOR CONTACT INFORMATION</th>
<th>NOMINEE CONTACT INFORMATION</th>
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<tbody>
<tr>
<td>Name</td>
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<td>Telephone Number</td>
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Attach a one-page sheet with a list of the significant contributions the candidate has made that promote professionalism through the advancement of the systems design, education, training, certification, construction, operations, maintenance, and management of wastewater collection systems field. Please provide additional attachments and information as necessary.

If you would rather speak to a committee member about your nominee than write below, please ensure contact information is provided above and indicate below to call you. Be prepared to provide specific examples of the nominee’s commitment and contributions to our field.

DEADLINE  May 15 of each calendar year

INSTRUCTIONS
1. All nomination forms and all attachments must be submitted electronically by email.
2. Nominators must use the attached form. Other formats will not be accepted.
3. Nominations shall be submitted to the named representative of the section by May 15.

REQUIREMENTS  Significant participation in one or more of the following areas: operation, maintenance, design, education, training, certification, management, and planning of wastewater collection systems. See the criteria referenced above.

EVALUATION CRITERIA  Award will be decided by a vote of the Collection System Committee. The committee will use the above referenced criteria to select the recipient.

SUBMIT TO  Tim Slaydon, Collection System Committee Chair
tslaydon@wileywilson.com
804-254 6671

QUESTIONS, PLEASE CALL  Chris Wilson 757-518-2704
cwilson@Brownfld.com
The goal of the Collection Systems Committee (CSC) is to improve the quality of the operation and maintenance of wastewater collection and interceptor systems by (1) improving professionalism, (2) providing training, and (3) encouraging the exchange of information and ideas among collection systems personnel. Specific committee sponsored events/activities scheduled for this year include:

- A NASSCO training opportunity for Virginia engineers and operators to learn or refresh their knowledge of PACP, MACP, and LACP condition assessment. This training event is held on an annual basis with the next training session planned for summer of 2012.
- Participation by committee members in WaterJAM as session moderators for the Collection Systems presentations.
- The resurrection of the Golden Manhole Award and the solicitation of nominees for it. Nominees must be active VWEA members who work in the operation, maintenance, repair or design of wastewater collection and interceptor systems. If you have a candidate in mind, please contact CSC Chair Tim Slaydon at tslaydon@wileywilson.com for a nomination form. A copy of this form can also be found on page 43 of this issue.

The Collection Systems Committee (CSC) meets regularly on the first Tuesday of each month (via conference call) to plan upcoming events and projects. We are currently developing concepts for a JAM workshop session. If you would like information on any of the events listed or to join the committee, please contact me at: cwilson@BrownCald.com.

George Mason University Social

The Student Activities Committee of George Mason University (GMU) recently held a social at Brion’s Grille in Fairfax, VA to generate interest in our organizations and to encourage the further development of student chapters at the university. The February 9 event was well attended. There were 10 students and seven professionals who helped promote our cause. Following a presentation about WEF and an overview of the SAC activities; all of the students joined WEF. The social was a huge success in that, in addition to gaining members, we created a joint chapter with Engineers for International Development at GMU.

We owe our thanks to Josh Hicks, who is heading the GMU chapter and to the Faculty Advisor, Dr. Barry Liner. Special thanks also go to Bob Forgione, John Mcgettigan, Jimmie Jenkins, Farah Foster, Ange Roeske, and Phill Yi for talking to the students about WEF and encouraging them to be active in WEF; keep up the good work!

2012 Scholarships

Your Student Activities Committee (SAC) is pleased to announce the VWEA scholarships available for the year 2012. We look forward to receiving applications for the following scholarships:

VWEA Sonny Roden Memorial Scholarship: Three awards in the amounts of $1500, $750 and $250 will be given out to graduate students from universities and colleges in Virginia.

Please see the VWEA Student Activities Committee websites for additional details about and applications for these scholarships.

Thank you and we look forward to your applications!
The vision of Water For People is a world where all people have access to safe drinking water and sanitation; a world where no one suffers or dies from a water- or sanitation-related disease. The VAAWWA/VWEA Water For People Committee has supported this vision by raising awareness and funds for international programs. In 2011, the committee sponsored the annual Water For People Herb Evans Memorial Golf Tournament and raised over $21,000 that was donated to support Water For People programs in 11 regions located in Africa, Asia, Central America, and South America.

Water For People is dedicated to helping establish the foundations for water and sanitation. It is our belief that everyone in the regions where we work should have access, regardless of economic or social status. For us, success means that water flows for every family, every school and every clinic and that latrines are used by all. When Water For People began work during 2007 in the Chinda region of Honduras, none of the fourteen communities met government standards for water quality and most people did not have improved sanitation. The organization began training programs to help community water committees administer and maintain water systems and helped develop water-metering solutions. It also worked with parent-teacher associations to develop integrated community and school sanitation and hygiene programs. In 2011, after four years of work in the region, Chinda achieved complete water supply and sanitation coverage for homes and schools.

The Water For People Committee wants to again thank its generous sponsors and donors. The 2012 Water For People Herb Evans Memorial Golf Tournament is scheduled for May 16, 2012 at the Golden Horseshoe Golf Club in Williamsburg, the Hanging Rock Golf Club in Salem and the Bull Run Golf Club in Haymarket. Please join us again this year as we strive to make a difference in the lives of people worldwide. Register online at http://www.regonline.com/2012WFPherbevannmemorialgolfclassics.

For additional information on individual courses please contact the following:

Golden Horseshoe Golf Club (Green Course):
Andy Landrum, 757-599-5101 or email atalandrum@wallp.com

Bull Run Golf Club
Geronimo Balallo, 804-756-7789 or email atGeronimo.BALALLO@infi codegremont.com

Hanging Rock Golf Club
Aaron Tice at 434-455-3210 or email atatice@wileywilson.com

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For more information, please visit www.ghd.com
The Industrial Waste and Pretreatment (IW&P) Committee saw the successful culmination of nine months of planning and coordination on March 5 and 6 when they held their 28th Annual IW&P Workshop and Seminar at the Charlottesville DoubleTree. Twenty-three suppliers, consultants, and laboratories exhibited during both days and nearly 140 individuals attended the seminar, which offered up to 5.0 CEUs.

What Flows around Comes Around – Water Reuse was the theme of the workshop held on Monday. During the workshop over 100 attendees heard several key leaders in the field of water reuse present topics describing progress in water conservation and waste reduction by way of treatment and reuse. Valerie Rourke, the Water Reclamation and Reuse Coordinator for DEQ, presented recent water reuse accomplishments within the Commonwealth. Leita Bennett, Atkins Global’s national project manager for water reuse initiatives, shared her experiences throughout industry and the regulation community. Lucy Pugh, Vice President at AECOM, presented two case studies involving water reuse success at a petroleum refinery and an automotive engine plant. Similarly, Steve Pierett, Environmental Manager for Volvo Trucks manufacturing in Dublin, Virginia, shared the details of water use, wastewater generation, and successful reuse of treated wastewater. Licensed plant operators and registered professional engineers were able to obtain up to 3.0 continuing education credits for license renewal.

Tuesday was devoted to a variety of wastewater pretreatment topics. These included an EPA Office of Water update on water reuse strategies by Senior Environmental Scientist Robert K. Bastian, and a DEQ update by Fred Cunningham of DEQ. Deborah DeBiasi, also of DEQ, updated attendees on the emergence of microconstituents in the environment and the impacts to the regulated community. Mark Richards briefed attendees on the DEQ PCB River Study and what it means to the future. Scott Flanagan of Chesterfield County Water described their efforts to combine industrial stormwater inspections with municipal stormwater inspections. Other presentation topics included dissolved air flotation (DAF) process, pretreatment of landfill leachate, upcoming regulatory challenges, TMDL development, and membrane bioreactors.

Following the awards, IW&P Chairman, Jim Johnston, extended his sincere appreciation to the committee members, thanking them for their hard work in bringing the event to fruition. Planning for the 2013 workshop and seminar will begin in June. The IW&P Committee can always make room for more industrious and energetic committee members from any sector, private or public. To join the team, contact the chair, Jim Johnston, at 540-662-7097 or via email at johnston@scsengineers.com.
### LISTINGS BY CATEGORIES

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<tr>
<th>Category</th>
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<td><strong>Activated Carbon</strong></td>
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<td><strong>Collectors</strong></td>
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<td><strong>Odor Control</strong></td>
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<td><strong>Process Mechanical</strong></td>
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<td><strong>Pump Stations &amp; Meter Vaults</strong></td>
<td>Envirep/TLC, Johnson, Mirrnan &amp; Thompson (JMT), O’Brien &amp; Gere</td>
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Residuals/Waste Management
Crowder Construction Co.
Degremont Technologies

SCADA Screening Equipment
Buchart Horn, Inc.
ClearWater, Inc.
Sterling Engineering Solutions

Sewer Flow Monitoring (Sanitary, Storm & CSO)
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CDM Smith
Goel Services, Inc.

Sewer System Evaluation
Gannett Fleming, Inc.

Smoke Testing
Goel Services, Inc.
Video Pipe Services

Storage Tanks/Reservoir Systems
Kimley-Horn and Associates, Inc.
Oldcastle Precast
Pittsburg Tank & Tower Maintenance Co.

Stormwater/Water Quality
Gannett Fleming, Inc.

Tank Inspection/Maintenance
Pittsburg Tank & Tower Maintenance Co.

UV Disinfection
Calgon Carbon Corporation
TrojanUV

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Amwell Inc.
Sherwood-Logan & Associates, Inc.

Water Distribution Systems
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Malcolm Pirrie,
The Water Division of ARCADIS

Water Quality Monitors
Sterling Engineering Solutions

Water Resources
Draper Aden Associates

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CDM Smith
CH2M Hill
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Greeley and Hansen
Hazen and Sawyer, PC
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Johnson, Mirmiran & Thompson (JMT)
Kimley-Horn and Associates, Inc.
O’Brien & Gere
Wiley | Wilson

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ClearWater, Inc.
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703-376-5000
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- **VWEA Logo Polo Shirts**
  - Women’s sizes S-2XL
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- **Hats**
  - Washed Chino Cotton Caps
  - Colors: Navy & Putty
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Contact Kathy at admin@vwea.org to place an order.

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  - 11420 Old Baltimore Pike
  - Beltsville, MD 20705
  - 301-931-0707
  - jterpak@videopipeservices.com
  - www.caryloncorp.com

- **Wendel**
  - 1420 King St.
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  - 703-299-8718
  - acasolini@wendelcompanies.com
  - www.wendelcompanies.com

- **Whitman, Requardt & Associates, LLP**
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  - Norfolk, VA 23502
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  - randy.grubbs@hdrinc.com
  - www.hdrinc.com

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  - Glen Allen, VA 23060
  - 804-965-0086
  - jchastain@heywardinc.com
  - www.heywardinc.com

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  - 272 Bendix Rd., Suite 260
  - Virginia Beach, VA 23452
  - 757-499-1895
  - bberinger@jmt.com
  - www.jmt.com

- **Kimley-Horn and Associates, Inc.**
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  - Reston, VA 20191
  - 703-674-1300
  - tammy.jencen@kimley-horn.com
  - www.kimley-horn.com

- **Malcolm Pirnie, The Water Division of ARCADIS**
  - 3101 Wilson Blvd., Suite 400
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  - 703-351-9100
  - Robert.bolton@arcadis-us.com
  - Arcadis-us.com

- **Michael Baker Jr., Inc.**
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  - 757-631-5442
  - khughes@mbakercorp.com
  - www.mbakercorp.com

- **O’Brien & Gere**
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  - farah.foster@obg.com
  - www.obg.com

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  - 703-351-9100
  - Robert.bolton@arcadis-us.com
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- **Michael Baker Jr., Inc.**
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When used with our patented Expanda-Seal™ technology, Shand & Jurs’ Conservation Vents limit flows to less than 0.5 SCFH at 95% of the set point. Installing a weight loaded Emergency Vent/Manhole Cover on a fixed digester provides supplemental pressure/vacuum relief in emergency situations. Limit Switch Assemblies, which send a signal to notify when the vent is relieving, are available on both pressure/vacuum Conservation Vents and Emergency Vents.

Designed to be installed in piping systems, the Foam Separator removes foam by spraying the gas/foam mix with water as the biogas flows through the system, protecting equipment downstream such as boiler/heat exchangers, engine-generators, or Waste Gas Burners/Flares utilized to safely dispose excess gas.