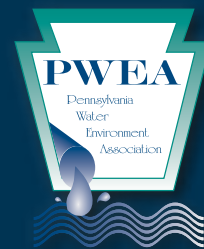


# KWQMA

## KEYSTONE WATER QUALITY MANAGER



The Magazine for Pennsylvania Water Quality Professionals



# Stormwater

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**EMERGENCY  
PREPAREDNESS  
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PRETREATMENT**



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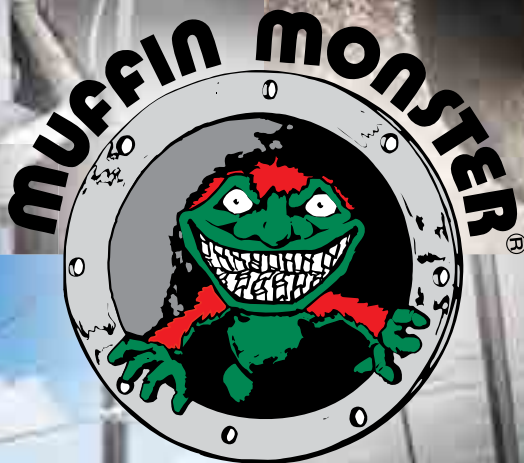
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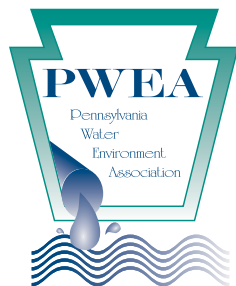
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# KEYSTONE WATER QUALITY MANAGER

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# KWQM

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## MISSION STATEMENT

*Enhance the knowledge and abilities of Pennsylvania's water quality professionals, promote sound sustainable water policies, and promote public awareness of the need to protect water resources.*

## DEADLINES FOR MAGAZINE INFORMATION

### JULY/AUGUST/ SEPTEMBER 2015

April 10, 2015 editorial board meeting\*  
May 15, 2015 advertising deadline

Editorial Committee meetings are held at the CDM Smith Harrisburg office at 3605 Vartan Way, Suite 202, Harrisburg, PA 17110.

If you would like to submit articles or advertising for the *Keystone Water Quality Manager*, please forward to the following:

**Articles:** Brian Lubenow, Editor,  
[pweaeditor@gmail.com](mailto:pweaeditor@gmail.com).

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# KWQM KEYSTONE WATER QUALITY MANAGER

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Julianne Stile (Camp Hill)

## EDITORIAL COMMITTEE

*An active member of the editorial committee must participate in production of at least one issue of the KWQM or e-newsletter each fiscal year. Participation may include any or all of the following: reviewing and editing articles, contacting contributing authors, soliciting articles/announcements or advertising, and/or other tasks related to magazine production as defined by the editor.*

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Conference & Meetings Manager: Cindy Rock, 570-549-2204, Workshops, Annual Technical Conference, exhibit arrangements, and award coordination.

Meeting dates for the Editorial Committee are indicated in the left hand column of this page. Meetings begin at 10:00 am, at CDM Smith Harrisburg office at 3605 Vartan Way, Ste 202. If you would like to become a member of this committee, contact the Editor.

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# Stormwater in Focus



**BRIAN LUBENOW**  
**EDITOR**

It's possible you missed the article in the third quarter issue of the KWQM last year titled "Introducing PWEA's Newest Committee..." The Stormwater Committee," but there's no excuse for missing the Stormwater Committee's presence in this issue! Since its inception less than three years ago, the Stormwater Committee has become one of the largest and most active PWEA committees. Committee members presented two sessions at the 2013 and 2014 PennTec conferences and held a sold-out workshop last fall. With this issue, it looks like they have no intention of slowing down in 2015 and beyond.

Last year when the Editorial Committee was considering publishing two themed issues in 2015, the Stormwater Committee immediately stepped up to provide content for one of these issues. The response from the committee was impressive, providing more information than we could fit into this issue. My thanks to Jared Hockenberry (Chairperson) and Jeff Cantwell in leading this effort.

I trust you'll enjoy the wide-ranging perspectives offered in this issue, focused on the increasingly complex stormwater and water quality issues facing our industry and communities today. 💧

**Brian Lubenow, PE, BCEE**  
Editor

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# The Best Is Yet to Come



**DANIEL B. SLAGLE**  
**PWEA PRESIDENT**

**"ALL OF PWEA'S COMMITTEES AND THE SECTIONS HAVE WORKED TIRELESSLY TO PROVIDE MEMBERS AND NON-MEMBERS WITH COUNTLESS OPPORTUNITIES TO ENHANCE THEIR KNOWLEDGE AND PASSION FOR WATER QUALITY AND THE ENVIRONMENT."**

One of my favorite artists is Frank Sinatra who sang "The Best Is Yet To Come." It's hard to believe that a year has already passed. PWEA always reminds me of that quiet duck sitting peacefully on the pond but underneath, his little legs are going to beat the band which typifies Sue Boynton and Cindy Rock, who keep PWEA running smooth. All of PWEA's committees and the sections have worked tirelessly to provide members and non-members with countless opportunities to enhance their knowledge and passion for water quality and the environment. The breadth of knowledge and educational opportunities that PWEA offers its members is staggering. PWEA has accomplished so much over the last 12 months – a newly elected editor; a new publisher; a redesigned magazine; revised bylaws; a new Utility Partnership Program; new Public Education Committee flyers; a new format for the Annual Conference; a Job/Career Fair at PennTec; a new Engineering & Construction Committee; new Position Statements; an expanded broadcast database; initiated parallel organization partnerships; redesign of PWEA's website; increased interaction with the PaDEP; an updated Policy & Procedures Handbook; planning for a 2016 regional WEFMAX meeting; and a Strategic Planning session. In addition, and most importantly, expanded and broadened educational opportunities for members and non-members, as well as offering numerous dates and locations for operator certification exams.

The PWEA/Section Joint Summit held in December was a great success, much to the continued efforts of Mike Kyle, Carl Janson, and Dean Miller who provided PWEA and Section leaders with that all important historical perspective. The impact and suggestions received at this Joint Summit from the section leaders is invaluable toward shaping PWEA as we move forward to better serve our members. PWEA's database of members and potential members more than quadrupled as we spread our wings to reach out to more and more professionals. Updating our bylaws and operating handbook was a huge undertaking by John Schon and our Past President Art Auchenbach. PWEA's revised bylaws were reviewed by the PWEA Board of Directors, as well as the Water Environment Federation. By the time you read this, the bylaws will have been approved by the Board of Directors and presented to members at the Annual Business Meeting for a vote by members in attendance. We are currently reaching out to universities, colleges and high schools to acquaint students with PWEA and PA sections – this enthusiastic group of students contain future water quality professionals. PWEA firmly

believes the association's continued success lies with passing knowledge and passion for water quality and the environment on to the younger generations. We are currently establishing an Executive Committee Liaison Policy to strengthen committee involvement and ensure prompt coordination in getting their efforts delivered to members and non-members.

PennTec 2015 in Lancaster will offer an amazing opportunity for operators, managers/superintendents, professors/student, PaDEP staff, engineers and manufacturers' representatives to gain useful knowledge related to water quality and the environment. The tremendous range of topics will offer something of interest for everyone. The networking events will give attendees an opportunity to interact with a diverse cross-section of professionals to share experiences and shortcuts that make us more efficient in the workplace. The Conference Committee, Chaired by Brian Book, along with PWEA committees and staff, have been working hard produce a successful conference. If you aren't able to attend PWEA's annual conference in 2015, PennTec 2016 will be held at the Penn Stater Conference Center June 5-8.

As the song goes, "The Best Is Yet To Come." PWEA's incoming President, Brian Book, brings with him a great perspective of the association and its committees, a vision and enthusiasm that will continue to keep PWEA on the cutting edge through his passion for water quality and the environment. PWEA's members will continue to face challenges regarding water quality and the environment from new and ever-changing economic and regulatory uncertainties. PWEA is both strategically and intellectually poised to provide its members, as well as non-members, with the knowledge and opportunities to tackle this ever-changing environment.

I want to personally thank our members and their employers for their continued support and involvement in PWEA and our sections. The strength of PWEA lies solely with the vast knowledge of our membership and countless hours expended by our Board of Directors and committee members. Just remember "THE BEST IS YET TO COME." ♦

Sincerely,

**Daniel B. Slagle, P.E.**  
PWEA President





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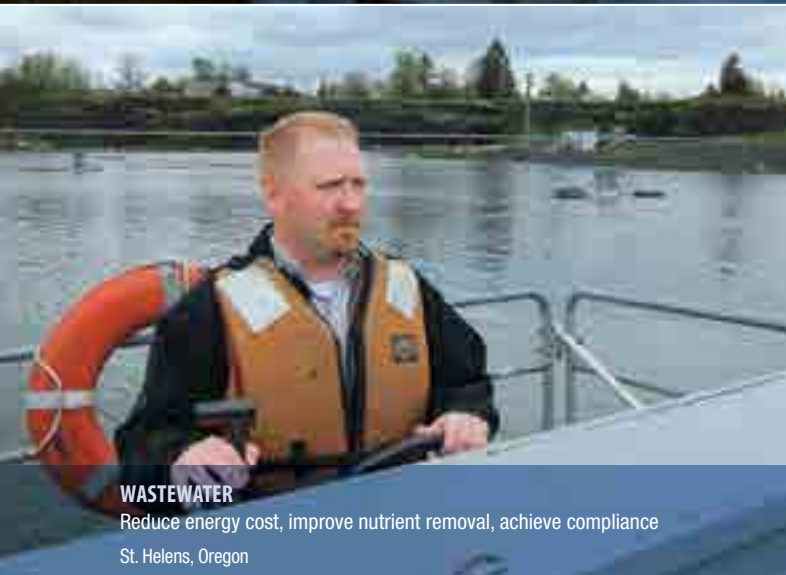
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## PWEA MEMBERSHIP & SPONSOR REPORT 4TH QUARTER 2014

### AS OF DECEMBER 31, 2014

Total PWEA-Only Members: 488

Total WEF/PWEA Members: 1178

### JANUARY 1 - DECEMBER 31, 2014

#### Sponsor Name New Member

David Brown .....Michael Gavulic (PWEA)

Diane Fox .....Mike Orris (PWEA)

William Hill .....Larson Wenger  
(WEF/PWEA)

Chase Kelch .....Robert Bastian  
(WEF/PWEA)

Randy Kreider .....Curt Wilbern (WEF/PWEA)

Dale Lyles .....Mark Mesiarik (PWEA)

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James Broker (PWEA)  
Jared Dreistadt (PWEA)

M. John Schon .....Kimberly Moran  
(WEF/PWEA)

Mary Beth Smarach  
.....Norman Stout (PWEA)

The PWEA Race for Recruitment runs from January 1 through December 31. All sponsors must be current PWEA members to participate. The 2014 Membership Recruitment Award will be presented at the 2015 PennTec Annual Dinner and Awards ceremony. In the event of a tie, the award will be divided equally.

## TIMOTHY CARN JOINS NAVARRO & WRIGHT CONSULTING ENGINEERS, INC.



TIMOTHY A. CARN, RPA

Navarro & Wright Consulting Engineers, Inc. is pleased to announce that archaeologist Timothy A. Carn, RPA, has joined the firm's Cultural Resources Group. His arrival enhances the firm's ability to respond to a growing workload in the Cultural Resource disciplines. Timothy Carn comes with experience in field, laboratory, and collection settings, and has particular strengths in developing and coding digital cataloging systems.

Tim joins Navarro & Wright as a Field Director, and will immediately provide field supervision as the firm embarks on an aggressive schedule of archaeological excavations planned for the advancement of transportation and telecommunication projects in several parts of Pennsylvania. He will also apply his expertise in organizing and archiving archaeological collections as these projects leave the field and enter the lab.

Paul J. Navarro, President and Chief Executive Officer, said "Cultural Resource work has been a staple of our firm's service portfolio since 2008, and we anticipate growth in this service sector in 2015 and beyond. The increasing demand from our teaming partners led us to look for an addition to our team who shares our passion for the work, and our commitment to providing quality service. Tim will be an important contributor to these goals."

Timothy Carn joins a senior Cultural Resources staff that also includes Cultural Resource Team Leader Alan D. Beauregard, Senior Archaeologist Richard A. Geidel, Architectural Historian Alison Ross, and Preservation Architect Leila Hamroun. ♦

**"THE INCREASING DEMAND FROM OUR TEAMING PARTNERS LED US TO LOOK FOR AN ADDITION TO OUR TEAM WHO SHARES OUR PASSION FOR THE WORK, AND OUR COMMITMENT TO PROVIDING QUALITY SERVICE."**

## EPWPCOA NEWS

To receive additional information on the Eastern Pennsylvania Water Pollution Control Operators Association, Inc. (EPWPCOA) visit [www.epwpcoa.org](http://www.epwpcoa.org). View the EPWPCOA website calendar for activities and training event announcements and to download registrations forms. Check us out on Facebook, Twitter and LinkedIn.

Please contact Marykay Steinman, EPWPCOA Executive Director, at (610) 670-6072 or [epwpcoa@ptd.net](mailto:epwpcoa@ptd.net) for more information.

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## BRUCE R. HULSHIZER, P.E., JOINS HRG'S WATER & WASTEWATER TEAM



BRUCE R.  
HULSHIZER, PE

**H**erbert, Rowland & Grubic, Inc. (HRG) hired Bruce R. Hulshizer, PE, as a water and wastewater project manager in their Harrisburg, PA office.

Hulshizer joins HRG's Water & Wastewater Service Group with two decades of civil engineering experience. In his new role with the firm, he is responsible for the management of water and wastewater infrastructure projects including planning, permitting, design, construction administration, financial analyses, and project financing.

"We are excited to add Bruce's valuable skill set to our team. His proven ability to manage large-scale projects coupled with his diverse technical knowledge make him a tremendous asset to HRG and our clients," stated Andrew M. Kenworthy, PE, Eastern Region Vice President.

Hulshizer earned his master's degree in civil and environmental engineering and a bachelor's degree in civil engineering from Lehigh University. He is a registered professional engineer in Pennsylvania. In addition, he is an active member of the Pennsylvania Water Environment Association and currently serves as their co-chair of the Collection System Committee. ♦

## MCBRIDE ENHANCES WADE TRIM WATER RESOURCES GROUP



JASON MCBRIDE, PE

**J**ason McBride, PE, joined Wade Trim's Water Resources Group in Pittsburgh as a Senior Project Manager where he will provide wet weather and wastewater collection system engineering services to clients. His primary role will be working on wet weather projects for combined sewer overflow (CSO) and sanitary sewer overflow (SSO) facilities including wastewater treatment plants, high rate treatment facilities, large diameter tunnels and pump stations.

McBride brings 14 years of experience in planning, design and construction phase services with an emphasis on CSO long term control plans and SSO capital improvement plans. He seeks opportunities to incorporate sustainable design, green infrastructure, and low impact development into regional wet weather plans to maximize economic, social and environmental benefits. In addition, he serves as a board member for the Nine Mile Run Watershed Association and holds a BS degree in Environmental Systems Engineering from Pennsylvania State University.

Wade Trim has more than 330 professional and support staff in 18 offices throughout Michigan and seven other states. They provide engineering, surveying, landscape architecture, planning, operations, and construction services for transportation, water resources, private development and municipal government projects. ♦

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## CALENDAR OF EVENTS

To receive additional information on the Eastern Pennsylvania Water Pollution Control Operators Association, Inc. activities, see our website at [www.epwpcoa.org](http://www.epwpcoa.org). Join us on Facebook, Twitter and LinkedIn.

### THURSDAY/FRIDAY, APRIL 15/16, 2015

EPWPCOA Workshop "Processing Biosolids in the Waste Treatment Plant"  
Contact: MaryKay Steinman, 610-670-6072

### FRIDAY, APRIL 17, 2015

WPWPCA Plant Tour/Meeting  
Emerson Process Management  
Pittsburgh, PA  
Visit [www.wpwpc.org](http://www.wpwpc.org) for information

### THURSDAY/FRIDAY, APRIL 23/24, 2015

EPWPCOA 24th Annual Industrial Waste Pretreatment Conference  
Contact: MaryKay Steinman, 610-670-6072

### TUESDAY, MAY 5, 2015

PWEA Industrial Waste Pretreatment Committee Workshop  
Cranberry Township, PA  
Contact: Cindy Rock, 570-549-2204

### THURSDAY, MAY 7, 2015

EPWPCOA Collection Systems Committee Workshop  
Contact: MaryKay Steinman, 610-670-6072

### FRIDAY, MAY 8, 2015

CPWQA City of York Plant Tour and Business Meeting  
Contact: [info@cpwqa.org](mailto:info@cpwqa.org) for information

### FRIDAY, MAY 15, 2015

EPWPCOA Regular Meeting, Vendor Exhibition, Technical Presentation, Business Meeting  
Contact: MaryKay Steinman, 610-670-6072

### FRIDAY, MAY 15, 2015

WPWPCA Plant Tour/Meeting  
Mitsubishi Electric Power Products  
Cranberry Township, PA  
Visit [www.wpwpc.org](http://www.wpwpc.org) for information

### SUNDAY-THURSDAY, MAY 31-JUNE 3, 2015

PWEA Annual Technical Conference (PennTec)  
Lancaster Marriott/Lancaster County Convention Center  
Contact: Cindy Rock, 570-549-2204

### TUESDAY, JUNE 2, 2015

PWEA Industrial Waste Pretreatment Committee Meeting  
Contact: Cindy Rock, 570-549-2204

### TUESDAY, JUNE 2, 2015

PWEA Lab Practices Committee Meeting  
Contact: Cindy Rock, 570-549-2204

➤ CALENDAR CONTINUED

## CALENDAR OF EVENTS

**WEDNESDAY, JUNE 3, 2015**

Operator Certification Exam  
Lancaster Host – Lancaster, PA  
Visit [www.pwea.org](http://www.pwea.org) to register

**THURSDAY, JUNE 11, 2015**

PWEA Government Affairs Committee Meeting  
Harrisburg, PA  
Contact: Cindy Rock, 570-549-2204

**WEDNESDAY, JUNE 17, 2015**

EPWPCOA Workshop "Energy Efficiency at  
Water and Wastewater Treatment Plants"  
Contact: Marykay Steinman, 610-670-6072

**FRIDAY, JUNE 19, 2015**

CPWQA Awards Meeting and Picnic  
Rich Valley Golf Course – Mechanicsburg, PA  
Contact [info@cpwqa.org](mailto:info@cpwqa.org) for information

**FRIDAY, JUNE 26, 2015**

CPWQA Golf Outing, Picnic and Awards Meeting  
Contact [info@cpwqa.org](mailto:info@cpwqa.org) for information

**FRIDAY, JUNE 26, 2015**

EPWPCOA Mid-Summer Outdoor Event  
Contact: Marykay Steinman, 610-670-6072

**FRIDAY, JULY 17, 2015**

WPWPCA Plant Tour / Meeting  
GE Locomotive – Erie, PA  
Visit [www.wpwqa.org](http://www.wpwqa.org) for information

**THURSDAY, AUGUST 6, 2015**

PWEA Board Meeting  
Contact: Cindy Rock, 570-549-2204

**FRIDAY, AUGUST 7, 2015**

WPWPCA Scholarship Golf Outing  
Glengarry Golf Course – Latrobe, PA  
Visit [www.wpwqa.org](http://www.wpwqa.org) for information

**FRIDAY, AUGUST 7, 2015**

CPWQA Go-With-The-Flow Golf Tournament  
Fairview Golf Course  
Contact [info@cpwqa.org](mailto:info@cpwqa.org) for information

**SUNDAY, AUGUST 9, 2015**

WPWPCA Members at Pirates Game  
PNC Park – Pittsburgh, PA  
Visit [www.wpwqa.org](http://www.wpwqa.org) for information

**TUESDAY, SEPTEMBER 8, 2015**

PWEA Industrial Waste Pretreatment  
Committee Meeting – Harrisburg, PA  
Contact: Cindy Rock, 570-549-2204

**THURSDAY, SEPTEMBER 10, 2015**

PWEA Government Affairs Committee  
Meeting – Harrisburg, PA  
Contact: Cindy Rock, 570-549-2204

**FRIDAY, SEPTEMBER 11, 2015**

Plant Tour, Luncheon and Business Meeting  
Contact [info@cpwqa.org](mailto:info@cpwqa.org) for information

**WEDNESDAY, OCTOBER 28, 2015**

Trade Fair and Expo, The Carlisle Expo Centre  
Contact [info@cpwqa.org](mailto:info@cpwqa.org) for information

GETTING TO KNOW  
BRIAN LUBENOW, EDITOR

**BRIAN LUBENOW**  
**EDITOR**

**"...HE JOINED PWEA/  
WEF IN APRIL 2008  
AND BECAME ACTIVE  
IN THE EDITORIAL  
COMMITTEE  
IN 2010."**

**B**rian grew up in the Reading, PA area and has had an interest in the environmental field since high school. After graduating from Wilkes University with a BS in environmental engineering, he attended the University of Delaware focusing on industrial wastewater treatment. After graduating with an MS in civil engineering, Brian started his consulting engineering career with CDM Smith in Lancaster, PA.

Over the past 12 years with CDM Smith, Brian has had the opportunity to work on a large variety of water reclamation, wastewater conveyance, and hydraulic modeling projects, primarily in Pennsylvania and Maryland. Upon the advice of co-workers, he joined PWEA/WEF in April 2008 and became active in the Editorial Committee in 2010. Involvement in this committee has been a valuable introduction to the variety of great work being carried out by the many PWEA committees. Brian became editor of the KWQM in 2014 and is looking forward to exciting stormwater and collections themed issues in 2015.

Brian lives in Exeter Township, Berks County with his wife and three children. He enjoys trail running and working through the always-long list of home improvement projects in their old farmhouse. 💧

MEET OUR  
NEW MEMBERS

**› ALEXIS ISENBERG**

**HOW DID YOU LEARN ABOUT THE PWEA?**

AI: Through other water quality professionals.

**WHAT WERE YOUR MAIN REASONS FOR JOINING THE PWEA?**

AI: For the networking opportunities.

**WHERE ARE YOU EMPLOYED, HOW LONG HAVE YOU BEEN EMPLOYED THERE, AND WHAT POSITION DO YOU HOLD?**

AI: I have been employed by ADS Environmental for about a year; was previously with Buchart Horn for 14 years.

**WHAT IS YOUR GREATEST SOURCE OF PRIDE OR SATISFACTION IN YOUR JOB?**

AI: Developing relationships with other professionals.

**GENERAL COMMENT:**

AI: I'm looking forward to being educated in the art of wastewater treatment. 💧



# Bylaws Update Notice

**T**he Constitution and Bylaws Committee has been hard at work drafting proposed revisions to PWEA's Constitution and Bylaws. The revisions are fairly extensive and include, among other items, changes to membership categories and indemnification language. These proposed bylaws have been submitted to WEF and are currently under review. We anticipate that the PWEA board will vote on accepting the proposed bylaw revisions at the April board meeting.

At this time, the bylaws would be posted to the PWEA website ([www.pwea.org](http://www.pwea.org)) for member review and comment. You can also email PWEA at [pwea@pwea.org](mailto:pwea@pwea.org) if you wish to receive a PDF of the proposed bylaws.

PWEA's membership is scheduled to vote on adopting the revised bylaws at the Annual Business Meeting at PennTec on June 1, 2015. ♦



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# From the PWEA Stormwater Committee Chair

**T**he PWEA Stormwater Committee is very excited to be an integral part of this stormwater specialty issue of the *Keystone Water Quality Manager*. It is ironic that PWEA's newest committee is the first to help host KWQM's first (at least in a long while) specialty issue. But we hope you find the information within to be of some value to you and your coworkers.

Committee members have contributed some of the articles. **Rhonda Zellhart** of **Cranberry Township** provided us with the cover photo and an article about the township's water outreach program. **Debbie Healey Langley** with **Hazen & Sawyer** has archived our first workshop. And **Nathan Walker** with **AMEC Foster Wheeler** is making a case study for stormwater authorities.

Big brother was our keynote presenter at the workshop, and a big article contributor; **Seth Brown** of **WEF** provides us with WEF's perspective on stormwater. Another presenter at our workshop offers insight into a small urban municipality stormwater management: **Ian McMeans** of **Homestead Borough** has detailed his popular appearance from last September into a KWQM article complete with photos and diagrams.

A Pennsylvanian who has stepped-up to contribute is **Gregory Duncan** with **T&M Associates**, discussing TMDL Implementation Plans. **Dave Slater** with the Harrisburg branch of the **Chesapeake Bay Foundation** offers insights into the economic benefits of the Bay Restoration Plan (we have to clean it up, so we may as well benefit).



**JARED HOCKENBERRY**

Our Stormwater Committee is a collection of practitioners, experts, and folks who just really care about clean water. Our general focus is non-point-source issues, which have not been in the Water Environment Federation's wheelhouse until recently. We are enjoying the pent-up demand, and welcome you to join us. If you would like to learn more about our committee, please contact me at [Jared.Hockenberry@ghd.com](mailto:Jared.Hockenberry@ghd.com) or visit the PWEA website: [www.pwea.org](http://www.pwea.org). ♦

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# PWEA's Stormwater Committee Hosts an Educational Workshop About Stormwater Partnerships & Authorities

BY DEBBIE HEALEY LANGLEY, PE

**P**WEA's Stormwater Committee hosted its first-ever technical workshop focused on *Stormwater Partnerships and Authorities* last fall in New Cumberland. A capacity crowd of over 80 people attended to learn about recent and emerging trends in the field of stormwater management, forming partnerships and authorities in order to accomplish stormwater program goals, solving water quality and quantity issues, and satisfying regulatory requirements.

Many municipalities have been facing difficult challenges of how to pay for stormwater programs that are demanding increasing efforts and resources, such as addressing state and federal regulatory requirements, Municipal Storm Sewer System (MS4) permit compliance, Total Maximum Daily Load (TMDL) reduction goals, nutrient reduction requirements, stream protection, capacity and flooding issues, and infrastructure deterioration. Typically, these projects are funded from General Funds and must compete with more visible and attention-getting public projects, rather than stormwater infrastructure that is "out of sight, out of mind."

Municipal stormwater managers must create a holistic program, and one that incorporates planning, education, policy, finance, and compliance activities within their own municipality, and in some cases collaborating in watershed-based or integrated planning.

For these reasons, PWEA's Stormwater Committee presented this workshop about *Stormwater Partnerships and Authorities* for participants to learn about the benefits of a comprehensive stormwater program; different ways to fund and implement stormwater programs; and communities partnering together for efficiency and to reduce the

cost of stormwater management. The presenters gave excellent presentations that were timely and highly informative. Several exhibitors were also present to show their displays and technical information.

A growing number of municipalities and authorities are enacting stormwater fees, which provides a dedicated funding source to fund stormwater programs. While stormwater utilities/authorities are not new (there are over 1,400 in the United States), they are relatively recent in Pennsylvania. When *Pennsylvania Act 68* took effect in September 2013, it removed doubts. The act enabled stormwater authorities to be formed to establish sustainable, dedicated, and legally defensible funding sources for stormwater management activities. As of this writing, approximately eight municipalities within the state have created stormwater authorities, utilities, or fees. Representatives from two of these municipalities spoke at the workshop to share their experiences.

Charlotte Katzenmoyer of the City of Lancaster gave a detailed presentation about the numerous green infrastructure projects being implemented throughout the city. So far, 159 projects have been implemented that manage 45 million gallons per year of stormwater runoff. She gave recommendations about employing public education early and often, and planning demonstration projects to rally the public about the issues and garner their support of the program. She also said the city's stormwater fee has been implemented with good results, and described the associated credit system that provides an incentive (fee reduction) for property owners who implement site controls.

Steve Norcini of Radnor Township provided information about their recent stormwater fee implementation, and how they emphasized program priorities, a sustainable compliant program, and engaging representatives from various sectors in the community such as commercial, industrial, non-profit, and education.

Also presenting was John Brosious from Pennsylvania Municipal Authorities Association (PMAA), who provided updates of the latest developments about Chesapeake Bay watershed nutrient reduction and credits, and discussed a survey of Pennsylvania municipalities that

**"MANY MUNICIPALITIES HAVE BEEN FACING DIFFICULT CHALLENGES OF HOW TO PAY FOR STORMWATER PROGRAMS THAT ARE DEMANDING INCREASING EFFORTS AND RESOURCES..."**



Speakers at the Stormwater Partnerships & Authorities Workshop presented about emerging trends in the field of stormwater management.



revealed that 57% did not know they can create a stormwater fee. He encouraged technical exchange, such as technical workshops and publications, which will help educate municipal decision makers.

In addition to funding for stormwater programs, the attendees heard how group efforts are making program implementation more efficient. Shannon Rossman of Berks County Planning Commission spoke about how the county has facilitated groups of townships and boroughs to work together as a County MS4 Steering Committee to respond to stormwater regulatory requirements, such as public education programs.

Applications of source reduction were also highlighted at the Workshop. Ian McMeans of Homestead Borough explained how the borough has been proactive with design of a few green infrastructure projects that will reduce wet weather flows in this urban area near Pittsburgh. The borough sees it as a good opportunity for revitalization of a former mill town, and to reduce flows to a regional combined sewer interceptor. The borough has also enacted an ordinance that does not allow any additional runoff with new construction.

Seth Brown of the Water Environment Federation provided an overview of recent initiatives throughout the country. He pointed out that, as a nation, we have made little or no progress on non-point-source pollution in the last 40 years. EPA's estimate is that the percentage impact on receiving waters is the opposite of conditions 40 years ago. That is, 85% of the impact is now due to non-point sources. In addition, there has been a significant increase in nuisance flooding. Some communities have responded by developing non-traditional methods to manage their stormwater programs, such as stormwater fees, innovative stormwater financing, public-private partnerships (such as in Prince George's County, Maryland), to obtain low cost or low interest loans, and hosting low impact design competitions.

Lee McDonnell of PA Department of Environmental Protection provided an update about the MS4 program, TMDL investigations, and inspections. DEP Workshops in 2015 will include topics about TMDL Plans and Chesapeake Bay Pollution Reduction Plans.

**State Senator Edwin Erickson spoke about the benefits of watershed-based approaches.**



State Senator Edwin Erickson of the Pennsylvania 26th District described his support of watershed management and his perspective that watershed-based approaches work best, with collaboration and strategies developed across municipal and county boundaries. He wants to propose stormwater management by counties and integrated planning approaches.

#### **DEBBIE HEALEY LANGLEY, PE**

is an associate with Hazen and Sawyer in Pittsburgh, PA with over 25 years of experience, and is a member of the PWEA Stormwater Committee. ♦

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# WEF Perspectives on Stormwater

BY SETH P. BROWN, PE AND KRISTINA TWIGG

## SHIFTS IN THE SECTOR

It is clear that the clean water sector is currently experiencing a paradigm shift. At the time the *Clean Water Act* was written, traditional point sources, such as industrial and wastewater effluent, were the leading cause of water pollution. This was most evident from the infamous Cuyahoga River fire of 1969, which helped galvanize the public's support for stricter environmental regulations. In 1970, 85% of water quality impairments were associated with traditional point source pollution, with the remaining balance coming from nontraditional sources, primarily agricultural and urban stormwater runoff – remember that urban stormwater was not regulated in 1972.

While the overall amount of pollution in U.S. waters has been greatly reduced – a testament to the success of the *Clean Water Act* – the distribution of sources has done a 180, with nonpoint sources now being the largest contributors to water pollution in many cases.

William Ruckleshaus, EPA's first administrator, pointed out in a 2010 *Wall Street Journal* opinion piece that stormwater runoff, both agricultural and urban, is now the water quality issue of the day. Since agriculture is currently unregulated, outside of concentrated animal feeding operations, the target is now squarely on the back of those regulated stormwater entities and communities.

Problems associated with urban stormwater runoff vary and include flooding, ecological impacts to receiving waters, degradation of headwater streams, and combined sewer overflows. A 2013 National Oceanic and Atmospheric Administration (NOAA) report reveals that the incidence of "nuisance flooding" has greatly increased in coastal areas over a similar timeframe, with the highest rates in the Mid-Atlantic where cities like Baltimore and Annapolis are experiencing increases of 300% to 900%.

Coastal waters also are experiencing significant ecological damage due to the hundreds of dead zones driven by an overloading of sediment and nutrients and a resulting depletion of oxygen. The hypoxic zone in the Chesapeake Bay, for instance, has grown to one cubic mile at its maximum. The Gulf of Mexico experiences a dead zone roughly the size of Connecticut – a size that is 2.5 times the predicted rate even though billions of dollars have been spent on efforts to address this problem. While coastal areas are being severely affected, small headwater streams in urban areas are receiving the brunt of under-managed urban stormwater runoff. A 2012 EPA report on the status of streams in the U.S. reflects these impacts, as the report shows that over half (55%) of all streams in the U.S. do not support healthy populations of aquatic biota.

Lastly, a 2004 EPA report on the status of water quality found that over 850 billion gallons of untreated or under-treated sewage is released from combined sewer systems to urban waters annually.

## DRIVERS IN THE SECTOR

### Urbanization

The driver behind all of stormwater runoff impacts is urbanization, which disrupts the hydrologic cycle by drastically increasing the volume and rate of overland runoff. Specifically, it is the introduction of impervious surfaces associated with urbanization that reduces infiltration to groundwater sources, both shallow and deep. The effects of stormwater runoff depend on a variety of factors, such as the intensity and age of development, the level of connected impervious flow paths, and surrounding land uses, among other factors. Land development, which drives urbanization, comes in two distinct forms; new development and redevelopment.

New development most often occurs in the suburban and exurban landscape, as well as in areas with growing populations. According to a USGS study, the corridor between Atlanta and Charlotte is projected to experience an increase in urbanization of 190% over the next 30 years leading to a megapolis corridor similar to the Northeast urban corridor between Washington, D.C.



and Boston. In contrast, ultra-urban environments, such as major cities, experience more redevelopment than new development. However, the dynamics related to urbanization may be shifting.

A 2011 Brookings Institution study of the 100 largest metropolitan areas in the U.S. showed that population growth (and therefore urbanization) in suburban/exurban areas outpaced infill/redevelopment rates between 2000 and 2010. However, a flip occurred after 2010. This may be due in part to the after-effects of the 2008 housing crises, but also may reflect the emerging revitalization of urban core areas.

Regardless of these relative rates, most of the roughly 100 million acres of developed land in the U.S. was constructed prior to the regulation of stormwater runoff. Considering this fact and that EPA projects a future land development rate of 800,000-1 million acres per year for the next 30 years in the U.S., it is clear that existing surfaces will continue significantly affect waterbodies unless retrofits address these ongoing impacts. Add in the dynamics of climate change, which is projected to cause episodic wet/dry periods as well as an increase in the intensity of storm events, it is evident that these the effects of stormwater runoff will only get worse if left unaddressed.

### Policy

Due to the growing awareness and recognition of the negative impacts of stormwater runoff, regulations are becoming increasingly stringent across the country. The most singular example of this is EPA's effort to update the national stormwater MS4 program. This rulemaking included several proposed elements, but the most significant was the first-ever national performance standard for stormwater based on a retention standard. Most likely, the standard would have been expressed as a percentile storm capture. This approach respects climatic variability across the country, for instance the 80th percentile storm in Yuma, Arizona will be much smaller than in Fairfax, Virginia. However, it does not account for the variability in soils and site conditions, which are significant factors related to urban stormwater runoff generation. The national stormwater rulemaking was officially deferred by EPA in March 2014. However, EPA has since stated their intention to "strengthen the existing program" and consistently cites the high rate of expired permits in both the Phase I (25%) and Phase II

## "MANY MUNICIPALITIES HAVE BEEN FACING DIFFICULT CHALLENGES OF HOW TO PAY FOR STORMWATER PROGRAMS THAT ARE DEMANDING INCREASING EFFORTS AND RESOURCES..."

(50%) programs as a justification for this need. EPA has also looked to new MS4 permits as examples, such as those in Washington, D.C. and Montgomery County, Maryland that are retention-based, include prescriptive actions, and establish retrofit targets for existing impervious acreage.

Currently, 18 states and the District of Columbia have a retention-based standard, but the application of this type of standard is not without controversy. The use of flow as a surrogate for other pollutants in a TMDL is one example. EPA Region 3 attempted to use this approach for an existing sediment TMDL in the Accotink Creek watershed of Fairfax, Virginia. EPA, however, lost a court case brought by Fairfax County and the Virginia Department of Transportation where the judge stated, "flow is not a pollutant, and therefore cannot be limited." The Buckley Air Force

Base, in Colorado Springs, Colorado, filed a petition against their Phase II permit, which requires retention to meet pre-development conditions and cited Accotink Creek as a precedent. The petition was thrown out, but challenges to retention standards in the sector continue. The recent release of a memo by EPA and the Office of Management and Budget focusing on stormwater runoff in the context of TMDLs reflected a removal of language related to the use of surrogates; however, this omission does not necessarily mean that this approach may not be revisited by the regulatory community in the future. Lastly, environmental groups continue to push for more aggressive stormwater management in the courts with an example being the lawsuit filed on December 19, 2014 by National Resources Defense Council (NRDC) and Environmental Defense Center (EDC)



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against EPA to strengthen the Phase II MS4 program. It is likely these dynamics will continue to play out across the country in the coming years.

## Green Infrastructure and Low Impact Development

While the negative impacts associated with urban stormwater runoff are significant and growing, the sector now has a chance to not only address these impacts but also revitalize urban and suburban environments. Solutions such as bioretention, permeable pavements, green roofs, and rainwater harvesting systems have many benefits beyond improving water quality. While these retention-based practices are not universally used; implementation of these green infrastructure (GI) solutions is on the rise. There are many drivers behind a shift in the sector from simply "trap and treat" to "retain on-site." One of the most significant is the use of GI to aid in addressing combined sewer overflows (CSOs). Support from EPA on the use of GI for wet weather management, documented through memorandums released by the Office of Water as well as the Office of Enforcement and Compliance, has been key in pushing forward the integration of GI into consent decrees. This approach, referred to as integrated management, allows communities and utilities to shift some of their clean water investments from traditional infrastructure to GI practices. In many instances, the use of GI is more cost-effective than traditional infrastructure. However, it is the additional co-benefits, such as improved air quality and reduced heat island effects as well as the generation of low-entry green jobs that are so compelling. Stormwater infrastructure that attempts to mimic natural hydrologic conditions in suburban and exurban areas is often referred to as "low impact development" (LID). It has been employed since the 1990s. However, recent regulatory shifts in the MS4 program to retention-based practices has provided a boost to LID. As with urban-focused GI approaches, there is good reason to believe that LID will continue to mature as a stormwater management approach.

## Funding and Financing

As previously discussed, there are differing types of urbanization, thus there are multiple types of approaches and costs associated with management of stormwater runoff. Integrating

stormwater management during new greenfield development is relatively less expensive while stormwater management infrastructure investments made during redevelopment tend to be costlier due to increased site constraints, such as space/right-of-way and existing utilities. Lastly, full-scale retrofitting of existing impervious surfaces is often the most expensive option, as this approach has similar constraints as redevelopment and often is done for the sole purpose of reducing/treating stormwater runoff rather than being a portion of larger redevelopment project. Costs for urban retrofits can range from \$100,000 to \$250,000 per impervious acre treated depending upon site conditions, climate, and practices applied. Ongoing maintenance is also needed in order to ensure that these facilities provide adequate treatment capacity over the duration of the design life. These costs are often described in terms of a percentage of capital cost and can range widely, however, most often this range is between two and 10% of upfront construction investment.

**"WITH LIMITED PUBLIC FUNDING COUPLED WITH A RISING NEED FOR INVESTMENT, SOME COMMUNITIES HAVE LOOKED TO INNOVATIVE FUNDING/FINANCING ALTERNATIVES TO ADDRESS NEEDED INVESTMENTS."**

The maturation of a sector is often tied to financial investments. A clear water sector example is the major improvements in wastewater effluent as a result of the national secondary treatment standard. To help the sector meet this standard, the federal government invested billions of dollars. This investment took the form of the Construction Grants program, which constituted half of all public investments and one-third of total investments in the wastewater sector between the mid-1970s and the late 1980s when this grant program evolved into the Clean Water State Revolving Fund (SRF). The results of these investments between 1972 and 1978 alone are telling. The number of treatment plants discharging raw wastewater was reduced from 16% to 0.6% and was completely eliminated by 1996. There was a six-fold increase in tertiary treatment as well. A similar effort

is needed in the stormwater sector. However, the days of large Federal investments in water infrastructure are likely over. Additionally, while many SRF programs allow for the funding of stormwater and GI investments, less than 4% of SRF dollars have been spent on anything other than traditional wastewater infrastructure. To be fair, many SRF programs are evolving to better accommodate stormwater and GI investments, but it is clear that SRF dollars will likely not be a panacea for addressing stormwater runoff, at least in the near term.

Currently, there are approximately 1,400 stormwater utilities in existence across the country, leaving the other 7,100 or so MS4s to rely on general funds, taxes, municipal bonds, grants or Federal monies to address the cost for investment in stormwater infrastructure. The most common form of funding for stormwater comes through general funds. Considering that general funds are not dedicated revenue streams and that public dollars at the local level have become limited after the 2008 economic crash, this avenue for funding is not likely to adequately address the growing needs of the stormwater sector. The formation of stormwater utilities increased dramatically after the promulgation of the Phase II MS4 regulations, however legal challenges and a lack of political will to increase fees, or perceived taxes, on the public for a problem that the typical layperson would understandably not fully grasp may limit this exponential growth. To be sure, stormwater utilities will continue to be formed in the future, and a majority of legal cases break towards the support of stormwater utilities, but these entities may address the growing funding gap in this sector.

With limited public funding at the Federal, state, and local levels coupled with a rising need for investment in stormwater/GI, some communities have looked to innovative funding/financing alternatives to address needed investments. Three examples, Philadelphia, Washington, D.C., and Prince George's County, Maryland, illustrate the diversity of innovative funding/financing approaches communities can consider as they plan for future investments in stormwater/green infrastructure. Philadelphia has created a grant program that rewards project teams who can deliver urban retrofit projects below \$100,000 per impervious acre.

## WEF SHIFTS

WEF recognizes the increasing significance of stormwater management and is making changes to provide the sector with the information and tools necessary to address this growing issue. In 2014, WEF saw continued growth of its stormwater program. At the end of September, WEF hosted its second successful Stormwater Congress, collocated with WEF's annual conference, WEFTEC. It included more than 30 stormwater technical sessions and workshops, a sold-out luncheon, two receptions, as well as the Stormwater Pavilion, a concentrated area for exhibiting stormwater companies. This was the third year for the Stormwater Pavilion, and with more than 30 exhibitors spanning 4,000 square feet, its size was double last year's pavilion. At the Stormwater Congress, WEF also hosted the first National Stormwater Summit to bring together municipal stormwater leaders and other sector professionals. Meeting participants discussed the stormwater sector's technical support and advocacy needs and how those needs can be addressed at the national level. Consensus was that WEF should take a national role in the sector and convene future meetings.

In addition to its annual conference, WEF also provided education and training on stormwater throughout the year through avenues such as its monthly e-newsletter, *The Stormwater Report*; its quarterly magazine, *World Water: Stormwater Management*; and its webcast program, which included information on innovative financing, STEPP, Waters of the U.S., Stormwater Control performance, and more. Further, in August, WEF released two books related to stormwater. The first, *Green Infrastructure Implementation* provides actionable information promoting the implementation

of green infrastructure. The second book, *Wet Weather Design and Operation in Water Resource Recovery Facilities*, provides water professionals with a comprehensive reference of current design and operational practices for managing the unique challenges associated with wet weather flows.

Also in 2014, 25 expert judges rated more than 100 videos submitted to the StormTV Project, a stormwater video competition. Through the 2012, 2013 and 2014 competitions, WEF has collected more than 220 videos highlighting green infrastructure, manufactured treatment devices, stream restoration, public education and more. Finally, in 2014 WEF also received a \$25,000 grant from EPA to develop a national municipal MS4 stormwater and green infrastructure recognition program.

## WEF Focus on Innovation in Stormwater Sector

A dynamic field requires innovative solutions, and that is a growing hallmark of WEF's approach in the stormwater sector. One example is the promotion of LID and GI design competitions. The first such event was hosted in the Houston area from 2009-2010, and has changed the conversation on stormwater management in that city. Based upon this success, similar competitions have been held in Tulsa, Philadelphia, Washington, D.C., Memphis, San Antonio, and Chattanooga – just to name a few. WEF hosted a workshop with many of these groups, and developed a report for those interested in hosting their own competition, go to [www.wef.org/lidcompetition](http://www.wef.org/lidcompetition) for more information.

Another example of promoting innovation in the stormwater sector is the Stormwater Testing and Evaluation for

Products and Practices (STEPP) initiative that WEF started in 2012. This program seeks to establish a national testing and evaluation program for proprietary stormwater products as well as public domain practices in order to address the current piecemeal approach of testing and evaluation programs at the state and local level. This existing framework inhibits innovation in the sector through market entry barriers for emerging technologies. WEF committed to exploring this concept in 2013 after establishing a workgroup and associated steering committee. The latter body led the effort to author a white paper providing background information on existing and potential analogue programs and outlining challenges resulting from the lack of a national program. Results listed in the white paper, released in February 2014, were that a national program is not only feasible, but it is needed. WEF hosted a webcast in March 2014 focusing on the STEPP white paper that attracted over 750 registrants, which further illustrates the strong interest in the sector for a national testing and evaluation program.

Lastly, WEF has supported the issue of funding and financing of stormwater/GI through partnerships with EPA on webcasts as well as providing WEFTEC programming and products, such as articles and feature stories. Continued focus is expected to occur in this sector as the need for innovative stormwater funding/financing also grows.

## SETH P. BROWN, PE

Stormwater Program and Policy Director  
Executive Editor, *World Water: Stormwater Management*

## KRISTINA TWIGG

Associated Editor for *World Water: Stormwater Management* ♦



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# Customer Service: Our Best Watershed Stewardship Tool

## What We Teach Everyone Today will Help Protect Our Water Tomorrow

BY RHONDA ZELLHART, CRANBERRY TOWNSHIP

**W**ater is, without a doubt, our most precious resource. Throughout history, civilizations have been built around it, landscapes have been shaped by it, and people have died protecting it. Water was on the earth before humankind, so why is its availability an issue? Even with today's advancements in knowledge and technology, millions of people suffer by not having access to clean water.

First, the amount of water on earth is finite, and less than one percent of it is "available" water for human consumption. We must exercise care and caution as we consume and use this resource. To this end, many worldwide initiatives over the last 50 years have focused on drinking water and wastewater. We want it potable before we drink it; and after we flush it, we want it stream pristine. No one likes to catch toilet paper when they are fishing.

The environmental efforts of the '70s and '80s are commendable, but have these efforts kept pace with the ever-expanding human population and the pollution that goes with us? What about the ramifications of urbanization on stormwater? Also, has our society trended away from the simple conservation efforts that led to such unforgettable catchphrases as "if it's yellow let it mellow"?

Let's leave the catchy '70s slogans off to the side and assume that even with our best efforts as population and urban densities have grown, so has our potential to pollute water. It is just a simple fact. We have interrupted the natural filtration process of the water cycle. Whether it be an increase in the amount of pollutants, or a decrease in permeable area, we have altered what was once perfect. Can we get the natural water cycle back to perfect?

Certainly there are options that may get us close to perfect, but they would be cost prohibitive. So how do we locate the nexus for clean water and affordability? We must all realize the importance of water quality and that for any program to succeed, each person must understand their role as a water steward. Even in areas where we are blessed with abundant



amounts of water, nothing should be taken for granted. Storms will still carry sedimentation and litter downstream. Even if our basins don't clog, eventually the debris will build up. For most of us in the water and wastewater industry, these ideas are long formed in our DNA. CSOs, SSOs, and basement backups have left many of us with images of what happens when there is a lack of stewardship.

So how do we translate this message to our customers and the general public? We share our passion. We share our stories. We explain that each and every person is a water steward and every positive action that they take has a positive impact on our watershed.

**RHONDA ZELLHART** has been a wastewater professional for over 15 years and is currently the Industrial Pretreatment Coordinator for Cranberry Township, photographer for WPWPCA and PennTec, and PWEA Industrial Pretreatment & Stormwater Committee member. Mrs. Zellhart credits Cranberry Township's Servant Leadership as her professional inspiration. 💧

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# Making the Case for Stormwater Authorities to Pennsylvania Residents

BY ERIC ECKL, WATER WORDS THAT WORK  
AND NATHAN WALKER, AICP, AMEC FOSTER WHEELER

*"I WOULD SUPPORT THE CHARGE TO PROMOTE A CONTINUED STANDARD OF LIVING, FREE OF THE CONSTANT WORRY OF STORM DAMAGE. ALSO TO ENSURE WHAT WE HAVE LEFT TODAY IS THERE FOR MY OWN CHILDREN."*

*"I DON'T OPPOSE WHAT YOU ARE TRYING TO DO. I OPPOSE IT COMING OUT OF MY POCKET."*

These two quotes are from Pennsylvania residents who were asked if they would support the idea of a stormwater authority in their community. These statements illustrate how water pollution and flooding issues are the proverbial Catch-22 for local officials. If homes or streets flood, or if the local stream turns to a muddy, oily flow, residents organize at the next municipal meeting to ask why local leaders are not doing more. But when officials study these very same problems and offer ways to pay for them, other residents state their displeasure about wanton spending and the prospect of higher taxes. So what's a well-meaning public servant to do – provide greater services or keep the cost of local government low?

If presented correctly, Pennsylvania's new law allowing for stormwater authorities may offer a solution. Recognizing that municipalities needed more flexibility to cost-efficiently coordinate flooding and water quality decisions and to pay for

long-term management of stormwater infrastructure, the Pennsylvania Legislature passed Act 68 in July 2013. This law authorizes local governments to create stormwater authorities or add stormwater responsibilities to any existing authority that serves residents and business owners.

Municipal authorities are commonplace in the Commonwealth. About half of Pennsylvanians enjoy the services of at least one authority, which provide drinking water, sewage treatment, waste management, recreational, and community services. And now, local governments have the option to add stormwater to that list.

There are at least six reasons a stormwater authority might be right for your community:

1. **Sustainable funding.** Funding for stormwater traditionally goes up and down based on flood events or other emergencies. This is an inefficient way to plan and implement a program. This approach can also put a community at risk for non-compliance

with state and federal requirements. An authority provides stability and can be used to match available grant opportunities.

2. **Preventive maintenance.** It is often easy to defer maintenance on stormwater infrastructure because it is out-of-sight-out-of-mind. This deferred maintenance strategy can help balance a budget in the short-term, but will cost the municipality more in the long-term. Revenue from a utility can ultimately save money by investing in preventive maintenance.
3. **Flexible choices.** Fees assessed by a stormwater authority can be set up in several ways to address a community's unique needs and goals.
4. **Green infrastructure.** Green infrastructure provides communities multiple benefits ranging from stormwater management to community development and urban greening. Stormwater funds can be invested in landscape

plans, rain gardens, tree planting, wetland construction, and stream improvements to help achieve multiple community goals.

5. **Focused effort.** Each of a municipality's responsibilities competes for staff and financial resources. Authorities can concentrate activities and funding exclusively on stormwater management, rather than dividing resources on all the other responsibilities seeking the scarce municipal dollar.
6. **Regulatory compliance.** Many localities are subject to strict state and federal water quality permits that require investment in new stormwater projects. A stormwater authority can provide an organizational structure that promotes compliance with these mandates to avoid fines or sanctions.

So if these are the benefits, why wouldn't a local government establish a stormwater authority? To gain a comprehensive understanding of the obstacles elected officials face when considering a stormwater authority, the Foundation for Pennsylvania Watersheds engaged Water Words That Work, LLC to explore the best ways for a local

government to broach the subject of a stormwater authority. This included a survey conducted between June and October 2014.

The Foundation convened a steering committee to oversee the firm's work. The committee included representatives from the Pennsylvania Municipal Authorities Association (PMAA), Pennsylvania State Association Boroughs (PSAB), Pennsylvania State Association of Township Supervisors (PSATS), AMEC Foster Wheeler, and Brian Auman Landscape Architects. The National Fish and Wildlife Foundation's (NFWF) Chesapeake Bay Stewardship Fund supported the effort.

Water Words That Work conducted three separate research projects to explore the issue from different angles:

- A literature review of case studies, market research, feasibility studies, and academic papers that touched on the introduction of dedicated stormwater fees.
- An online survey of authority, township, city, and borough officials.
- An online panel survey of Pennsylvanians in 30 counties.

According to the survey of local government officials, the number one obstacle to enacting a stormwater authority is fear of "backlash from residents." And the reason for this anticipated backlash is simple: stormwater authorities are typically supported by a new, dedicated fee that is applied to all property owners.

Despite this finding, the research revealed that, by a slight margin, Pennsylvanians are more likely to approve than disapprove of a stormwater authority approach. The results of the survey allowed researchers to identify five steps that a local government can take to successfully present a case for a stormwater authority:

- **What the fee is called matters.** The name should emphasize the benefits (for example, Pollution Control and Flood Reduction Fee) rather than describe the problem.
- **Clearly show ratepayers how the money will be invested.** Most importantly, use "before and after" photos that explicitly show residents how their dollars will be used.
- **Present the fee as a solution to local problems and providing local benefits;** not as a measure to meet regulatory requirements.
- **Present the fee in its smallest increment:** dollars per household per month rather than a long-term target (e.g., \$3 million over five years).
- **Affirm to ratepayers that the money will be used for its stated purposes;** and that the funds will not be "raided" for other priorities.

If your local government is giving any thought at all to adopting a stormwater authority, the NFWF grant provided funding for an informative website with steps you can take to avoid the Catch-22! [stormwater.pennsylvaniawatersheds.org](http://stormwater.pennsylvaniawatersheds.org)

On this site, you will find copies of all the research studies, as well as a collection of customizable outreach product templates:

- Sample FAQs for you to customize and present to ratepayers.
- A collection of photos to illustrate stormwater problems and solutions.
- A collection of "before and after" illustrations.
- A customizable PowerPoint presentation that you can use to brief community groups and civic organizations.

Stormwater authorities present communities with a flexible opportunity to become cleaner, greener, and safer. And the research and outreach materials available on this website can help you make that clear to your residents. ♦



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**“THE MOST IMPORTANT FACTOR IN DEVELOPING A MUNICIPAL STORMWATER PLAN – EVEN IN A SMALL URBAN MUNICIPALITY – IS A CHANGE IN MINDSET FROM VIEWING BLIGHTED AND ABANDONED PROPERTIES AS LIABILITIES TO SEEING THEM AS POTENTIAL ASSETS.”**

# Stormwater Management in Small Urban Municipalities

BY IAN MCMEANS, BOROUGH MANAGER,  
HOMESTEAD BOROUGH

**T**he Borough of Homestead is a 0.6-square mile urban municipality on the southern side of the Monongahela River. Just seven miles from downtown Pittsburgh, Homestead has a rich history, ranging from the Homestead Grays Baseball Team to the strikes at the Homestead Works Steel Mill. At its peak, Homestead had nearly 20,000 residents, a number that has significantly declined in the decades since the closure of the Homestead Works mill. In the 2010 Census, Homestead had 3,165 residents living in 1,895 housing units. Following the significant population decline, over 20% of the housing units in the Borough were vacant as of the 2010 Census, as well as 280 vacant parcels which account for 30.76% of the Borough’s 117-acre residential area. These vacant parcels, while mostly scattered throughout the Borough, should be seen as an opportunity for public and private investment rather than a hindrance to development.



## AVAILABLE LAND FOR GREEN INFRASTRUCTURE



Given Homestead's history as a working class town built around a large manufacturer, most of the lots in town are small in size, averaging about 25 feet by 100 feet. The small lot size presents a hindrance to the construction of new residential units on individual vacant parcels. Due to their size, there are a limited number of productive uses for these lots:

- **Side yards for neighboring properties** – Allegheny County offers a Vacant Property Recovery Program that provides a path for neighbors to acquire clear titles to vacant lots for purposes of creating side yards.
- **Community Gardens** – Some residents have planted gardens on the vacant lots next to their homes.
- **Stormwater Infrastructure** – Like many river towns, Homestead is arrayed on a hillside, providing a natural means for stormwater to flow. Investment in vacant corner lots can capture stormwater runoff in bioswales and rain gardens. Two homes with a vacant lot in between could disconnect their downspouts from sending water to the street and channel the water into stormwater retention systems in the lot between their properties.

In addition to the vacant parcels throughout the borough, the municipality owns a one-acre park and four playgrounds where stormwater management techniques could be incorporated. In the business district, there are seven municipal parking lots that also represent opportunities for investment in stormwater management. Due to the geographic layout of the community, there is a significant need to address stormwater to prevent flooding in the lower areas of town and

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to eliminate overflows into the Monongahela River. Most of Homestead's sewer system was built in the early 1900s and is a combined sewer system. Homestead is part of the ALCOSAN sanitary sewer system which covers 83 municipalities in Southwestern Pennsylvania and is subject to the EPA Consent Decree to eliminate combined sewer overflows into the river. Since most of the borough is a combined sewer system, the best way to comply with the Consent Decree on a local level is to prevent stormwater from entering the sewer system through investments in green infrastructure and source reduction.

The Western Pennsylvania Conservancy recently conducted a Green Scan in Homestead, producing an analysis of the current green assets in the Borough and opportunities for investment. One of the pieces of the analysis was a survey of the current street trees in the borough. Currently, the Avenues Business District features nearly 100 street trees on Seventh Avenue and Eighth Avenue. However, the residential areas of the borough are lacking in street trees. A certified forester was brought in by the Conservancy to analyze the potential for additional street trees and he identified over 200 locations where street trees could be added to the borough.

While stormwater management is largely a public concern, the Borough has seen positive investments in stormwater infrastructure from private developers as well. In 2012 Homestead passed an Ordinance requiring all new development to conduct pre-development stormwater surveys and design new construction so that no additional stormwater was added to the collection system. The first instance of this ordinance's enforcement came in 2013 when a Bottom Dollar Grocery Store was built on previously blighted property. Before development, the property had multiple structures that were blighted, abandoned, and tax delinquent. When informed of the borough's Stormwater Ordinance, the private developers indicated this was not a barrier to development and was a requirement in many other states where they worked. During development, large stormwater retention tanks were installed under the parking lot, which has reduced the borough's output of water by about 3 million gallons per year. Further private development along the Amity Street Corridor, a key connector between the residential neighborhoods, the Avenues Business District and the Waterfront Shopping

## ALCOSAN WET WEATHER PLAN



**“WHILE GEOGRAPHICALLY SMALL, HOMESTEAD SITS AT A KEY POINT IN THE PLAN AS THE FIRST POINT OF CONNECTION TO THE MONONGAHELA RIVER TUNNEL. THE BOROUGH HAS TAKEN THE INITIATIVE TO RESEARCH AND DEVELOP SOURCE REDUCTION TECHNIQUES THAT COULD ELIMINATE THE POTENTIAL OVERFLOWS FROM HOMESTEAD, WHICH AVERAGE AROUND 55 MILLION GALLONS PER YEAR.”**

Center has complied with the borough's Stormwater Ordinance and invested in source reduction technologies.

Stormwater management is an important part of the future of Homestead Borough because of our location in the ALCOSAN sanitary sewer system. In order to comply with the EPA Consent Decree on a system-wide level, ALCOSAN has created a Wet Weather Plan. The primary solution of the Wet Weather Plan is to build tunnels under each of Pittsburgh's three rivers to capture combined sewage overflows and carry them to the ALCOSAN treatment facility. In total, this plan is estimated to cost over \$85 billion. While geographically small, Homestead sits at a key point in the plan as the first point of connection to the Monongahela River tunnel. The borough has taken the initiative to research and develop source reduction techniques that could eliminate the potential overflows from Homestead, which average around 55 million gallons per year. If these overflows could be significantly reduced or eliminated, ALCOSAN would see dramatic cost savings from not having to build the Monongahela River Tunnel all the way to Homestead.

The Borough of Homestead's situation is not unique – it has a similar story to other steel towns in the greater Pittsburgh area. What is unique is the aggressiveness with which local leaders have been proactive in addressing stormwater management in the community. The most important factor in developing a municipal stormwater plan – even in a small urban municipality – is a change in mindset from viewing blighted and abandoned properties as liabilities to seeing them as potential assets. Blighted houses can be demolished to make room for bioswales and rain gardens and current vacant lots, no matter how small, and can have their potential maximized to capture stormwater. Sidewalk tree pits can be built to mitigate water running down the street before it enters a catch basin and public assets such as parks, playgrounds and parking lots can be refurbished to maximize retention of stormwater. While Homestead's initiatives alone will not make ALCOSAN's Wet Weather plan obsolete, similar investments in green infrastructure and source reduction throughout the 83 municipalities that feed into the ALCOSAN system would result in significant cost savings. ♦



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# Planning for TMDLs:

## A Look at What's Ahead for MS4/TMDL Watershed Communities in Pennsylvania

BY GREGORY S. DUNCAN, PE, LEED-AP, WATER RESOURCES ENGINEER, T&M ASSOCIATES  
AND SEAN M. FURJANIC, PE, ENVIRONMENTAL PROGRAM MANAGER, PADEP

**F**or scores of Pennsylvania communities with municipal separate storm sewer systems (MS4s) discharging stormwater to surface waters with an approved Total Maximum Daily Load (TMDL), this year will be pivotal for municipal planning and budgeting for the next decade and beyond.

A TMDL defines the total amount of a pollutant a water body can receive from both point and nonpoint sources while still meeting water quality standards. Waste load allocations (WLAs) in TMDLs prescribe the loads allocated to existing and future point sources to meet a water body's designated uses.

Many MS4 communities have been assigned WLA(s) in TMDLs. A community's WLA may be different and depends on a number of factors: hydrological, meteorological, land area, land use types and development density to name a few. MS4s with assigned WLA(s) are required by NPDES permits to undertake pollutant reduction activities to meet state water quality standards.

The General NPDES Permit for MS4s ("PAG-13") and individual MS4 NPDES permits require the development of a TMDL Plan where MS4 discharges to TMDL waterways are assigned WLA(s). The TMDL Plan has two components – a TMDL Strategy that must be submitted to PADEP as part of the Notice of Intent (NOI) or individual permit application, and TMDL Design Details, which must be submitted to PADEP no later than one year following permit coverage. Some MS4s have been issued permit coverage and are now on the clock to prepare the TMDL Design Details, which has an objective to describe in detail the actions an MS4 will take to meet the WLA(s) in a given TMDL. Presently, many other MS4s have not been issued coverage and are awaiting feedback on TMDL Strategies that were submitted.

### TMDL Reports

Many TMDLs have been established through what is referred to as a "reference watershed method" study. This comparative analysis served as a means of determining the degree of water quality impairment and defines the allowable loading for a water body. The water body's pollutant load capacity is divided between nonpoint sources and point sources – including MS4 communities.

Each MS4 community within the watershed is required to take steps towards reducing pollutants in order to meet its share of WLA(s). Steps could include restoration activities, such as streambank repair and reestablishment of wooded buffers along watercourses, as well as programmatic changes and application of technological advances within the municipality and respective authorities that serves it.

### TMDL Plan Development

The purpose of this article is to share some insight on the planning and direction taken by one of the first communities to receive PAG-13 General Permit coverage approval under the new General Permit. With this approval, this community was required to develop the TMDL Design Details component of the TMDL Plan by 2014, and the work represented one of the first efforts of its kind in Pennsylvania. Much of the advisory information presented here was borne out of that work, which involved significant levels of input from PADEP, and should provide many with useful insight with respect to the development of TMDL Plans.

The community was required, like many other Pennsylvania communities, to prepare a TMDL Strategy as part of its NOI for the PAG-13 General Permit. Towards this end, the community's

**"THOUGH NOT EXHAUSTIVE, THIS ARTICLE DISCUSSES AN EXTENSIVE CULMINATION OF PROGRAM EFFORT PUT FORTH BY ENGINEERS, SCIENTISTS, MODELERS, ATTORNEYS, AND COMMUNITY OFFICIALS WHOSE PROGRESS WAS GUIDED ITERATIVELY BY PADEP AND WATERSHED ADVOCACY GROUPS IN DEVELOPMENT OF A TMDL PLAN."**





(Photo Credit: Perkiomen Watershed Conservancy – Stormwater Basin Retrofit)

**“...THE MOST SCIENTIFICALLY AND PROCEDURALLY DEFENSIBLE COURSE OF ACTION IN ASSESSING WASTELOAD REDUCTIONS BY RESTORATION ACTIVITIES WOULD BE TO ANALYZE THE THEORETICAL BENEFIT OF THESE DESIGNS WITHIN THE SAME TOOL THAT WAS USED TO CALCULATE THE TOTAL BASELINE POLLUTANT LOADS.”**

consulting engineer analyzed a range of restorative projects and programs that would be quantified through surface water quality modeling to verify that its pollutant reduction requirements under the TMDL would be achieved.

Subsequently, DEP approved coverage under the PAG-13 General Permit in 2013. Over the next year, the community worked closely with PADEP to prepare an integrated TMDL Plan (i.e., an updated TMDL Strategy with TMDL Design Details). While this effort continues to be in process (and will continue to be as other partnerships and additional restoration goals are formulated), there is value in describing the steps taken in concert with PADEP so that others may, in combination with PADEP training and guidance and other outreach efforts, craft their own TMDL Plans.

Though not exhaustive, this article discusses an extensive culmination of program effort put forth by engineers, scientists, modelers, attorneys, and community officials whose progress was guided iteratively by PADEP and watershed advocacy groups in development of a TMDL Plan.

## **KEYS TO DEVELOPING A TMDL PLAN**

### **1. Determine which modeling tools will best substantiate your efforts**

One key goal in the initial/qualitative planning was to establish an analysis framework that would be cost-effective, yet scientifically and procedurally defensible for demonstrating compliance with pollutant reduction requirements. In developing the approach, this community wanted to be in compliance with its share of the WLAs, but also wanted to be appropriately credited for the effort and expenditures made towards this goal.

Based on past experience with surface water models, it was thought best to have agreement between the data used to generate WLAs in the TMDL and the modeling that would ultimately be used to quantify the community's wasteload reduction credits garnered through future restorative practices. Consequently, it was important to demonstrate meeting these reductions with the same model used to generate the initial data for the TMDL.

In Pennsylvania, many TMDLs were developed using the ArcView Generalized Watershed Loading Function (AVGWLF) model. Unfortunately, the AVGWLF model is no longer available. In addition, there was little documentation of the modeling approach used in the original TMDL report to verify if the original model was being used properly.

In discussions with PADEP, it was determined the new version of AVGWLF, called *MapShed*, would be used. However, this meant the WLAs in the TMDL would need to be recalculated.

Based on improvements to both data and model algorithms made since the earlier version of AVGWLF used for TMDL assessments, there was a consensus with PADEP that a more accurate depiction of the TMDL (and consequently WLAs) could be determined by modeling with the latest version of the original model used to calculate most of the TMDLs in Pennsylvania.

Initially, it seemed a lot of work might be required for the new modeling, but the benefit of using this modeling environment was quickly realized. Various restoration scenarios, and their pollutant reduction potential, could be analyzed to produce WLAs with exactly the same initial assumptions and land use input data in the analysis of pre-restoration verses post-restoration scenarios.

### **2. “To parse or not to parse”**

Early on, it is important to determine how much of the TMDL-assigned WLA is actually the responsibility of the municipal permittee. A TMDL may have assigned the WLA to the entire municipality; however, not all stormwater within the municipality may flow into the MS4 system. It is possible to “parse” out the MS4 permittee's actual WLA responsibility under the NPDES permit as part of TMDL Plan development. There are simple and complex approaches to parsing, ranging from the use of land use ratios to full-blown modeling exercises. PADEP plans to post guidance on parsing on its website in 2015 ([www.depweb.state.pa.us/MS4](http://www.depweb.state.pa.us/MS4)). Parsing may prove beneficial to many MS4 permittees.

### **3. Project pre-assessments: cost vs. benefit**

Many options exist for MS4 communities to achieve required pollutant load reductions. An important step is to determine how to comply without extensive cost over-runs. This can be the benefit of a comprehensive implementation plan

(which starts with a well-defined watershed model). TMDLs throughout Pennsylvania have varied goals; and thus, can differ on what practices will provide the greatest benefit depending on the community's assigned goals (reduction of sediment, nutrients, etc.). This is why pre-assessments are important before development of the TMDL Design Details. For example, when analyzing one community's contribution of sediment to the Skippack Creek, it was found through the modeling and cost calculator that pollutant reductions could be achieved for four times less with bioretention strategies as opposed to wetland creation, which was initially selected as the community's favored option.

Understanding thoroughly how and where funds are best spent will help prevent overspending to meet these goals. Pre-assessments also provide an excellent means for identifying which projects will need to occur in the earlier permit cycles versus those that can be executed in subsequent cycles.

The process for developing a TMDL Plan generally demands an iterative approach that starts with understanding not only what modes of restoration are plausible but which solutions are optimal for each individual watershed. Once pre-assessments are completed, an overall compliance strategy and schedule will need to be developed, which balances restoration potential and feasibility with the compliance targets, as well as other community priorities (e.g., infrastructure repairs, resolving drainage/flooding issues). The community's TMDL Plan then ultimately defines how implementation is envisioned at the individual watershed level. Your plan may have multiple objectives to accomplish, which presents a challenge in balancing implementation costs with the availability of project opportunities all within a specific timeframe. In short, there is not necessarily a perfect route towards compliance but rather an optimized result that addresses a series of concerns.

#### **4. Development of an individual (or multi-municipal) TMDL plan**

##### ***Strength (and savings) in numbers***

There has been an inherent advantage enjoyed by states such as Maryland and Virginia in the implementation of TMDLs. These states, among others, review and govern at the county level, where in many cases entire watersheds may be contained wholly within the

boundaries of the reviewing district. Pennsylvania faces a more difficult task in meeting these challenges as planning may be much more fragmented due to the state's organization of governing powers, which requires TMDL compliance at the local level. In some cases there may be a dozen or more municipalities sharing responsibilities for a WLA which each community will share a part of. This highlights the concerns of some communities that are densely urbanized who may lack certain options, individually, to comply with pollutant reductions incumbent upon them. Through economy of scale, cooperating with communities within the same watershed may ultimately provide much less expensive options with regards to complying with the pollutant reduction requirements.

##### ***Benefits of multi-municipal cooperation:***

**Analyze Baseline Loading Only Once –** Instead of individually, plan for a group of communities. Savings on planning effort can translate to funds being spent on projects instead of planning that may overlap concurrent efforts of neighboring communities.

##### ***Opportunity to work with local watershed groups (instead of against)***

No one knows more about the stewardship of an individual watershed than the people who volunteer their time and labor to take care of it. Working with your local watershed groups is an important component of the public involvement which is required by the NPDES permit.

##### **Resource sharing**

Sharing of equipment and labor forces provides a mutual benefit for communities participating in a multi-municipal plan.

##### **Grantsmanship**

Multi-municipal planning and implementation projects tend to receive favorable consideration when seeking competitive grants for water quality restoration and protection.

##### **Restoration effectiveness in the big picture**

One very basic principle of watershed science dictates that runoff traveling from many small flow paths will accumulate thereby causing flow rates, and consequently, velocity, to increase further downstream. With regards to the challenge of administering MS4 TMDL obligations at the municipal level, "fragmentation" of community concerns can easily limit the effectiveness of effort put forth in meeting a TMDL. In complying with these standards individually, communities could miss opportunities to share cost in programs that could aid communities further downstream. However, these opportunities may never be realized, due to a lack of communication. Failure to coordinate may limit opportunities for communities who may have a more difficult path to compliance.

#### **5. Load reduction analysis: verification of program benefits**

In the development of a defensible TMDL Plan, it becomes important to verify that your suite of proposed restoration





**“MANY OPTIONS EXIST FOR MS4 COMMUNITIES TO ACHIEVE REQUIRED POLLUTANT LOAD REDUCTIONS. AN IMPORTANT STEP IS TO DETERMINE HOW TO COMPLY WITHOUT EXTENSIVE COST OVER-RUNS. THIS CAN BE THE BENEFIT OF A COMPREHENSIVE IMPLEMENTATION PLAN (WHICH STARTS WITH A WELL-DEFINED WATERSHED MODEL).”**

activities will provide the pollutant reductions required by your permit. This portion of your report will contain

extensive surface water quality analyses (calculations). Through this modeling, the MS4 will verify the benefits of the

proposed plan. As discussed earlier, the subject TMDL Plan was based on a tool that would provide congruency with the original model used for TMDL development. One of the biggest problems with varying models is the potential for inconsistent or regionally incorrect boundary conditions. This can create an obvious incongruence with respect to the precision of the user's analysis, and call into question the validity of the results.

## **6. Program adaptive management**

In general, the scale of these programs is quite large and will take time to fully implement. No one can predict with any certainty what partnerships and cooperatives will or will not form to meet these objectives. The goal should be to predict the most feasible path towards compliance with the partnerships that are in place. The hallmark of any good program is its capability to be dynamic and adaptive enough to consider new partnerships, data, funding opportunities, technologies and methodologies. In execution of your program, be aware that future circumstances may necessitate some variance in decisions made en route to meeting the required pollutant reductions. However, it will be important to document in your future MS4 periodic reports any new directions that are taken, along with quantification of benefits that were realized through programs and restoration activities.

Public outreach and input from the community will be a key factor for determining what modes of compliance will be used in your program. Early involvement with the public is essential in formulating a plan that will achieve the greatest array of benefits for your community.

Good luck in your planning endeavors!

### **GREGORY S. DUNCAN, PE, LEED-AP**

Gregory is a water resources engineer with T&M Associates Consulting Engineers providing TMDL planning and surface water quality modeling services across Pennsylvania. Greg specializes in MS4/TMDL, surface water quality modeling and flood control.

### **SEAN M. FURJANIC, PE**

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# Chesapeake Clean Water Restoration Plan Promises Increased Economic Benefits Throughout Region

BY JOHN SURRICK, CHESAPEAKE BAY FOUNDATION

**T**he economic benefits provided by nature in the Chesapeake Bay watershed will total \$130 billion annually when the Chesapeake Clean Water Blueprint, the regional plan to restore the Chesapeake and its rivers and streams, is fully implemented, according to a recent peer-reviewed economic analysis. The study, released by the Chesapeake Bay Foundation (CBF), found that the benefits will approach \$40 billion a year in Pennsylvania.

The report looked at the many benefits provided by the Bay, its rivers, forests, farms, and wetlands. These benefits from an improved environment – which include cleaner water, cleaner air, hurricane and flood protection, recreational opportunities, and fresh, healthy agricultural products and seafood – extend throughout the Chesapeake's 64,000-square-mile drainage basin, from headwater streams to the Atlantic Ocean.

The report, produced by economist Dr. Spencer Phillips and CBF Senior Scientist Dr. Beth McGee, compared the value of the benefits in 2009, the year before the Chesapeake Clean Water Blueprint was initiated, to the benefits that can be expected as a result of fully implementing the cleanup plan. Similar “ecosystem services” studies have been produced for many other regions, including the Everglades, Mississippi River Delta, and Puget Sound.

The CBF report estimates the value of natural benefits from the pre-Blueprint Chesapeake Bay watershed, even in its polluted and degraded condition, at \$107 billion. Once the Blueprint is fully implemented, that amount grows by 21

percent to nearly \$130 billion a year. Equally telling, if the region relaxes efforts and does little more to clean up the Bay and its rivers and streams than what has been done to date, pollution will worsen and the value of nature's benefits will decline by almost \$6 billion.

“We all know that reducing pollution makes great sense for our health and our environment,” said CBF President William C. Baker. “The study shows that it makes good economic sense as well. As a result of fully implementing the Chesapeake Clean Water Blueprint, the benefits nature

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provides to us will increase in value by more than \$22 billion annually throughout the watershed. And we reap those added benefits every year."

The study suggests that the cleanup plan will provide significant benefits to Pennsylvania's economy. These benefits include improved recreational opportunities like fishing, healthier and more productive farmland, and reduced treatment costs for drinking water. Once the Blueprint is fully implemented, and the benefits fully realized, the value of the services provided by nature in the Commonwealth would increase by more than \$6 billion annually, from \$32.6 to \$38.8 billion.

"This report clearly validates that there is a real and measurable return on the investment Pennsylvanians have made in clean water for their local rivers and streams, and the Bay," said Harry Campbell, CBF's Pennsylvania Executive Director. "With this report, Pennsylvanians can be assured that cleaning up our waterways will have direct and tangible benefits to the citizens of the Commonwealth."

According to the Pennsylvania Department of Environmental Protection's (DEP) most recent statewide water quality survey, nearly one-quarter of the Commonwealth's waterways are polluted – largely by agricultural and urban/suburban polluted runoff. To ensure clean, healthy water for future generations and meet commitments under the cleanup plan, Campbell said the state should focus its efforts in three key areas:

- Through education, outreach, and technical assistance, DEP should accelerate efforts, programs, and funding to ensure that farmers are meeting Pennsylvania's water quality protection laws.
- The Commonwealth should accelerate the planting of streamside forested buffers, which are the most cost-effective pollution-reduction practice available.
- The state should assist local municipal officials with efforts to decrease polluted runoff from our urban and suburban areas.

The economic report also identified impressive annual gains in other Bay states from fully implementing the Blueprint. Virginia would see an increase of \$8.3 billion, Maryland \$4.5 billion, New York \$1.9 billion, West Virginia \$1.3 billion, and Delaware \$205 million.

CBF's study addressed only benefits, not costs. Although there are no recent estimates of the total costs of implementation, a 2004 estimate put costs in the range of roughly \$6 billion per year. Considering federal, state and local investments in clean water in the 10 years since that time, CBF estimates the current number is closer to \$5 billion annually. And once capital investments are made, the long-term annual operations and maintenance costs will be much lower.

"The result is that the Blueprint will return benefits to the region each year at a rate of more than four times the cost of the clean-up plan," said CBF President Baker.

The complete report can be found at [cbf.org/economicbenefits](http://cbf.org/economicbenefits). ♦



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# Whiz Quiz

## Pumps and Hydraulics

Answers  
can be  
found on  
page 64

- 1 The impeller in a centrifugal pump can be either open or closed.  
a. True                      b. False
- 2 This condition occurs when a liquid passing through a pump vaporizes resulting in reduced efficiency and increased wear and tear to the pump.  
a. Centrifugal              b. Cavitation  
c. Combustion              d. Cartwheeling
- 3 The vertical distance from a free water surface to a reference point below the surface is \_\_\_\_\_. The units for this is often expressed as feet of water.  
a. Height                      b. Velocity  
c. Hydraulic radius          d. Head
- 4 The two devices used most often to measure open channel flow rate are \_\_\_\_\_.  
a. Flumes and weirs  
b. Flumes and a stop watch  
c. Stop watch and weirs  
d. Stopwatch and dye
- 5 One disadvantage of using a weir for influent wastewater flow measurement is the dead zone upstream of the weir. The dead zone can collect solids and debris causing odors or affect the accuracy of the flow measurement.  
a. True                      b. False
- 6 A wet well is 12 ft. long and 10 ft. wide. The influent valve to the wet well is closed. If a pump lowers the water level 2.6 ft. during a 5 min pumping test, what is the calculated pump flow in GPM?  
a. 16                          b. 80  
c. 467                          d. 520



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# Got Fleet GPS?

BY MIKE NELSON

## SAVE BIG BUCKS WITH A FLEET ARMED WITH TELEMATICS

Klew is lying under the steering wheel, "I think this gizmo goes right here."

Lenny Lotech is on the floor of the passenger side. "Klew, I am not good at this technical stuff, so I can't help."

"There is the OBD. This fits right in there — got it."

"What's an OBD?"

"On-Board Diagnostics is a computer-based system built into all 1996 and later light-duty vehicles and trucks."

### What is going on here?

#### Let's start at the beginning.

Klew Less is a plant manager at the Western Lackluster facility. Lenny Lotech belongs to the Society for the Prevention of Automation (SPA). Its mission is to find automated systems and gather enough information to trash them in their newsletter.

About two months ago, Klew's board asked him to look into making the fleet "smart." Klew is now taking the first steps to develop a smart fleet. Lenny heard through the grapevine that Klew was moving toward this technological achievement and is there to gather enough intelligence to debunk the idea.

"Well, now that you have that gizmo installed, what will happen?"

"Len, the vehicle is now wired and will transmit information about its operation to a web-based fleet management application. The system analyzes the information and provides reports."

"This sounds very complicated and probably won't work."

Klew replies, "It has worked in many fleets."

"Yeah... well, name one!"

Klew hands Lenny a schematic for his review.



"OK, but what kind of information does it allegedly collect?"

"Lenny, some systems can collect

up to 200 metrics. Common information includes vehicle

- Location
- Acceleration
- Idle time
- Improper cornering.
- Speed
- Deceleration
- Hard brake count

"Okay, Klew, so you collect all this information. Except for spending gobs of money on this techno stuff, how does it benefit your operation?"

"Lenny, look over here at the white board for a short list of benefits."

- 1) Turn safety into tangible benefit fleets can measure
- 2) Improve fuel efficiency
- 3) Reduce maintenance costs
- 4) Develop more loyal and professional driver pool
- 5) Improve customer service
- 6) Reduce risk

"Well, I will certainly need more information about any of these supposed benefits."

"Certainly, let's start with making safety a tangible benefit. The information being collected identifies specific behaviors of the drivers. "The report is automatically generated and compares instances of acceleration (rapid starts), deceleration (hard braking), speeding and idle time for the current month, past month and year. This information can be used to counsel poor or aggressive drivers and praise the good drivers. Specific training programs to address driving concerns can now be targeted to the right employees instead of employing a generalized training approach. Action items can be developed for specific drivers to help them improve."

"Regarding Benefit 2, Lenny, did you know that up to 33% of a vehicle's fuel efficiency is impacted by driver behavior? Also, speeding has a huge impact on fuel economy. On average, operators can expect a vehicle to lose 7% of its fuel economy for every five miles per hour exceeding 65 MPH."

"These things make sense, but with gas being cheaper this year than last, we should worry about other things."

"Well, let's move along to maintenance costs. Many of these systems wirelessly send diagnostics such as check engine light, and other operating characteristics directly to the maintenance shop. There are also automated reminders for preventative maintenance and tune-ups. By making this information readily available, timely maintenance is performed. Additionally, since driver behavior has improved, there is

less rapid acceleration and hard braking. This reduces wear and tear on the vehicle."

"Klew, how does this system develop a more loyal and professional driver pool?"

"Lenny, the drivers feel more accountable for their performance and become more conscientious. Because detailed information is now available, the likelihood of personalized coaching and training is possible. Personal scorecards help drivers understand and improve their performance. With the advent of this system, the drivers better understand their role in the organization and morale increases.

"Next, let's address the customer. Customer service and relations can be improved in a variety of ways. More efficient routes can be developed, which means the customer gets better service for the same cost. With GPS tracking information, dispatchers can determine the closest crew to send to the scene. This decreases customer response time.

"Finally, risk is reduced because driver behavior has improved. This corresponds to fewer accidents and lowering of all associated costs. Some case histories indicate that a 25-30% accident reduction is not uncommon.

"Mr. Lotech, any thoughts?"

Lenny mumbles something under his breath and tells Klew to refer to his next SPA newsletter for his official comments.

Three weeks later Klew gets a copy of the SPA newsletter. Lenny's remarks are predictable and in keeping with the company line.

#### **Secretary for the Prevention of Automation**

*Telematics is just another excuse to spend money. It strips the workers of their privacy and is Orwellian. If they want driver improvement, just put a bumper sticker on the vehicle: "1-800 How's my driving?"*

*This costs less and might work.*

#### **About the Author**

Mike Nelson is Past President of PWEA. He heads his own firm that specializes in helping utility managers improve their operations through coaching and training. Mike is a PADEP certified trainer and offers numerous courses for operator contact hours and to prepare the operator for DEP exams. Mike is a licensed operator and professional engineer. Refer questions or comments to [mnelsonh2o@aol.com](mailto:mnelsonh2o@aol.com). His website is [www.miknelsonh2o.com](http://www.miknelsonh2o.com). ♦

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# Emergency Preparedness and Industrial Pretreatment

BY JUDY F. MUSSELMAN, BCES, QEP,  
SENIOR ENVIRONMENTAL SCIENTIST, GHD, HARRISBURG, PA

**T**here are several regulatory emergency preparedness requirements and recommendations for wastewater treatment facilities in Pennsylvania, including, but not limited to, those described below.

- (1) Preparedness, Prevention and Contingency (PPC) Plans required by NPDES permits for potential spills and leaks that may discharge to on-site stormwater outfalls, subsequently introducing pollutants into a receiving stream that may cause harm to the public and the environment, in accordance with 25 Pa. Code § 91.34.
- (2) Spill Prevention Countermeasures and Contingency (SPCC) Plans for facilities storing more than 1,320 gallons of petroleum products in aboveground storage tanks and which have the potential to spill oil into navigable waters or adjoining shorelines in quantities that may be harmful, as required under the federal *Oil Pollution Prevention Act* and regulations at 40 CFR § 112.
- (3) Local Emergency Planning Commissions (LEPCs) maintain lists of regulated hazardous chemicals used, manufactured or stored at facilities,

which may include wastewater treatment facilities that use and store chemicals such as Alum, Chlorine, Methanol and Diesel Fuel No. 2. LEPCs develop plans for responding to emergencies based on the chemicals stored at facilities within that county. POTWs must file Tier II report forms each year to the PA Department of Labor and Industry, the LEPC and to the local fire department if such regulated hazardous chemicals are used or stored at their facilities.

- (4) The U.S. Department of Homeland Security (DHS) Office of Health Affairs (OHA) Chemical Defense Program, partnered with Department of Health and Human Services (HHS), Office of the Assistant Secretary for Preparedness and Response (ASPR) and a working group comprised of various partners to research and write "Patient Decontamination in a Mass Chemical Exposure Incident: National Planning Guidance for Communities." This guidance focuses on providing options for responses to events like chemical releases and mass casualties. It is intended to support state and local civilian first responders

and healthcare receivers, along with emergency managers, public health practitioners, law enforcement officials, and risk communications experts who are the nation's first line of defense, and must be prepared to respond to potential chemical incidents. Events that triggered development of this guidance included the chemical spill in Charleston, West Virginia, which occurred more than a year ago and affected the water supply. It is prudent for a community to be aware of the potential dangers in their water and sewer service areas.

- (5) Emergency preparedness is also required for response to problems that may arise due to natural disaster events such as floods, tornados, hurricanes, snowstorms and earthquakes; or local disasters such as fires, nuclear threats or hazardous materials incidents that may occur near a POTW. Such disasters may cause pollutants to enter the water and/or sewer systems as well as cause power outages or damage treatment process units and associated structures and equipment. The Pennsylvania Emergency Management Agency



**"KEEP IN MIND THAT THE LOSS OF WASTEWATER TREATMENT FACILITIES OR INTERRUPTION OF TREATMENT CAPABILITIES MAY RESULT IN SERIOUS IMPACTS TO PUBLIC HEALTH AND THE ENVIRONMENT, AND MAY POTENTIALLY HAVE AN ECONOMIC IMPACT TO THE COMMUNITY."**

(PEMA) and the Federal Emergency Management Agency (FEMA) have guidelines available to develop emergency preparedness plans. LEPCs in Pennsylvania have prepared County Emergency Operations plans to address such natural and man-made disasters as well.

(6) Pandemic flu guidance is available through the DHS for affected facilities to plan and prepare in the event of severe staff shortages due to widespread flu.

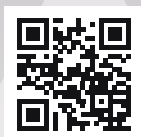
(7) More recently, guidance was developed by the Center for Disease Control and Prevention (CDC) in collaboration with the Water Environment Federation (WEF) for the wastewater sector in dealing with the Ebola virus if there is potential for the virus to enter the sewer system from known cases of Ebola at local hospitals. The document is entitled "Interim Guidance for Managers and Workers Handling Untreated Sewage from Suspected or Confirmed Individuals with Ebola in the U.S." The CDC indicates that this guidance is only applicable to those POTWs that

treat wastewater discharged from a healthcare facility treating patients diagnosed with Ebola. At the time of this writing, there are four healthcare facilities identified in Pennsylvania that are approved by the CDC to treat patients with the Ebola virus. These facilities include Children's Hospital of Philadelphia, Hospital of the University of Pennsylvania in Philadelphia, Lehigh Valley Health Network in Muhlenberg, and Penn State Milton S. Hershey Medical Center in Hershey.

Now, one may ask, how does emergency preparedness tie into a POTW's industrial pretreatment program? One of the first steps in developing an industrial pretreatment program is to conduct a survey of all non-residential establishments in the sewer service area. The survey results will reveal if there are any facilities that not only discharge to the sewer system but may have a broader impact to the community, such as a petroleum tank farm, a chemical manufacturer, a nuclear power plant or a hospital. Much like the DHS Water Sector-Specific Plan, which is part of the overall National Infrastructure Protection

Plan, a pretreatment program identifies contributing facilities to the sewer system and assesses the risk to the wastewater treatment plant and receiving stream. Keep in mind that the loss of wastewater treatment facilities or interruption of treatment capabilities may result in serious impacts to public health and the environment, and may potentially have an economic impact to the community.

There are many organizations that have guidance documents available for development of comprehensive Wastewater Emergency Response Plans, including, but not limited to, the Water Environment Research Foundation (WERF), EPA and AWWA. EPA has developed software for assessing risks in water and wastewater systems known as the Vulnerability Self-Assessment Tool (VSAT). EPA and other trade associations have also established the Water/Wastewater Agency Response Network (WARN) to provide expedited access to resources needed to respond to and to recover from natural and man-made disasters. WARN is open to both private and public utilities. Now is the time to prepare if you have not already done so. 💧



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# Is Biosolids Use a “Normal Agricultural Operation?”

BY DIANA GARVEY, GARVEY RESOURCES, INC.



**T**here is a Supreme Court decision brewing that will not only affect many wastewater treatment plants who produce biosolids for beneficial use, but also the farmers who rely on the land application of these biosolids as fertilizer for their crops.

In 2014, Synagro, along with a group of landowners who had been sued by a citizen's group for alleged water and air pollution due to the land application of biosolids, won a favorable judgement from the Court of Common Pleas of York County. The Court ruled that the use of biosolids in farming is a

“normal agricultural operation” under the *Pennsylvania Right to Farm Act*, as a matter of law<sup>1</sup>. This status means that a one-year “statute of repose” protects farms using biosolids from nuisance suits. In 2014, however, the citizen's group appealed this decision to the Pennsylvania Superior Court. This court reversed the lower court's decision regarding the definition of “normal agricultural operation” and decided that municipalities must allow juries to make decisions about its meaning on a case-by-case basis. Since local definitions of “normal agricultural operation” may

vary, under this ruling the beneficial reuse of biosolids on farms could be unprotected by the Right to Farm Act and therefore subject to tort suits. Historically, the *Pennsylvania Right to Farm Act* was created by the General Assembly in order to protect farmers from litigation (usually related to odors) over their normal agricultural operations. Synagro and the landowners contend that the Common Pleas Court was correct in their decision that biosolids application on farmland is a normal agricultural operation and requested that the Pennsylvania Supreme Court review this decision. Their request for a hearing was granted.

Kudos to the PWEA Board of Directors for taking action on behalf of its members. During the Superior Court case in 2013, Randall Hurst of Mette, Evans & Woodside was authorized by PWEA Board of Directors, Mid-Atlantic Biosolids Association (MABA) and Pennsylvania Septage Management Association (PSMA) to prepare a brief in support of Synagro. He has now been authorized by the same three entities to produce an *Amicus Curiae Brief* for submission to the Supreme Court supporting the beneficial use of biosolids and requesting that the court include the use of biosolids on farmland in the definition of “normal agricultural operation” as it appears in the *Pennsylvania Right to Farm Act*.

In his brief to the Supreme Court, Randy states that sewage and septage,



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when processed as biosolids, have been proven to be a valuable resource to farmers when used as a fertilizer, which is a widely accepted practice in the farming community. Over 700 farms in Pennsylvania currently use biosolids as a fertilizer and to improve soil quality. The brief explains that the "beneficial reuse of sewage sludge in the form of biosolids... is comprehensively governed by federal and state agricultural and environmental regulations." As such, its use is regulated under the *Pennsylvania Nutrient Management Act* which requires that the application of biosolids must be limited to the "agronomic rate" of the crop to be grown, thus underscoring the agricultural nature of biosolids use. This is an important concept. The brief goes on to state that because of this regulation, the practice of land applying biosolids on farms "is functionally and legally indistinguishable from the application of chemical fertilizers and manure."

In summary, the brief requests that the Supreme Court consider and review the laws and regulations regarding the use of biosolids as a fertilizer in order

to reverse the decision of the Superior Court and reaffirm the decision of the Court of Common Pleas of York County. If, however, the Superior Court's ruling is allowed to stand, the interpretation of biosolids use as a "normal agricultural operation" would be left up to each municipality to decide through the opinion of a jury on a case-by-case basis. The concern is that the risk of a jury finding that biosolids use is not a normal agricultural operation could dissuade farmers from accepting biosolids for recycling, thereby impacting the ability of POTWs to land apply biosolids.

At this writing, additional briefs in support of Synagro et al.'s position have been filed with the Pennsylvania Supreme Court by the City of Philadelphia and by the following groups: jointly by the Pennsylvania Municipal Authorities Association (PMAA), ALCOSAN and National Association of Clean Water Agencies (NACWA); jointly by the Pennsylvania Farm Bureau (PFB) and PennAg Industries Association; and jointly by the Pennsylvania Attorney General and Department of Agriculture.

The Pennsylvania Department of Environmental Protection (DEP) filed a supporting brief in the Superior Court appeal but declined to do so with the Supreme Court appeal.

It is anticipated that an opinion from the Supreme Court will be rendered by the end of 2015.

*Randy Hurst, Esq. did an excellent job preparing this argument on behalf of PWEA and the others for a very reasonable fee. If you have any questions or wish more information, contact Randy Hurst at [rghurst@mette.com](mailto:rghurst@mette.com)*

<sup>1</sup> It is interesting to note that PA Act 101 (Municipal Waste Planning, Recycling and Waste Reduction Act) defines biosolids land application as a "normal agronomic practice."

<sup>2</sup> "Agronomic rate" refers to the measure of the nutrient needs of the crops to be grown, taking into consideration all of the nutrients supplied by biosolids, manure, and chemical fertilizers applied by the farmer. 💧



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# Management Is the Keystone

## How is Your Utility Doing? A Self-assessment Guide to Benchmark Performance

MARK PICKERING, PE, GHD

This is a part of the series of columns about the Effective Utility Management Collaborative Effort (effort), a national initiative supported by EPA, WEF, NACWA, APWA, AWWA, AMWA and NAWC. The PWEA Utility Management Committee sponsors this column to raise awareness of the management issues facing utilities in Pennsylvania. As part of the effort, Ten Attributes of Effectively Managed Water Sector Utilities ("attributes," described below) were developed to provide benchmarks for a utility manager to help improve utility performance. These attributes provide guidance on management and operations practices, infrastructure condition assessment, customer satisfaction, community welfare, natural resource stewardship, and financial performance.

### 10 Important Attributes

Too often we measure success only by a utility's ability to meet permits and maintain low rates, without focusing on the long-term health and sustainability of the utility. A more comprehensive approach to measure long-term success includes consideration of how a utility performs within the following attributes (covered in more detail in previous articles):

1. **Product Quality (PQ):** Transports and delivers a treated product that meets all regulatory requirements and customer expectations.
2. **Customer Satisfaction (CS):** Delivered product is reliable, affordable, meets customer demands, and responds to customer feedback.
3. **Employee and Leadership Development (ED):** Utility workforce is adaptive, self-motivated, trained, collaborative, and has opportunities to advance within the organization.
4. **Operational Optimization (OO):** Ensures sustainable performance,

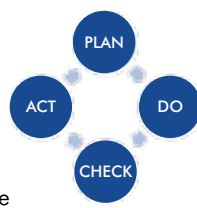
minimizes resource use and losses, maintains awareness of technology developments to adapt and improve.

5. **Financial Viability (FV):** Uses life-cycle costs to maintain a balance between capital, operating, debt, and long-term planning. Able to project and control rates that are suitable for utility health and community affordability.
6. **Infrastructure Stability (IS):** Understands critical level of service and condition of utilities; maintains and enhances critical level with acceptable risks for long-term viability.
7. **Operational Resiliency (OR):** Proactively anticipates problems and future needs and develops methods of managing all forms of business risks including legal, regulatory, environmental, safety and security consistent with industry trends and goals.
8. **Community Sustainability (SU):** Aware and attentive to how utility decisions of ownership and operations affect the population and ecological community. Manages the utility to help protect, preserve, and improve the health and vitality of the service area communities.
9. **Water Resource Adequacy (WA):** Ensures supply and capacity consistent with current and future customer needs through long-term capacity and treatability, infiltration and inflow reduction, and public education. Explicitly considers its role in capacity availability and manages operations to provide for long-term aquifer and surface water sustainability and replenishment.
10. **Stakeholder Understanding and Support (SS):** Actively engenders and involves stakeholders with decisions on service levels, rate structures, operating budgets, capital improvements, and risk management structures.

This column will focus on a basic self-assessment test of how the reader's utility performs. Once the reader has gained an understanding and appreciation of how each attribute applies to their specific utility, this test will allow the reader to identify, through a series of steps, attributes that need improvement. Using this simple evaluation, if answered honestly, can be part of a utility's periodic practice for continual improvement, where periodic (e.g., annual) measurement of the utility's achievements and relative ranking of the importance each attribute is seen as critical for long-term success.

After all, you can't improve what you don't measure. Measurements, while through this test result in relative numerical rankings of performance and level of importance, should be viewed within the context of continual improvement. When used within a simple "Plan-Do-Check-Act" cycle, this test will help the reader's utility to engage in a periodic evaluation of success and identify future needs for improvement.

This "Plan-Do-Check-Act" continual improvement framework can also be enhanced by using gap analysis, establishment of standard operating procedures, internal trend analysis and external benchmarking, best practice review, and other continual improvement tools. The framework can help utilities understand improvement opportunities and establish explicit service levels, guide investment and operational decisions, form the basis for ongoing measurement, and provide the ability to communicate clearly with customers and key stakeholders.



### Rate the Attributes

The following self-assessment test follows the format used within the Primer<sup>1</sup>, an outcome of the national effort. Using the ten attributes, on a 1-to-5 scale (described

below), rate how your utility currently performs. Consider the degree to which your current management systems effectively support each of the Attributes and their component parts. Consider all components of each attribute and gauge your rating accordingly. Use these descriptions to guide your rating:

RATE	DESCRIPTION
1	Effective, systematic approach and implementation; consistently achieve goals
2	Workable systems in place; mostly achievable goals
3	Partial systems in place with moderate achievement, but could improve
4	Occasionally address this when specific need arises
5	No system for addressing this

Mark your answers in the Step 1: Rate Achievement column below.

Now, rank the importance of each attribute to your utility, based on your utility's vision, goals, and specific needs. The ranking should reflect the interests and considerations of all stakeholders (managers, staff, customers, regulators, elected officials, community and watershed interests, shareholders, and others). Rank the attributes by the level of importance from 1-10, considering the long-term viability of your utility. The most important attribute should be ranked 1, the second most important 2, and so on. The least important attribute should be ranked 10. Your ranking of each attribute's importance might be influenced by current or foreseeable challenges in that particular area, recent accomplishments in addressing these issues, or other factors. The ranking should take into effect the current state of the utility, as importance ranking is likely to change over time as internal and external conditions change. This is one reason why it is important to perform periodic evaluations.

Once you have the Attribute importance ranking from 1-10, mark your answers in the Step 2 column of the table below. As you fill in numbers, note that your analysis for Step 1 (rating achievement) should be separate and independent from your analysis for Step 2 (ranking importance).

	STEP 1: RATE ACHIEVEMENT	STEP 2: RANK IMPORTANCE
PQ		
CS		
ED		
OO		
FV		
IS		
OR		
SU		
WA		
SS		

Now, graph your results using the table below, using the rating and ranking numbers to position the attribute. Once completed, the graph should identify attributes that fall into or near the "gray" area of the graph that may need to be evaluated further for improvement

Achievement Rating	Lower	5											
		4	PQ										
		3					CS						
	Higher	2									ED		
		1											
		1	2	3	4	5	6	7	8	9	10		
		More Important					Less Important						
		Ranking											

within your utility. As an example below, Product Quality and Customer Service, while more important to a utility, achieve a lower performance rank and fall into the gray area. These attributes may need to be improved to meet the utility's expectations for performance.

## Outcome

Did your assessment identify any attributes that need to be improved? Did this brief self-assessment create any interest in focusing on the areas identified as needing improvement? If so, what actions should you now take to improve? Again, this assessment, while a snapshot of current attribute performance, should play a critical role within the continual improvement management framework.

## Benefits

If used within a continual improvement framework, the outcome of and actions of this self-assessment include:

- Periodic, honest utility assessment to identify management strengths, areas for improvement, priority needs, and other areas of importance.
- Conducting routine sessions among interested parties to identify improvement opportunities.



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- Following up on improvement projects under way.
- Establishing and implementing performance measures and specific internal targets associated with those measures.
- Defining and implementing improvements to related operational requirements, practices, and procedures.
- Establishing supporting roles and responsibilities.
- Implementing measurement activities such as regular evaluation through operational and procedural audits.

If you have completed the self-assessment test, congratulations, you have taken a step to measure how your utility performs within the ten attributes listed. Now it is time to engage the decision makers to form the basis for ongoing measurement, understand what improvement opportunities exist, and guide future investment and operational decisions.

#### Reference:

- <sup>1</sup> "Effective Utility Management: A Primer for Water and Wastewater Utilities (EUM)"  
<http://www.watereum.org/resources/>

#### About the Author:

**MARK PICKERING, PE** is a Senior Project Manager at GHD's Harrisburg office. Mark has over 28 years of wastewater expertise and experience in wastewater planning, design, and project management, and is an active member of the PWEA Utility Management Committee. Refer questions about this article to [mark.pickering@ghd.com](mailto:mark.pickering@ghd.com). ♦

# Safety Quiz

By Scott L. Armbrust, PE, Associate, Hazen and Sawyer

- 1** How often should you receive a flu shot?
  - a. Every year
  - b. Every 2 years
  - c. Every 3 years
  - d. Every 5 years
- 2** How often should you get a tetanus shot?
  - a. Every year
  - b. Every 3 years
  - c. Every 5 years
  - d. Every 10 years
- 3** Where should you wash your work clothes?
  - a. At work
  - b. At home
  - c. At a local laundromat
  - d. Don't wash them
- 4** If you get doused with wastewater, you should
  - a. Remove clothes
  - b. Take a shower
  - c. Go directly home
  - d. Both A & B
- 5** When is it alright to eat food in a wastewater treatment plant lab?
  - a. When you are hungry
  - b. When you are wearing safety gloves
  - c. When you are done testing samples
  - d. Never



**ANSWERS** are on page 64



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## PENNTec 2015

Pennsylvania Water Environment Association

CONFERENCE  
INFORMATION

May 31-June 3, 2015

Lancaster County Convention Center &  
Lancaster Marriott at Penn Square  
Lancaster, PAA Message from  
the PWEA President and the Conference Committee Chair

On behalf of the PWEA Board of Directors and the 2015 Conference Committee, we invite you to attend PWEA's 87th Annual Technical Conference and Exhibition (PennTec 2015) on May 31-June 3 at the Lancaster County Convention Center & the Lancaster Marriott at Penn Square in Lancaster, PA.

This year's Conference Program includes a wide range of topics related to water quality. In addition to the Conference technical sessions, we are also presenting workshops which have been approved by the PA DEP for additional contact hours for water and/or wastewater operator licenses. By attending these workshops, you could earn **up to 19 DEP contact hours, or up to 15 Professional Development Hours**, in just a few days!

A very important part of the Conference is the vendor exhibition. By visiting the exhibits, you will gain insight into new and innovative solutions and discover new products and equipment that will help you do your job in a more efficient and safer manner. We encourage you to talk to the vendors about what is most important to you.

The Conference includes networking opportunities for you to meet and interact with your colleagues. There will be a Welcome Reception on Sunday night. The President's Beer & Wings Reception will be in the Exhibit Hall on Monday evening. The Annual PWEA Dinner and Awards Ceremony will be held on Monday night. The Beer & Pretzels Reception and the "Are You Smarter Than a Young Professional" Trivia Challenge are on Tuesday.

We believe the PennTec Conference will provide everything you need under one roof—education, vendor contacts, and networking. We look forward to seeing you there!



*Brian Book*  
Chair, PennTec 2015  
Conference Committee



*Dan Slagle*  
PWEA President

To view the entire Conference Program and other information,  
go to [www.pwea.org](http://www.pwea.org) and click on the PennTec 2015 logo.



# CONFERENCE AT A GLANCE

(as of February 6, 2015)

Visit [www.pwea.org](http://www.pwea.org) for the most current program schedule.

## Sunday, May 31

8:30am-3:00pm  
3:00-6:00pm  
5:30-6:30pm

Golf Tournament  
Registration Open  
Welcome Reception

## Monday, June 1

7:00am-4:30pm  
7:30-9:00am  
7:30am-4:30pm  
  
7:30am-5:30pm  
8:15-11:00am

Registration Open  
Continental Breakfast in Exhibit Hall  
Young Professionals (YP) Lounge  
Social Media Learning Lounge  
Exhibit Hall Open

### Morning Technical Programs

*Collection Systems*  
*Engineering*  
*Professional Wastewater Operations*  
*Stormwater*  
*Utility Management*

### Workshops

*Activated Sludge Refresher Course*  
*Securing Drinking Water & Wastewater Treatment Facilities*  
*Troubleshooting Activated Sludge & BNR Processes*

8:00am-5:30pm  
8:15am-4:30pm

8:15am-4:30pm

11:00am-1:45pm

Exhibit Hall Break  
Complimentary Lunch

12:30-1:00pm

Annual Business Meeting  
with Dessert & Coffee

1:00-3:30pm

PWO Plant Tour

1:45-4:30pm

### Afternoon Technical Programs

*Collection Systems*  
*Engineering*  
*Stormwater*  
*Utility Management*

4:30-5:30pm

President's Beer & Wings Reception  
in Exhibit Hall

6:00-9:00pm

PWEA Awards Ceremony  
and Annual Dinner

## Tuesday, June 2

7:30am-4:30pm  
7:30-9:00am  
7:30am-4:30pm

Registration Open  
Continental Breakfast in Exhibit Hall  
Young Professionals (YP) Lounge  
Social Media Learning Lounge  
Exhibit Hall Open

### Morning Technical Programs

*Biosolids*  
*Collection Systems*  
*Engineering*  
*Industrial Waste Pretreatment*  
*Water Sustainability & Reuse*

Research Student Podium Presentations

8:15-11:00am

### Workshops

*National Safety Council Defensive Driver Course*  
*Activated Sludge Refresher Course*  
*Introduction to Wastewater Treatment Laboratory Supervisor Training*

7:45am-12:00pm

8:00am-5:30pm

8:15am-4:00pm

8:15am-4:30pm

9:00am-12:00pm

11:00am-1:45pm

Operations Challenge

Exhibit Hall Break

Complimentary Lunch

Research Student Poster Presentations

Career Fair in YP Lounge

### Afternoon Technical Programs

*Biosolids*  
*Collection Systems*  
*Industrial Waste Pretreatment*  
*Water Sustainability & Reuse*

Young Professionals Program

Beer & Pretzels Reception in Exhibit Hall

Operator Olympics in Exhibit Hall

Closing Announcements in Exhibit Hall

Social Event - "Are You Smarter Than a Young Professional" Trivia Challenge

## Wednesday, June 3

7:30-9:00am  
7:45-11:45am  
8:15-11:00am

Continental Breakfast  
Registration Open

### Morning Technical Programs

*Construction*  
*Professional Wastewater Operations*  
*Finance*

### Workshop

*Fats, Oils and Grease (FOG) Workshop*

Conference Concludes

8:15-11:30am

11:30am

## What's included with your Conference Registration?

	Regular Conference Sessions	Sunday Networking Reception	Monday Exhibit Hall; Continental Breakfast; Breaks; Lunch; President's Reception	Monday Plant Tour	Monday Annual Dinner	Tuesday Exhibit Hall; Continental Breakfast; Breaks; Lunch; Reception	Tuesday YP Social Event	Wednesday Continental Breakfast; Break	Workshops
Full Conference	Yes	Yes	Yes	No	Discounted	Yes	No	Yes	No
Monday only	Yes	No	Yes	No	No	No	No	No	No
Monday only, YPs	Yes	Yes	Yes	Yes	No	No	No	No	No
Tuesday only	Yes	No	No	No	No	Yes	No	No	No
Tuesday only, YPs	Yes	No	No	No	No	Yes	Yes	No	No
Wednesday only	Yes	No	No	No	No	No	No	Yes	No
Guest Registration	No	Yes	Yes	No	No	Yes	No	Yes	No

## INVITING ALL YOUNG PROFESSIONALS

The Pennsylvania Water Environment Association would like to offer a special invitation to Young Professionals (YPs) thinking about coming to PennTec 2015. YPs have been participating in a number of social and service events over the years and are aiming to continue building the program. The YP Committee is looking forward to seeing you at PennTec.

A special registration category is available for YPs who wish to attend the Conference on Monday or Tuesday. The discounted YP fee includes access to the Exhibit Hall and regular educational Conference sessions, plus continental breakfast, breaks and lunch. This registration also includes a ticket for the Plant Tour on Monday or the Tuesday evening "Are You Smarter than a YP?" Challenge.

Come join us at the YP Lounge on Monday and Tuesday. This is a great place for YPs to take a break between sessions and to network with other YPs. Not a YP member yet? It's easy to sign up. Membership applications will be on hand.

YPs should plan to attend the Tuesday Young Professionals Program designed specifically for them.

New this year - the YP Committee will host a Career Fair. See below for details.

The YP Committee is planning the Tuesday Night Event and we invite you to stick around and join in for a few rounds of "Are You Smarter than a Young Professional?" Test your knowledge of wastewater-themed trivia against YPs and Seasoned Professionals alike. Play on your own or join a team. Prizes, refreshments and drink tickets will be provided.

On the Conference registration form, there is a box that you can check indicating if you are age 35 or younger. Driver's license ID is required when you check in on-site. You will be given a colored lanyard designating your YP status.

The YP Committee has a number of events planned for 2015 and is looking forward to your participation.

*Steve Kestel*

Chair, Students & Young  
Professionals Committee

*Chase Kelch*

Vice-Chair, Students & Young  
Professionals Committee

### YP Career Fair

Tuesday, 12:45-2:45pm



New this year! The YP Committee will be hosting a Career Fair to provide an opportunity for young professionals to meet prospective employers in the water/wastewater sector. The event will kick off with a short presentation from a senior member of PWEA who will discuss the status of the industry and employment opportunities, followed by short presentations from employers in the various aspects of the industry, and open time for prospective employees to talk with employers in attendance.

Participating companies/organizations (engineering firms, consultants, wastewater reclamation facilities, Municipalities, Authorities etc.) will be provided an area to meet with students/job seekers and interested YPs. Prior the event, flyers will be sent to Pennsylvania Universities and Colleges to provide information about the event, including a list of companies/organizations in attendance and potential job opportunities available in this field. Students will be instructed to sign up prior to the event and to bring copies of their resume to the event. Companies interested in participating in the Career Fair can register online at [www.pwea.org](http://www.pwea.org), or they can contact Chase Kelch via email [ckelch@larsondesigngroup.com](mailto:ckelch@larsondesigngroup.com).

### 2015 Annual Business Meeting

Notice is hereby given that the Annual Business Meeting of the Pennsylvania Water Environment Association will be held on Monday, June 1, at 12:30pm at the Lancaster County Convention Center in Lancaster, PA.

# GENERAL INFORMATION

## Conference Registration

You may register for the full Conference or at the daily rate. Access to the Exhibit Hall is included for the day(s) covered by your registration. You must be a member of PWEA or WEF/PWEA to qualify for Member rates.

## Registration Confirmation

Confirmations will be sent by email. Please be sure to include your email address on your registration form.

## Online Registration

To register online, go to [www.pwea.org](http://www.pwea.org), click on the PennTec logo, then click the Register button to go to our secure website. Online registration is only available with credit card payment. A 3% processing fee will be added to all online registrations.

## Guest Registration

One guest may register at no charge with each FULL Conference registration. Daily and discounted registrations do not qualify for complimentary guest registration. A Guest is a spouse, life partner or dependent who is not in the water or wastewater industry and who will not attend any educational sessions. The Annual Dinner and other ticketed events are not included. Ticket(s) must be purchased if a guest wishes to attend.

## College Students

Full-time college students may register at no charge if the registration form is submitted with a photocopy of current student identification. Social events and ticketed events are not included.

## Cancellation/Substitution Policy

No refunds granted after April 30th. A \$50 cancellation fee will be assessed on all refund requests received by April 30th. All refunds must be requested in writing. Substitutions are permitted with a \$25 per person substitution fee. Substitutions may be made until May 15th and must be made in writing, accompanied by a new registration form. Substitutions may not be made on-site.

## Badges

Upon arrival at the Conference, visit the PWEA Registration Desk to pick up your badge and other Conference materials. Everyone must have a badge to enter the Exhibit Hall, conference sessions, and food areas. Badges will be checked, so please wear your badge in a visible area at all times

## Wireless Internet Service

Wireless internet service will be available at no charge in the Exhibit Hall.

# EXHIBIT HALL

The Exhibit Hall is a very important part of the PennTec Conference. The exhibits will open on Monday at 7:30am and close on Tuesday at 5:30pm. Visiting the vendors will be informational, educational, and it will also be fun! Here are some of the things we have planned for you in the Exhibit Hall:

## Raffle Prizes

Four (4) prizes will be raffled at different times throughout the Conference. Attendees registered for the full conference will be given raffle tickets, and there will be marked containers placed randomly throughout the Exhibit Hall—one for each prize. Attendees may put as many of their tickets as they'd like in each marked container. Raffle tickets will be drawn in the Exhibit Hall on Monday during lunch and the President's Reception and on Tuesday during lunch and the Beer & Pretzels Reception. You must be present to win. Exhibitor representatives are not eligible for these drawings.

## President's Beer & Wings Reception

Be sure to attend the President's Reception on Monday, 4:30-5:30pm. Enjoy complimentary beer & wings while you network with your colleagues and the vendors.

## Beer & Pretzels Reception

We will be serving complimentary beer, root beer, and soft pretzels in the Exhibit Hall on Tuesday afternoon! Come to the Hall to relax and visit with the vendors.

## Skee Ball Tournament

A Skee Ball Tournament will be held in the Exhibit Hall on Monday and Tuesday. Each participant must visit the exhibitors to get tokens for play. Scores will be kept and high scorers will be announced at the Beer & Pretzels Break on Tuesday afternoon. Winners must be present to receive their prize—a "one of a kind" PennTec 2015 Skee Ball Tournament T-shirt.

## NEW! Scavenger Hunt

The PWEA Exhibits & Sponsors Committee is organizing a Scavenger Hunt in the Exhibit Hall on Monday and Tuesday. Attendees will be given instructions and a list of items to find by visiting the booths. High scores will be announced during the Beer & Pretzels Reception on Tuesday afternoon. Winners must be present to receive their prize.

## Conference Credit for Visiting the Exhibitors

You can earn PA DEP credit for visiting the vendors. To verify attendance and receive CE credit, your tracking sheet must be stamped by at least 50% of the vendors. Tracking sheets will be available in the Registration area.

# HOTEL ACCOMMODATIONS

**Lancaster Marriott at Penn Square**  
25 S. Queen Street • Lancaster, PA 17603

A block of rooms has been reserved at the Marriott for PennTec 2015. **Reservations must be made by May 9, 2015.** Rooms may not be available after this date. The discounted room rate is as follows:

\$139.00 per Room/Single or Double Occupancy *This rate includes overnight parking in the Penn Square Parking Garage only. Taxes and meals are not included. All rooms are non-smoking.*

Please call Reservations at 1-888-850-6146 and request the PWEA PennTec Conference room block to receive the discounted rate, or go to [www.lancastermarriott.com](http://www.lancastermarriott.com) and enter the Group Code **PTCPTCA** under Special Rates & Awards.

## Parking

Parking is available in several parking garages near the Lancaster Marriott. Anyone who books a sleeping room at the Marriott should park in the Penn Square Parking Garage located adjacent to the hotel. The parking fee is included with your room rate.

Those who are not staying at the Marriott are eligible for the discounted daily parking rate of \$7 plus tax (the regular rate is \$15 per day). This discount is only available for the Penn Square Garage and other Lancaster Parking Authority Garages in the area. Valet parking is not eligible for this discount.



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# 2014 Annual Business Meeting Minutes

President Arthur Auchenbach called the 86th Annual Business Meeting to order at 12:35 p.m. A quorum was established. President Auchenbach asked for discussion on or approval of the 2013 Annual Business Meeting minutes as submitted.

**MOTION/SECOND BY:** Larry Fair/Carl Janson

**MOTION:** To approve the minutes from the 2013 Annual Business Meeting as published in the 2013/2014 Annual Report

**RESULT:** Motion passed.

President Auchenbach thanked the conference exhibitors and sponsors for their continued support of the Association's Mission of providing quality training to water quality professionals.

First Vice-President Daniel Slagle thanked everyone in attendance for supporting the annual conference. The PWEA and Section joint meeting was well attended and included a good range of discussions.

Second Vice-President Brian Book reported he planned to work closely with the association's technical committees to solicit abstracts of value and to strengthen the technical program.

First Past President Charles Music had nothing to report.

Second Past President Joseph Drnach had nothing to report.

Secretary/Treasurer Larry Fair reported the PWEA ended fiscal year 2013 in solid financial condition.

Western Section Director Joseph Rost reported the Section had between 60-650 members. WESTEC 2014 was a successful event. Several workshops and plant tours were scheduled for October and November. The Section's President, Patrick Canavan, found it necessary to step down from his position due to medical reasons. Lisa Cortazzo was identified by the Section to fill the President's position through the remainder of 2014.

Central Section Director Erin Threet reported the Section's plant tours were successful; a golf outing was scheduled for August.

Eastern Section Director Tina Myers reported the Section had 1,262 members. Several workshops were planned for fall of 2014. The Section was working to support local community colleges.

First Federation Delegate Carl Janson reported WEFTEC.14 would be held in New Orleans starting September 27. The Association has presence at all of the WEFMAX regional leadership conferences in 2014.

Second Federation Delegate Dean Miller introduced Ralph Exton, the WEF Treasurer and member of PWEA. A report on the Water Environment Federation's Utility Partnership Program was provided.

Federation Delegate-at-Large Michael Kyle reported on WEF Board of Trustee and House activities. WEF is working to best match WEF representatives to a Member Association to provide added value to their annual conference.

PWO Director David Brown invited everyone to attend the Operation Challenge event and thanked the judges for their time and effort in making the event a success. The golf outing had good participation.

**MOTION/SECOND BY:** Charles Music/Joseph Rost

**MOTION:** To approve the Officer and Director reports.

**RESULT:** Motion passed.

Executive Director Susan Boynton asked everyone to refer to the Agenda for the 2014/2015 Board meeting schedule. Attendees were invited to view a map of PA wastewater systems without a certified operator on the Association's website. She had no other information to report.

## COMMITTEE REPORTS

All PWEA Committee reports submitted were included in the 2013/2014 Annual Report and were also published in the April/May/June 2014 issue of the *Keystone Water Quality Manager*.

**MOTION/SECOND BY:** Daniel Slagle/Michael Sassaman

**MOTION:** To approve the Administrative and Committee reports.

**RESULT:** Motion passed.

## UNFINISHED BUSINESS

There was no unfinished business.

## NEW BUSINESS

Nominations Committee Chairperson Carl Janson presented the names of nominees for PWEA Officers for the 2014/2015 term as published in the Annual Report section of the April/May/June 2014 issue of the *Keystone Water Quality Manager*. The following slate of names for 2014/2015 Officers was presented for approval:

President – Daniel Slagle

First Vice-President – Brian Book

Second Vice-President – Larry Fair

Secretary/Treasurer – Scot Fertich

Editor – Brian Lubenow

First Federation Delegate – Dean Miller

Second Federation Delegate – Carl Janson

**MOTION/SECOND BY:** Erin Threet/Edward Treat

**MOTION:** To accept the report of the Nominations Committee

**RESULT:** Motion passed.

President Auchenbach asked if there were any nominations from the floor. Hearing no nominations from the floor, President Auchenbach requested a motion to close the entire ballot and to cast a unanimous vote to accept the nominations as read by the Nominations Committee Chairperson.

**MOTION/SECOND BY:** Carl Janson/Michael Kyle

**MOTION:** To close the entire ballot for Officers and to cast a unanimous vote on all nominations presented by the Nominations Committee.

**RESULT:** Motion passed.

Having no additional New Business, President Auchenbach adjourned the 2014 Annual Business Meeting.

Respectfully submitted,

*Susan Boynton*

SUSAN BOYNTON, PWEA Executive Director



# 2014 Annual Committee Reports

## INDUSTRIAL WASTE PRETREATMENT COMMITTEE

One of the primary functions of the Industrial Waste Pretreatment Committee is to provide training for municipal wastewater staff, industrial representatives and consultants relative to the federally-mandated Industrial Pretreatment Program and associated topics. During 2014, the committee coordinated a full day session on June 3, 2014 at the PennTec annual conference in State College. All sessions were well attended.

In addition, the "Pretreatment Corner" column in the quarterly PWEA publication, *Keystone Water Quality Manager*, is written by members of this committee. The Industrial Waste Pretreatment Committee meets on a quarterly basis and selects nominees for the Industrial Waste Excellence Award and the Roy F. Weston Award and presents the nominations to the PWEA Awards committee each year for final decision. These awards are presented at the annual PennTec conference.

Respectfully submitted,

*Judy F. Musselman*  
**JUDY F. MUSSELMAN**  
Chair

*Mark Strahota*  
**MARK STRAHOTA**  
Vice-Chair

## IT/SOCIAL MEDIA COMMITTEE

With respect to IT activities, the website sub-committee has been working closely with Sue Boynton and our vendor on the development of the new website. We have selected Vieth Consulting to develop the new website and are looking forward to a successful release in late spring of 2015. Vieth Consulting has worked successfully with several other Water Environment Member Associations in developing their websites. We are confident that the new website will be more user-friendly and also contain information that is more up to date and easily accessible. In addition, the new website will be easier for staff and webmasters to update pages and information. We look forward to receiving any member comments or suggestions after their use of the new site.

Respectfully submitted,

*Carl E. Janson*  
**CARL E. JANSON**, IT Chair

## LABORATORY PRACTICES COMMITTEE

The PWEA Lab Practices Committee has been busy preparing for PennTec 2015. Over the last few months we developed a Laboratory Supervisor Course which was submitted to DEP for approval for 6 credit hours. It is now ready to be offered at PennTec this year in June. Additionally, we are planning to offer this course through the western section on March 13, and in September in Milton, PA. Please contact us for more information. We are looking forward to continuing to support lab personnel in our industry and always welcome new members to the committee. A special thanks to all of our current committee members who volunteer their time and talents.

Respectfully submitted,

*Larissa Hoover*  
**LARISSA HOOVER**  
Chair

*James Splenda*  
**JAMES SPLENDIA**  
Vice-Chair

## PROFESSIONAL WASTEWATER OPERATIONS (PWO) COMMITTEE

In 2014, the Professional Wastewater Operators (PWO) Committee remained active with events related to PennTec at State College. We started the conference with our Annual Golf Tournament, held at the beautiful Skytop Mountain Golf Club in nearby Port Matilda. The Western Section took the top honors, and the coveted "Crooked Putter" Award. The committee would like to thank all the Golf Hole Sponsors, and looks forward to working with them again in 2015!

At the PennTec Conference, several operator specialty workshops were organized by the PWO Committee. They included the Securing Drinking Water and Wastewater Treatment Facilities Course, and the DEP Activated Sludge Refresher Course. These were presented on Monday & Tuesday at the Conference. And the PWO Committee organized a plant tour at the Borough of Huntingdon WWTP.

The Committee is also responsible for administering the Operations Challenge, which prepares and determines which team or teams will represent Pennsylvania at WEFTEC. Last year, the "Unflushables" from the Philadelphia Water Department rehearsed at PennTec, but unfortunately were unable to make it to WEFTEC in New Orleans. We look forward to supporting them in 2015. The PWO Committee will continue to promote and encourage operators and utilities to consider participating in this rewarding and challenging activity.

We also hosted the Operators Olympics for all the participants at the Conference. These are easy and fun activities. The Plunger Toss and Turd Toss were big hits and provided a lot of laughs. A few, skilled (lucky) Olympians walked away with some great prizes, too!

The PWO committee is committed to assist the PaDEP and the PWEA in all aspects of operator development. Operator training, certification, education, and recruitment, are issues that are important to our industry and the PWEA. To that extent, we are always looking for individuals who are interested in fostering these objectives and serving our committee and organization.

I would like to thank the members of the committee for all of their time and service, which they so graciously offered for the advancement of our profession. We look forward to a successful year in 2015.

Respectfully submitted,

*David A. Brown*  
**DAVID A. BROWN**, Chair

# 2014 Annual Committee Reports

## RESEARCH COMMITTEE

The Research Committee is responsible for identifying and awarding eligible recipients in each of the following areas: wastewater treatment operator, environmental professional in the area of water/wastewater treatment, and student research projects also in the area of water/wastewater treatment. Eligible recipients are identified by active involvement in some type of research that helps to improve the overall industry.

In 2014, the Research Committee completed its charge with respect to award selection. Final selections for the student winners of the PENNTEC 2014 awards were made in February. There were five student presentations: **Mr. Hiroyuki Kashima** from Penn State – University Park (advisor Dr. Regan), **Mr. Andrew Kreider** from Penn State – University Park (advisor Dr. Brennan), **Ms. Juhí Parmar** from Penn State – Harrisburg (advisor Dr. Chen), **Ms. Jennifer Stager** from Penn State – University Park (advisor Dr. Logan), and **Mr. Maxwell Wallack** from Penn State – University Park (advisor Dr. Logan). These podium winners also presented posters of their research during the morning break. We also had five separate poster awards: **Mr. Leikune Aragaw** and **Ms. Emily McGonigle** from Lafayette College (advisor Dr. Kney), **Mr. Dan Cannistraci** from Lehigh University (advisor Dr. Jellison), **Ms. Emily Crossette** from Lafayette College (advisor Dr. Kney), **Mr. Daniel Gresh** and **Mr. Anthony Fraccica** from Elizabethtown College (advisor Dr. Read-Daily), and **Ms. Krista Liguori** from Penn State – University Park (advisor Dr. Velegol). Our overall student winner was Mr. Hiroyuki Kashima for his presentation entitled “Facultative Nitrate Reduction by Electrode-Respiring Biofilms in a Bioelectrochemical System.” The Research Committee supported his attendance at WEFTEC, where he represented PWEA well by winning first place in the 2014 Water Environment Federation Student Paper Competition in the Graduate Division. This was back-to-back first place awards for PWEA students at the national level. This year’s operator research award winner was **Mr. George Myers** from Milton Regional Sewer Authority. There was no professional research award winner in 2014.

Abstracts for the student awards this year (2015) have been received and are under review. The Research Session at PENNTEC will again be on Tuesday morning, with posters attended during the lunch break.

### Committee Members:

Rachel Brennan, Penn State University  
John Davis, Widener University  
Holly Frederick, Wilkes University  
Mark Garlicki, Gannett Fleming  
Kevin Gilmore, Bucknell University  
Deborah Hoag, City of Reading  
Albert Horng, Hatfield Township Municipal Authority  
Kristen Jellison, Lehigh University  
Arthur Kney, Lafayette College  
Larry Li, Brentwood Industries  
Edmond McCorkle, Bursich Associates  
Dean Minnich, Nazareth Borough Municipal Authority  
Vikram Pattarkine, PEACE USA  
Vijay Rajput, Lower Bucks County Joint Municipal Authority  
Brenda Read-Daily, Elizabethtown College  
Jay Regan, Penn State (chair)  
Robert Sheker, Envirodyne Systems

Respectfully submitted,

*John (Jay) Regan*  
**JOHN (JAY) REGAN**, Ph.D.

## STORMWATER COMMITTEE

Established in August 2012, the Stormwater Committee is responsible for technical sessions at the annual PennTec Conference, specialty workshops on current stormwater-related topics, preparing position statements as requested and contributing articles for publication in the KWQM.

Last year, the committee prepared and organized a full day of stormwater sessions for PennTec 2014. Both morning and afternoon sessions were well attended and well received. The committee also planned and hosted its first workshop in September 2014 entitled “Stormwater Partnerships & Authorities Fall Workshop.” The workshop highlighted current information and case studies from local, regional and nationwide perspectives. Check out the full summary article in this issue. Additionally, a position statement on 21st Century Stormwater Management has been provided to the PWEA Board of Directors to review and to ultimately publish. The committee has monthly conference calls to coordinate these activities and stay up-to-date on current stormwater issues.

For 2015, the committee has reviewed abstracts and prepared another full day of stormwater sessions for the annual PennTec conference. As illustrated in this publication, the committee assisted the Editorial Committee in compiling a specialty issue focused on current issues in stormwater management. Special thanks to Jeff Cantwell who sits on both committees and led the effort.

### Active members of the committee include:

Vincent Wayne, Buchart Horn, Vice-Chair  
Beth Dutton, 3 Rivers Wet Weather  
Charlotte Katzenmoyer, City of Lancaster  
Deborah Healey-Langley, Hazen and Sawyer  
Hans DeBruijn, Fresh Creek Technologies  
Jeff Cantwell, Flow Assessment  
Jeremy Miller, Hampden Township  
Michael Schober, CDM Smith  
Nathan Walker, AMEC Foster Wheeler  
Rhonda Zellhart, Cranberry Township  
Roy Rudolph, GHD  
Russell Benner, T&M Associates

The Stormwater Committee would especially like to thank Charlotte Katzenmoyer for volunteering her time to speak at the fall workshop and at PennTec technical sessions year after year and for her leadership at the City of Lancaster, which is setting an example for other municipalities to follow on how to successfully manage stormwater for the betterment of a community.

Respectfully submitted,

*Jared C. Hockenberry*  
**JARED C. HOCKENBERRY**, Chair

# 2014 Annual Committee Reports

## STUDENTS AND YOUNG PROFESSIONALS COMMITTEE

This year has been a busy year for the committee. Below is a list of items that were accomplished this year:

1. **Southeast Pa Technical Seminar and Networking Event**  
– June 2014: PWEA and PaAWWA sponsored a joint technical seminar and networking event at the Field House Sports & Beer Hall in Philadelphia. The event lasted for approximately four and a half hours and included topics related to collection systems and water distribution systems. A networking event followed the technical seminars. Approximately 25 people attended the event from various factions of the water/wastewater field.
2. **Northcentral Pa Plant Tour and Networking Event** –  
September 2014: PWEA and PaAWWA sponsored a joint wastewater treatment plant tour and networking event. At the Williamsport Municipal Authority's Central Wastewater Treatment Plant. The event began with a tour of the recently upgraded facility. After the tour, facility managers gave a presentation on the history of the plant and the construction process. After the tour and seminar, a networking event was held. Approximately 20 people attended the event from including consultants, operators, and vendors.
3. **PennTec 2014**
  - a. Are You Smarter Than a YP Social Event – The Committee hosted its annual social event at PennTec. For the first time in several years, a new champion was crowned. The new champions successfully knocked off a group of seasoned professionals that have proven to be difficult to beat in previous years.
  - b. Technical Seminar – The committee sponsored a technical seminar examining the construction process from various viewpoints, including that of an engineer and an operator/superintendent.
4. **Food Drive** – The committee sponsored a statewide food drive to benefit food banks local to each participating member. Overall, 535 pounds of food was donated throughout the state.
5. **Conference Calls:**
  - a. Numerous conference calls were held over the course of the year.
  - b. The Committee, in conjunction with various other committees, has determined that securing new members and retention of existing young members is a top priority.
  - c. We began to develop a list of colleges and universities that offer environmental science and related degrees. We also were able to divvy up the list and began filling in contact information for each college.
  - d. Job Fair – Towards the end of the year, we were hard at work planning the first ever Career Fair to be held during PennTec 2015. We held conference calls with the Chesapeake Chapter of WEF. They were able to provide us insight into past career fairs they have held, as well as what has worked and what has not.

Respectfully submitted,

*Chase Kelch*  
**CHASE KELCH**  
Chair

*Steven Kestel*  
**STEVEN KESTEL**  
Vice-Chair

## TRAINING COMMITTEE

The Training Committee provides assistance to PWEA technical committees with planning and organizing specialty conferences and workshops.

In order to be approved for continuing education credits, a course undergoes a rigorous review and must meet a high standard for adult education. The Training Committee will guide the technical committees as they develop their courses. For example, we will assist in preparing the course outline, a lesson plan and incorporating the student assessment. Once a course is developed, we upload the course application into the DEP website. We will then work with both DEP and the technical committee on all issues until the course is approved.

In 2014, we have worked with several committees. The Laboratory Practices Committee received DEP approval for their "Fecal Forum II – Colilert-18 Method" course, in January, and their Laboratory Supervisor Training course was, also, just approved. PWEA has received approval for the DEP's "Introduction to Wastewater", "Drinking Water – General Overview", and "Distributions Systems" courses. The Collection Systems Committee had their "Fats, Oil, and Grease" course approved. The Training Committee also works with the Planning Committee to insure the Annual Conference qualifies as continuing education for both operators and engineers.

The Training Committee does offer our own training. At PennTec, they included "Three Hour Energy – The Math Behind the Savings", and "Troubleshooting Your Activated Sludge Process" courses.

And, the Committee continues to work on two initiatives from last year. We are updating and maintaining an Association Training Calendar. It is a running three-year calendar that will help our committees plan and coordinate their training efforts. And, we are working with the committees to insure we can repeat our many workshops by updating and maintaining our electronic library of all of the course materials, in the association office.

We hope you take advantage of all of the continuing education available through the association. The technical committees are uniquely qualified to provide you with the most up to date information. We are proud to be able to support them in their efforts.

I would like to thank the committee members for their time and effort, as we strive to provide continuing education and training opportunities for all the members of the water and wastewater profession.

Respectfully submitted,

*David A. Brown*  
**DAVID A. BROWN**, Chair



# 2014 Annual Committee Reports

## WATER SUSTAINABILITY AND REUSE COMMITTEE

The main objectives of the Water Sustainability and Reuse Committee are to:

- Raise awareness of the importance and relevance of water reuse in Pennsylvania.
- Identify and describe water reuse technologies and techniques that are applicable to a "water-rich" location such as Pennsylvania.
- Examine the pitfalls and obstacles, technological, economic, or otherwise, that will need to be overcome as water reuse becomes a fully recognized tool in the wastewater/water supply/water resource toolbox.
- Educate PWEA members on PADEP guidelines, LEED, and other emerging trends as they apply to water reuse.

The committee, which was re-activated in the summer of 2006, sponsored and implemented a full-day session at PennTec 2014, at which six presentations were given. The presentations included:

- Lagoon Latency – Submerged fixed-film media improves wet-weather lagoon nitrification – Nutrient Removal Technology,
- Produced water reuse with reverse osmosis
- Water reuse in snowmaking
- Electrification & cogeneration at the North River WWTP, NYC
- Water reclamation in an arid environment from uranium processing wastewater
- PWD channel mixing energy savings

### Active members of the committee as of this writing are:

Obed Addo, City of Philadelphia Water Dept.  
Brian Book, Former Co-Chair, Hazen and Sawyer  
Michele Braas, Rettew Associates, Inc.  
Brian Brady, Greeley and Hansen, LLC  
Paul Brezovec, Concurrent Technologies Corporation  
Tony Elberti, Co-Chair, Gannett Fleming, Inc.  
Mikel Goldblatt, Solenis  
Andrew Hood, Keystone Engineering Group, Inc.  
Mark Malarich, Gannett Fleming, Inc.  
Kevin McLeary, PADEP  
Lucinda Pype, Co-Chair, CDM Smith  
Edward Spayd, Herbert, Rowland & Grubic, Inc.  
Julianne Stile, United Water  
Chris Underwood, Rettew Associates, Inc.  
Nathan Walker, AMEC Foster Wheeler  
Ivan Zhu, ITT Water and Wastewater Leopold Inc.

Respectfully submitted,

*Lucinda J Pype*  
**LUCINDA J PYPE**  
Chair

*Tony Elberti*  
**TONY ELBERTI**  
Vice-Chair

## UTILITY MANAGEMENT COMMITTEE

The Utility Management Committee is charged with enhancing utility management through education, networking, and professional certification.

In 2014, the committee continued its series of articles in the *Keystone Water Quality Manager* on the "Ten Attributes of an Effectively Managed Utility", and in 2015 plans to do a series of articles on "The Five Keys to Management Success".

The committee again developed and sponsored a full day of technical sessions and a workshop at the 2014 PennTec which included the following:

- "Lehigh County Authority Manages Knowledge for Future Successes" – Brad Jurkovic, GHD Inc.
- "Climbing the Ladder - Are You Promotable?" – Phil Tiewater, Delcora
- "Managing the Human and Physical Assets – How to Get-r-done" – Gary Vaughan, Greeley and Hansen
- "Capital Projects Start to Finish" – Scot Fertich, Lancaster Area Sewer Authority
- Integrated Project Delivery – What's the Buzz, and How It Can Benefit Municipal Owners? – Rich Atoulikian, HDR Engineering, Inc.
- "Achieving Net Zero Energy via Public Private Partnerships – the Village of Ridgewood NJ Story" – Richard Cisterna, Natural Systems Utilities
- SOP Workshop – Tammie Myers, Century Engineers

The committee also authored a PWEA Position Statement on "Financial Sustainability for Wastewater Infrastructure" and recently completed one on "Renewable Energy Generation from Wastewater".

Finally, the committee is working to develop an individual PWEA award entitled "Utility Leadership Excellence Award" that we hope can be awarded for the first time at the 2016 PennTec.

We would like to thank all the members of the committee this year for their participation and hard work, and look forward to a successful 2015.

Respectfully submitted,

*Mike Kyle*  
**MIKE KYLE**  
Chair

*Mark Pickering*  
**MARK PICKERING**  
Vice-Chair

# 2014 Annual Budget

REVENUE	2014 BUDGET	2014 ACTUAL
Membership Dues	81,275.00	73,575.00
Magazine Advertising	39,350.00	51,330.00
Annual Conference	277,750.00	259,088.00
Training Events	32,300.00	45,785.00
Other	23,990.00	35,058.00
<b>TOTAL REVENUE</b>	<b>454,665.00</b>	<b>464,836.00</b>

EXPENSES	2014 BUDGET	2014 ACTUAL
Administrative Mgmt Services	85,075.00	85,525.00
Website Mgmt Services	3,000.00	3,487.00
Graphic Design Services, Gen'l	250.00	28.00
Travel Expenses (Staff)	5,500.00	4,949.00
Leadership Travel/ Meeting Expenses	12,000.00	13,498.00
Bank Service Fees	100.00	33.00
Credit Card Service Fees	7,500.00	7,267.00
UBIT Expenses	2,200.00	1,890.00
Accountant Services	4,050.00	3,670.00
Database/Internet/ Communications Support	7,500.00	4,726.00
Legal Services	1,000.00	0.00
Supplies	3,500.00	3,170.00
Telephone	1,850.00	1,971.00
Postage	2,000.00	1,693.00
Printing Services	0.00	0.00
Dues and Subscriptions	500.00	195.00
Insurances	2,000.00	1,711.00
Miscellaneous	3,500.00	2,305.00
Donations/Contributions	3,000.00	3,000.00
Magazine	32,015.00	47,505.00
Annual Conference	217,875.00	199,880.00
Operations Challenge Program	6,000.00	352.00
Training Events	13,200.00	21,756.00
WEF membership dues (collected thru PWEA)	4,200.00	3,417.00
Website Hosting	1,200.00	1,068.00
Equipment Purchases	0.00	0.00
PWEA Pins	1,000.00	1,063.00
PWEA Reception at WEFTEC	9,000.00	14,577.00
Redesign of Website	9,500.00	5,307.00
Golden Plunger Award/ Section Scholarship	250.00	250.00
Membership Recruitment	0.00	0.00
PWEA Contribution to Section Scholarship Program	3,000.00	3,000.00
Young Professional Programs	1,000.00	716.00
Stockholm Water Prize	700.00	150.00
PWEA Committees	10,000.00	6,133.00
Student Research Paper at WEFTEC	1,200.00	1,217.00
<b>TOTAL EXPENSES</b>	<b>454,665.00</b>	<b>445,509.00</b>
<b>REVENUE OVER EXPENSES</b>	<b>0.00</b>	<b>19,327.00</b>

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# Pennsylvania Water Environment Association

## Job Bank

The **Job Bank** provides a targeted, economical, and time-responsive service connecting water quality professionals with current employment opportunities. The Job Bank is distributed to members on the first business day of each month by email; employment positions are posted online for viewing as soon as ad is received with payment. Persons searching for a new career and employers seeking qualified candidates are encouraged to participate in this program.

Ads need be submitted along with payment by check or credit card to the PWEA office **by the 25th of the month** in order for the ad to be issued in the following month's Job Bank distribution. Prices indicated are **per ad** and are for a one-time distribution and posting of your organization's ad. **Your ad in WORD format should be emailed to [pwea@pwea.org](mailto:pwea@pwea.org).** Ads to sell personal property will not be accepted. Ads are restricted to non-commercial purposes. The Pennsylvania Water Environment Association reserves the right to reject ads it deems unsuitable.

**Questions? Call 717-642-9500**

AD LENGTH	EMPLOYER <b>MEMBER</b> RATE (Employer has at least one employee who is a member of PWEA)	EMPLOYER <b>NON-MEMBER</b> RATE (Employer has no employee who is a member of PWEA)	JOB CANDIDATE (PWEA <b>Member</b> )	JOB CANDIDATE ( <b>Non-Member</b> )
50 words or less	\$35	\$100	Complimentary	\$20
51-100 words	\$70	\$135	\$10	\$40
101-150 words	\$105	\$170	\$20	\$60
151-200 words	\$140	\$205	\$30	\$80
201-250 words	\$175	\$240	\$40	\$100
251-300 words	\$210	\$275	\$50	\$120

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Contact name for questions about ad: \_\_\_\_\_

Phone: \_\_\_\_\_ Email address: \_\_\_\_\_

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**Email** this form, ad insertion and payment to: [pwea@pwea.org](mailto:pwea@pwea.org)

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## Safety Quiz

- 1 A: Every year
- 2 D: Every 10 years
- 3 A: At work
- 4 D: Both A & B
- 5 D: Never



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## Whiz Quiz Answers

### Pumps and Hydraulics

- 1 A: True
- 2 B: Cavitation
- 3 D: Head
- 4 A: Flumes and weirs
- 5 A: True
- 6 C: 467



A wet well is 12 ft. long and 10 ft. wide.  
The influent valve to the wet well is closed.  
If a pump lowers the water level 2.6 ft.  
during a 5 min pumping test, what is the  
gpm pump rating?

$$\frac{(12 \text{ ft.}) (10 \text{ ft.}) (2.6 \text{ ft.}) (7.48 \text{ gal/cu ft.})}{5 \text{ min}} = 467 \text{ gpm}$$

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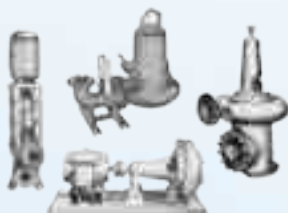
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