

Pacific Northwest Clean Water Association

# PNCWA

Newsletter  
Spring 2010



## SCHOLARSHIP APPLICATIONS

Scholarship Program  
deadlines

## FEATURE FOCUS: WATER REUSE

Starts on page 17

## PNCWA WEBINARS

Plant Operations &  
Maintenance Committee;  
Safety Committee





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PNCWA PHOTO



**Operations at the City of**

**Caldwell, ID:** Left to Right: Jim Bell - Operations/Collections Supervisor (Retiring May 31, 2010); John Shawcroft- Asst. Project Manager & PNCWA President; Joe Paulin - Maintenance Supervisor; Sandra Thweatt - Administrative Asst.; Tammy Justus - Industrial Pretreatment Program Coordinator; Randy Bassine - Collections Operator; Gilbert Sanchez - Project Manager; Chris Johnson - Collections Operator; Gilbert Flores - Maintenance & SWIOS President Elect; Kerry Johnson - Operator & Lab Technician. Not Shown: William Matney - Operator/ Laboratory & Safety Coordinator; Bruce Butler - Operator & Biosolids Coordinator; Patti Smith - Truck Driver; Farron Rice - Truck Driver.

PNCWA is made up of people doing a great job. Want to see your organization's great people on this page? A member may email their high resolution photo to [mikerainey@pncwa.org](mailto:mikerainey@pncwa.org), listing individuals' names, titles, and the date and location of the photo. Contact the PNCWA office for assistance.

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COVER PHOTO: THE OREGON GARDEN, SILVERTON, OR ([WWW.OREGONGARDEN.ORG](http://WWW.OREGONGARDEN.ORG))

**MISSION STATEMENT**

Pacific Northwest Clean Water Association (PNCWA) is dedicated to preserving and enhancing the water quality in the states of Idaho, Oregon, and Washington. We promote the technical development of our members, the dissemination of information to the public and the advancement of science needed to protect the water environment.

**VISION STATEMENT**

Pacific Northwest Clean Water Association will be the recognized leader throughout Idaho, Oregon, and Washington for ensuring clean water for future generations.

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## PNCWA NEWSLETTER

To contribute an article, contact Sheri Wantland, 503.681.5111 or [wantlands@cleanwaterservices.org](mailto:wantlands@cleanwaterservices.org). Newsletter articles reflect the author's opinions and not necessarily those of the PNCWA Board of Directors or Water Environment Federation. The PNCWA newsletter is published quarterly, © 2010 Pacific Northwest Clean Water Association. Change of address inquiries should be directed to the PNCWA office.

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Two important things to note in our recent history; a new newsletter format and the successful Oregon Operator Conference in Grande Ronde, Oregon last November; both very noteworthy events.

First the new newsletter format. I feel very privileged to be the last PNCWA President to appear in the old newsletter format and the first President of PNCWA to appear in the new format. Many people have contributed their time and talents to make this change a reality. Newsletter editor Sheri Wantland frequently has been a one-woman show, putting our newsletter together without a lot of help in years past. She has worked diligently, and often thanklessly, as the only member of the Newsletter Committee. Now, we are forming an Editorial Advisory Group to help guide the content of our publication and have a brand new look to our favorite publication. Congratulations to all those who made this possible.

The First Oregon Operator Conference was a huge success. I was very pleased to see it become a reality, having attended the First Idaho Operator Conference 28 years ago. The Oregon Sections put together an outstanding event, and Conference Chair Max Hildebrand did himself and our profession proud. I had the honor of speaking at the event and greatly enjoyed my time there. Max and the entire Region deserve special recognition for this hugely successful endeavor. Congratulations to Max, the Sections, the sponsors, and all the trainers.



PNCWA President  
John Shawcroft  
Veolia Water NA

Preparations for the upcoming annual conference in Bend, Oregon are progressing splendidly. PNCWA is blessed to have talented and dedicated people working on the event, and I thank each for their participation: Conference Chair Susanna Leung, Carollo Engineers; Program Chair Dan Laffitte, Brown & Caldwell; Preconference Workshop Chair Doug Berschauer, CH2M HILL; Incoming Manufacturers & Representatives Committee Chair Joe Kernkamp, APSCO; Operations Challenge Chair Preston Van Meter, Kennedy/Jenks Consultants; PNCWA Treasurer Shannon

*Continued on page 11*

## GE Water & Process Technologies

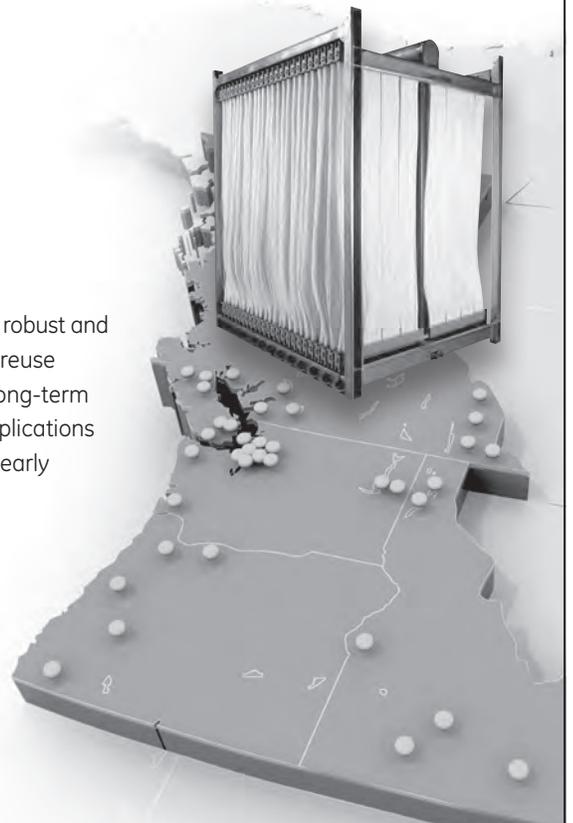
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## Deadline related content in this issue

- Pub Ed Communications Camp Workshop, April 9, see page 34
- Applications for PNCWA Scholarships, May 1, see page 13
- Safety Webinar, May 6, see page 24
- POM Webinars, April 22 and May 20, see page 25
- PNCWA Awards nominations July 1, see page 28
- PNCWA Annual Conference Oct. 24-27, see page 7

# Focus on Water Reuse

By Daniel Ayers, PNCWA Water Reuse Committee Chair

Reuse is becoming more and more prevalent in the wastewater management industry, and is also becoming more noticed by the general public. We have a resource that is quickly being recognized as a beneficial commodity, and the innovative ways wastewater is being treated and reused is being noticed, too. Two articles in this issue highlight ways in which wastewater is being used beneficially in wetlands applications to provide harvestable crops and improve water quality. **The Oregon Garden SPROut wetlands** and the **Talking Water Gardens projects** are both innovative wastewater projects the public, elected officials, and industry should know more about.

With the increased publicity, wastewater professionals must learn how to interact with the public, and two articles in this issue may help with this interaction. First, a **survey of the citizens of Corvallis** gives valuable insight into public thought on wastewater reuse. Second, a **paper on the detection of trace concentrations of contaminants** and how to communicate such a technical subject to the public. The PNCWA Water Reuse Committee hopes you enjoy the focus of this issue on wastewater reuse.

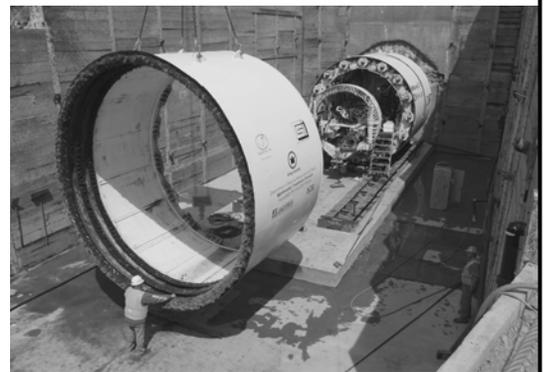
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# PNCWA 2010

## Building Professional Excellence in Water Quality

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Plans are underway for another four days of top-notch training providing the latest industry information all under one roof in beautiful Bend, Oregon during the PNCWA 2010 Annual Conference. The full technical program schedule will be online by May 1 and registration will be open in June.

Nestled along the banks of the beautiful Deschutes River, The Riverhouse Hotel offers spacious hotel guest rooms, an award winning steakhouse, a comfortable lounge for relaxing after a long day, and a pedestrian only bridge crossing the river delivering people directly to the state-of-the-art, LEED certified Riverhouse Convention Center located along the 18-hole Championship Golf Course - River's Edge. Refer to [www.pncwa.org](http://www.pncwa.org) for the latest information on the 2010 conference including special lodging rates and registration costs.

Bend is nearly the geographic center of the state and with a population of over 77,780 is the most populated city in Central Oregon. Bend, county seat of Deschutes County, covers 32 square miles. Tucked neatly between the snow covered peaks of the Cascade Mountains and the inspiring high-desert plateaus of Central

Oregon, Bend (originally called Farewell Bend) has evolved from a sleepy lumber town to an international mecca for outdoor enthusiasts and people in search of active and healthy year-round living and vacation experiences. The city is noted for its scenic setting, mild climate, year-round recreation opportunities and growing economy. At an elevation of 3,625 feet, Bend enjoys the predominately dry climate of the Great Basin. Sunny days, cool nights and low humidity characterize the weather.

Whether you're seeking the world renowned rock climbing at Smith Rock, the hiking, biking and skiing in the Cascade Mountains, the blue-ribbon fly fishing on the myriad of area trout streams, golfing with a mountain view in what has been referred to as "The Palm Springs of the North," the trail-running on Bend's cutting-edge Urban Trail System, or simply enjoying the vibrant energy of a hip cosmopolitan mountain town, people from around the world visit Bend to get outside and to be inspired by the Bend lifestyle.

Go to [www.visitbend.com](http://www.visitbend.com) to see what area attractions best suit your interests and join us in enjoying Bend in the fall.



RIVER'S EDGE GOLF COURSE/RIVERHOUSE



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## Agreement is Sometimes Hard

By Bill Bertera, Executive Director,  
Water Environment Federation

The argument for a single voice for water in North America is compelling...and in the eye of some, obvious. What is not so obvious is why achieving such a seemingly simple unanimity of purpose, which is so clearly in the public interest, is still the topic of debate rather than implementation. The answer is uncomfortable because it is simple, plain and unadulterated; it is "self interest".

Self interest in and of itself is not a bad thing. It is anything but. When applied in a broader context of a "public interest", however, the idea of self interest can become disorienting. And that is a shame because there are self interests that are public regarding, that are good self interests, i.e., that are consistent with and supportive of public policies that serve the greater good and which are in the public interest. For example, we give up certain



privileges or freedoms or short term benefits to have safe streets, or a clean environment or to have universal public education.

"Giving up"...that is a key phrase and a bit harsh and off-putting. It raises instant defenses and makes it difficult to see beyond the immediate. It causes us to put our personal and short term interests in the fore, to close off discussion. Looked at in another way, "giving up" suggests a hard, accusatory, winners vs. losers edge. It implies loss rather than gain, and while it often suggests special interests rather than public interests, the two are not mutually exclusive.

In the early days of the one voice for water conversation, the term was often interpreted solely as a call for a merger between WEF and the American Water Works Association... not a bad idea, but politically toxic in some quarters. It is unfortunate that the term acquired that narrow definition, because it was intended then as something much more and has become something much more in the years since.

Michael Read, a former president of WEF and now a public utility manager, first used the term to suggest the need for coming together within the water community and to come together on behalf of a public interest that far transcended the unimportant conflicts between two national organizations.

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**Can we find a way to speak with a single, authoritative and unambiguous voice?**

That public interest was defined in terms of a protected environment, a strong program of public health, and a vision of a future that was sustainable. Michael wasn't just talking about WEF and AWWA, nor about the public and private sectors; not urban and rural, not small systems and centralized systems, and not even just drinking water and what we used to call wastewater...but the WHOLE of the water community.

All of this comes to mind yet again as a number of Member Associations, most recently the British Columbia Water and Waste Association, call for increased collaboration within the water community. All speak to the issue of a single voice for water in North America and do so intelligently and cogently. But talking about collaboration in the public interest and doing it are not the same. Achieving it, especially at a national level, will take something more, and so far, we have shied away from that something more because that something more is painful.

To date the industry discussion about creating a single voice for water has been about doing so without anything changing...for us, for our association, company or utility. If there is to be change,

it is to take place somewhere else... by someone else...by you, in your association, company or utility. This is not a recipe for success; it is a recipe for inaction, for doing nothing while pretending to be willing to do anything. It is everyone deciding not to lead.

Negotiation is about compromise and this ball called "one voice for water" is not going to go down the field without good faith negotiation. Compromise sometimes requires "leaving something on the table" on behalf of a greater good. The greater good in this case is a water community that enjoys the kind of public respect that translates into public influence on the key water and environmental policy issues of the day...at all levels of government. The question before us is not whether to kick the ball, but who is going to kick it first and in what direction.

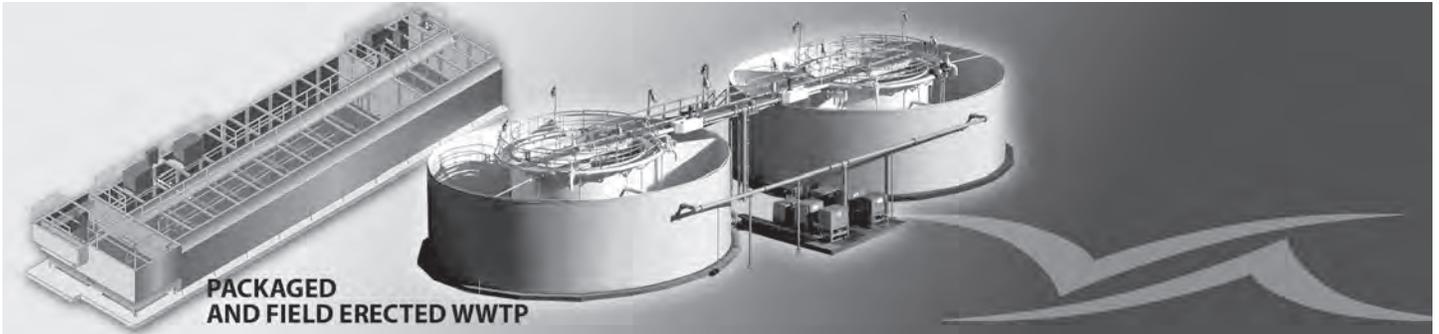
*Bill Bertera, Executive Director of the Water Environment Federation, may be reached at [WBertera@wef.org](mailto:WBertera@wef.org). J. Michael Read is a member of PNCWA, a Past PNCWA President and a Past WEF President. He may be reached at [jmread@olsd.net](mailto:jmread@olsd.net).*

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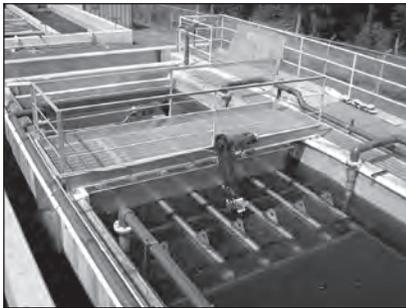
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## On the Move



Haley  
Falconer

### Haley Falconer joins HDR

Haley Falconer is a water/wastewater project engineer in Boise, responsible for reports, permit applications, evaluating design options and recommendations, and analysis and study-level reports for water and wastewater treatment distribution and collection systems. She holds a Master's in environmental engineering from Washington State University and is active in the WEF Students and Young Professionals Committee and serves as the SYPC Service Project chair. (See the article on page 23.)



Darold Woodward

### Darold Woodward moves to Parametrix

Darold Woodward, PE, is a senior electrical engineer in the Sumner office who will focus on electrical, controls and SCADA for water/wastewater design projects, and be involved in the development of projects that increase the sustainability of client operations and facilities. Woodward has 20 years of experience including extensive experience teaching automation technology and writing technical documentation including instruction manuals, product specifications, and training manuals.

*Information about PNCWA members is welcome. Send an email with "On the Move" in the subject line to [wantlands@cleanwaterservices.org](mailto:wantlands@cleanwaterservices.org)*

## What's a "kid" from Idaho doing feeding wallabies in Australia?



Catherine Chertudi enjoyed her APWA study fellowship in Australia.

Wallabies, water and walk-abouts are part of the large continent of Australia and Catherine Chertudi, Environmental Programs Manager with Boise City Public Works Department experienced it all in September 2009. Catherine received the American Public Works Association (APWA) Jennings-Randolph International Study Fellowship to research drought and water management issues in southern Australia. The fellowship provides a stipend for travel and requires the recipient to prepare a paper and presentation for an APWA conference and journal. Catherine visited a number of communities, both rural and urban in the Melbourne and Adelaide areas to study the effects of more than 10 years drought and the innovations in water reuse and conservation being implemented across the region. She was also selected to present a paper on western U. S. water management issues at the International Public Works Conference in Melbourne.

### FROM THE PRESIDENT

*Continued from page 3*

Taylor, City of Redmond, OR; South Central Operators Section President Bill Strait, City of Redmond OR; Manufacturers & Representatives Committee Chair Doug Allie, Goble Sampson Associates; Scott Thompson, City of Bend; and, PNCWA staff Nan Cluss and Michael Rainey. Bend is a beautiful venue with plenty of things to do, and you will not want to miss this conference.

Upcoming events include the Annual Idaho Operators Conference in Boise on May 23 – 26, an excellent opportunity to get your CEUs and network with your peers.

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Adam Zabinski, WEF Past President, presents the Eddy Wastewater Principles and Processes Medal to Dr. Remy Newcombe at WEFTEC®.09 in Orlando last October.

## Local Water Quality Professionals Received Prestigious WEF Water Quality Award

Dr. Remembrance Newcombe, Rebecca Rule, Dr. Brian Hart, Dr. Gregory Moller, Dr. Daniel Strawn, Tracy Grant, and Dr. Susan Childers received the prestigious Eddy Wastewater Principles and Processes Medal from the Water Environment Federation at WEFTEC®.09 in Orlando last October.

The Eddy Medal honors Harrison Prescott Eddy, a prominent engineer and a pioneer in the field of wastewater treatment. The medal is awarded for research that makes a vital contribution to the existing knowledge of the fundamental principles or process of wastewater treatment, as comprehensively described and published in a WEF periodical.

The authors were recognized for two separate articles published in the March 2008 issue Water Environment Research (WER). Newcombe, Rule, Hart and Moller wrote the first article, "Phosphorus Removal from Municipal Wastewater by Hydrous Ferric Oxide Reactive Filtration and Coupled Chemically Enhanced Secondary Treatment: Part I – Performance." Newcombe, Strawn, Grant, Childers, and Moller wrote the second article, "Phosphorus Removal from Municipal Wastewater by Hydrous Ferric Oxide Reactive Filtration and Coupled Chemically Enhanced Secondary Treatment: Part II – Mechanism." In both articles, the group demonstrated that using hydrous ferric oxide with a chemically enhanced secondary is a viable method for achieving very low levels of phosphorus in treated wastewater. A novel process for removing phosphorus from wastewater to low microgram/L levels was introduced including an extensive full-scale process performance evaluation and an original laboratory verification of a proposed phosphorus removal mechanism by sorption. The process is commercialized by Blue Water Technologies, Inc., where Dr. Newcombe is Chief Technology Officer.



# Green at Work

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Brown and Caldwell is applying the latest advances in sustainable design and business strategies to our projects, including the design and implementation of water reuse and filtration programs, sustainable biosolids management programs, and integrated energy solutions using renewable biogas for power generation and plant-wide power independence.

Brown and Caldwell has also made a commitment to change the way we do business in our offices; that's why we created BC Green, an internally-focused initiative that encourages sustainable practices in all that we do.



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# PNCWA 2010 Environmental Stewardship Scholarship Applications due May 1

*PNCWA's Board has put their full support behind development of a scholarship program to build and support our profession. These new scholarships will help key two-year, four-year, and post-graduate students make careers in the wastewater field a reality.*

The new PNCWA Scholarship Program that was rolled out in December is accepting applications for the first scholarship to be awarded. One \$1,500 scholarship is available for an immediate family member of PNCWA Members or a WEF/PNCWA Student. Completed applications need to be postmarked no later than May 1, 2010. Award will be announced by May 30, 2010.

The overall scholarship program objective is to encourage and support educational studies in the area of water quality, providing incentive for highly capable individuals to prepare for careers in the field of Water Quality Control and Environmental Protection.

*PNCWA is a 501 (c) 3 non-profit organization. Donations to the PNCWA Scholarship Fund are fully tax deductible. Scholarship donor recognition (both individual and corporate) will be published in the PNCWA newsletter and highlighted at the PNCWA Annual Conference.*

For information on award criteria and the application for 2010 or to make a donation, go to the Scholarship tab on the left-hand navigation bar at [www.pncwa.org](http://www.pncwa.org).

In addition to targeted funds from the PNCWA 2009 and 2010 budgets, thanks to donors listed at right for being the leaders in support of this valuable program.

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# Corrosive Deterioration of Two Critical Sewer Force Mains

By  
Susan M. Gierga

Clean Water Services personnel knew they had a problem when they discovered components of the twin 24-inch force mains were showing significant signs of deterioration. The immediate symptoms were corrosion making air release isolation valves inoperable and pinholes in nipple connections (See photo). To address the problems, they decided to perform a corrosion prevention and protection project.

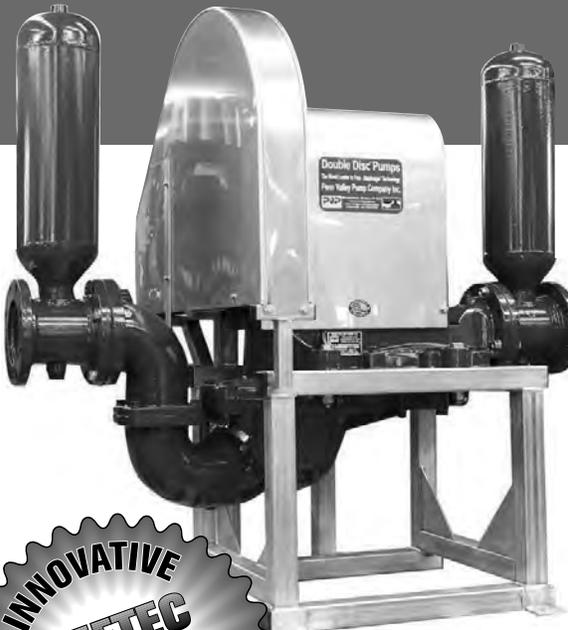
The twin force mains constructed in 1993 are approximately 46,000 feet long. Two 24-inch diameter sewers connect the Forest Grove and Hillsboro Wastewater Treatment Facilities with the Rock Creek Advanced Wastewater Treatment Facility. The force mains consist primarily of polyvinyl chloride (PVC) pipe. The mains transition to ductile iron (DI) at three major creek crossings. Where changes in pipe direction require bends or tees, DI fittings are used with the PVC pipe.

Twenty eight air release (ARV)/vacuum relief vaults are located at high points along the alignment, mounted directly to the PVC pipeline

with service saddles, pipe, fittings, and isolation valves made of various metal materials.

Murray, Smith & Associates, Inc. (MSA), in conjunction with Cascade Corrosion Consulting Services, Inc. (CCCS), conducted field investigations which included a visual inspection of vaults, valves, pipe, fittings, and accessible portions of the force mains. Also, measurements of soil resistivity at the vaults and along the pipeline were taken. It was clear that the many dissimilar metals, moist conditions at the vaults and the soil conditions were promoting the very apparent chemical corrosion of the pipeline appurtenances.

An ion is an atom or molecule where the number of electrons does not equal the number of protons. An anion has more electrons than protons while a cation has fewer electrons than protons. This inequality gives the atom or molecule a negative (anionic) or positive (cationic) electrical charge. Corrosion occurs when there is a flow of electricity from certain areas of a metal surface to other areas through a conductive solution or electrolyte such as rain or moisture condensed from the air.



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The anode is the point where positively charged atoms of metal leave the solid surface and enter into the solution as ions. Their negative charges in the form of electrons flow through the metal or any external electrical conductor to complete the circuit at the cathode, the metal surface to which current from the solution returns, where a corresponding reaction consumes these electrons. For corrosion to occur, there must be a formation of ions and release of electrons at the anodic surface--this is the deterioration of the metal. There must be a simultaneous acceptance of the electrons at the cathode surface--this is cathodic protection of the metal.

The development of anodic and cathodic sites depends on the condition of the surface, and is worsened by inclusions, stress, porous or semi-porous deposits, built-in crevices, galvanic effects between dissimilar metals and the occasional presence of "stray" electrical currents from external sources.

The field investigation confirmed the metallic components within the air release vaults had both internal and external corrosion at the piping threads, fittings and nipples, and on galvanized metal springs, hinges and vault lid doors. In some areas, concrete surfaces were deteriorating and exposed reinforcing steel was also corroding. Buried metallic fittings and ductile iron pipe sections along the force mains were also corroded.

DI and galvanized steel are relatively susceptible to ionization (giving up electrons) in a corrosive environment. The air released from the ARVs was intended to discharge to nearby manholes or to odor control canisters, but in some cases vented within the concrete vaults. The hydrogen sulfide released from the ARVs was mixing with moisture in the vaults and producing sulfuric acid which accelerated corrosion.

Inspection of metallic piping and valve materials removed from service confirmed that the corrosive sewage environment was destroying the threads of the tapping saddles and nipples. And, the soils had low resistivity, a property of corrosive soils, which encourages electron transfer along the pipe.

### Three remedial actions were developed to address corrosion.

(1) Vault Replacement – All 28 air release/vacuum relief valve vaults and internal components are being replaced, including vaults, piping, fittings, valves, odor control canisters and their enclosures. The internal components (service saddles, pipe and fittings) are being replaced with Type 316 stainless steel hatches are being replaced with aluminum, and all new enclosures are equipped with stainless steel hardware. Stainless steel (SST), a steel alloy containing iron and chromium, does not corrode as easily as steel. The chromium content in stainless steel reacts with oxygen to form a tough, adherent, invisible layer of chromium oxide film that protects the iron from corrosion. The higher the chromium content the higher a SST's resistance to corrosion. In addition, magnesium anodes were connected to the SST saddles to protect them externally because SST is not corrosion resistant when buried and deprived of oxygen. This process, using



Figure 1



Figure 2

sacrificial anodes, is known as a galvanic cathodic protection system. The magnesium, acting as the anode, gives off an electrochemical current that migrates through the soil and accumulates as a white film on the DI pipe, the cathode, creating a protective coating. Finally, the ARVs were plumbed to vent outside of the vaults to eliminate the formation of sulfuric acid in the vaults and its highly destructive results.

(2) Buried Metallic Fittings – Along the force mains, numerous DI fittings (bends, tees etc.) are installed in corrosive soils. Replacement of this large number of fittings was cost prohibitive, but sacrificial magnesium anodes are being attached to each metallic fitting as a cost effective solution.

(3) Impressed Current System - Where the force mains cross under a creek, the pipe material changes from PVC to DI, which is corroding at an accelerated rate due to the highly corrosive soils. The number of sacrificial anodes that would be needed made the galvanic cathodic protection system cost prohibitive, so an impressed current system (also known as an active cathodic protection system) was installed and uses an alternating current (AC) source. The AC power is fed to a rectifier and converted to direct current (DC). The DC is then applied to an anode bed. Due to the applied (or impressed) current, the anodes give up an electron, and send an electrochemical current through

*Continued on next page*

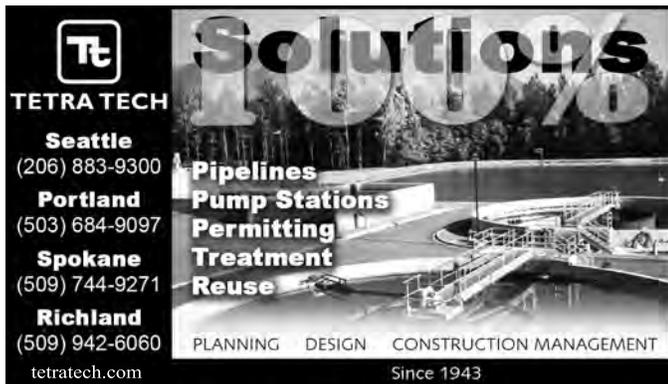
## Corrosive Deterioration of Two Critical Sewer Force Mains

*Continued from previous page*

the soil which reacts at the DI pipe to form a hydrogen ion build-up (white film) that protects the pipe. The cost is about half the cost of a galvanic cathodic protection system.

Three causes of corrosion were occurring along the force mains. The release of sewer gases into the enclosed vaults contributed to atmospheric corrosion of internal metallic components. Second, the buildup of raw sewage and scum within the force mains created an anaerobic atmosphere along the pipeline wall leaving the pipeline vulnerable to internal attack. Finally, the corrosive soils provided the environment to allow easy electrochemical transfer from one area along the pipeline to another. The solution was to install corrosion resistant components within the vaults and improve the internal environment by venting the ARVs to the atmosphere. Additionally, galvanic and active corrosion protection in the form of anodes and impressed current were added to the new stainless steel components and the buried ductile iron features. These measures will protect the facilities for at least another thirty years and allow Clean Water Services' twin force mains to continue to provide uninterrupted service between the WWTPs.

*Susan M. Gierga is a P.E. with Murray, Smith and Associates and may be reached at smg@msa-ep.com.*



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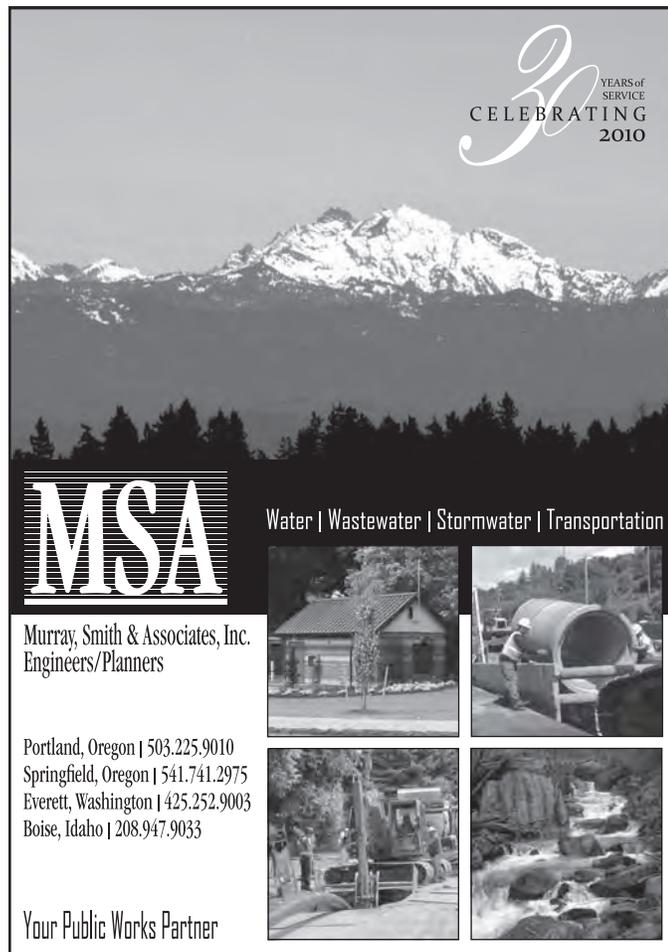
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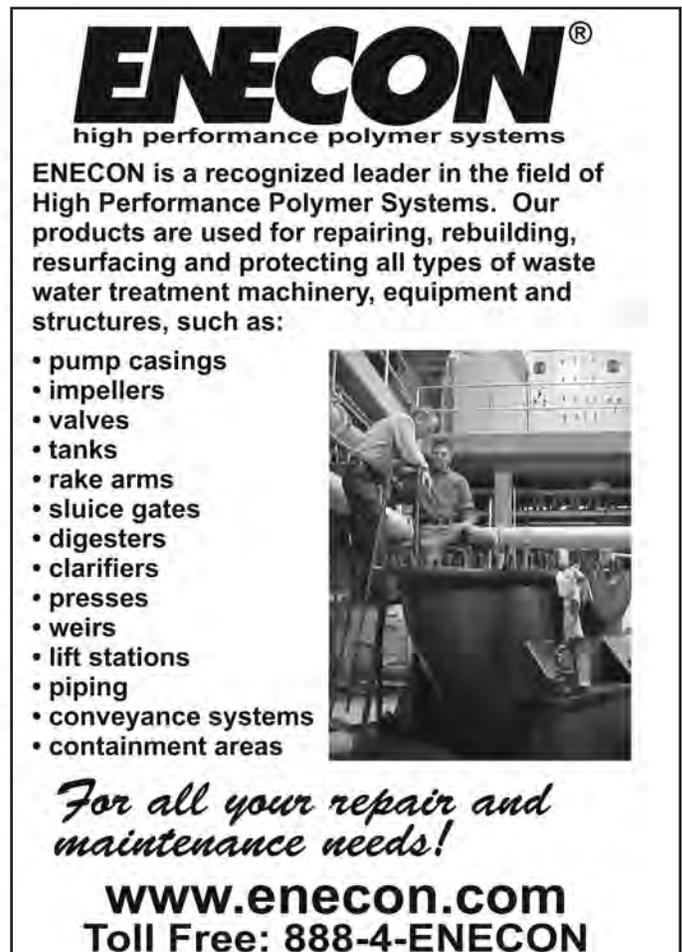
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Above: Sean Dempsey of Floating Islands West, Dave Brigante from Hughes Water Gardens (volunteer), Rebecca Sweet from Van Duzer Vineyards (volunteer). Below center: Sean Dempsey and Renee Stoops, SPROut Director, standing on a floating wetland at The Oregon Garden.

# The Oregon Garden Wetlands SPROut

*First winner of PNCWA Sustainability Award*

*By Renee Stoops, SPROut Director*

The SPROut program at The Oregon Garden Wetlands received PNCWA's first sustainability award in 2009. SPROut stands for Sustainable Plant Research and Outreach Center and its mission is to develop and promote the strategic use of plants (phytotechnology) to provide ecosystem services and solve environmental challenges in managed landscapes. In partnership with the City of Silverton, SPROut manages the functions, ecology, and water quality of The Oregon Garden Wetlands, a one-of-a-kind, award winning, natural wastewater treatment system.

SPROut director Renee Stoops described the Floating Wetland Loan and Research Program which began a few years ago with a system built by Rogue Water. Stoops said, "We experimented with the structural technology and plant selection to make the systems functional for water quality remediation and also harvestable for crop value." Crops grown in this manner may help on-site restoration activities or may help offset the installation cost of the floating treatment system.

Floating plant roots and microbiology in direct contact with water provided highly efficient treatment, according to the research. Floating wetland technology provides water treatment in existing ponds with no construction or excavation, unlike a constructed wetland system that is limited by available land area and usually has less than 3 feet of effective treatment depth. See the Rogue Water Botanical Burrito Report on the SPROut website at [www.sproutoregon.org/projects/](http://www.sproutoregon.org/projects/)

Nurseries, farms, and agricultural growers have water quality issues to manage whether they recycle or reuse water

or have water quality compliance guidelines for runoff. Many have ponds that could become a water resource rather than a liability. Mechanical and chemical treatments are expensive to install and maintain, but proven natural treatment options such as constructed wetlands may be ruled out by the volume of water to be treated or lack of available land. Stoops said, "For these situations, we need better data on the treatment and performance potentials of floating wetlands."

In the fall of 2009, SPROut installed three floating wetlands at The Oregon Garden to demonstrate the technology to visitors and experiment with plant selection and predator control. "We had generous help from Hughes Water Gardens for both installation labor and plant material donations. Several other community members donated labor for the installation, and we had a fun day turning bare islands into wetland oases," Stoops said.



SPROut also owns an Eco-reactor system with harvestable floating wetlands designed by Rogue Water that is similar to a living machine concept but with a focus on agricultural wastewater applications. SPROut will loan floating island modules to approved agricultural growers to build data on the effectiveness of this phytotechnology to remediate agricultural pollutants, offering a chance to try out this technology with no capital investment in exchange for participating in the research program with Oregon State University Extension.

*For more information, contact Renee Stoops at 503.584.7252 or [renee.stoops@chemeketa.edu](mailto:renee.stoops@chemeketa.edu)*

*To learn more about the PNCWA Award program see the article on page 28*



# Talking Water Gardens

By Mark Madison

## **Introduction by Hank Erbele West Central Operators Section**

The groundbreaking ceremony for the Talking Water Gardens took place on February 12th in Albany, Oregon. This wastewater tertiary treatment project is a joint effort of the City of Albany, City of Millersburg, and metals manufacturer ATI Wah Chang that have joined together to plan, design, construct, and operate this wetland at Simpson Park.

The Albany - Millersburg Talking Water Gardens are the first public/private engineering project of its kind in the United States: an integrated wetlands system designed to provide an additional level of natural treatment for a combined municipal and industrial treated wastewater flow.

An article by Hank Erbele about the Talking Water Gardens appeared previously in the Oregon West Central Operators Newsletter



The Talking Water Gardens is a public/private engineering project for an integrated wetlands system designed to provide an additional level of natural treatment for a combined municipal and industrial treated wastewater flow. This wetlands park will use recycled water from the Albany-Millersburg Water Reclamation Facility (WRF) and the Wah Chang wastewater treatment facility to reduce effluent temperatures and improve water quality in the Willamette River. The wetlands park will also treat total dissolved solids, and the combined effluent will discharge through the existing Albany outfall high-efficiency diffuser to achieve permitted mixing zone TDS concentrations.

In concert with these technological innovations, the wetlands park will improve ecosystem services that benefit the public, including wildlife habitat and water quality improvements beyond the levels required by permitting through natural processes that remove nutrients and metals to very low levels. Taking advantage of the unique opportunity this project presents, the wetlands park is designed to incorporate community amenities for biking, walking, wildlife viewing, aesthetic appreciation, and public education.

Municipal and industrial wastewater has been discharged into natural wetlands for more than 100 years in the U. S., and the design of constructed engineered wetlands began in the 1950's. Large strides have been made towards optimizing the efficiency of sustainable natural treatment systems. This article describes how Talking Water Gardens works.

Wetlands energy comes from the sun, the wind, the soil, and topography. Water is pumped to the site, but the rest is natural. Sun energy drives photosynthesis, and a healthy plant system is the superstructure for the organisms that provide treatment. A wetland full of plants provides ten times more treatment surface area than pond bottom and sides, and the plants consume 13 basic elements, as well as nitrogen, phosphorus, and potassium nutrients. Most of these elements (calcium, magnesium, sulfur, zinc, iron, manganese, copper, boron, molybdenum, chlorine, carbon, hydrogen, and oxygen) are considered pollutants if dissolved in water. Captured by the plants for growth, these same elements are sequestered in the organic material that settles to the bottom of a wetland and supports another layer of life as a food source for decomposing organisms. This is the same natural growth and decay process



Illustration (opposite top): Talking Water Gardens planting plan, courtesy the author. Illustration (above left), Aerial view as it will look when completed, courtesy the author. Photograph (above right) Ground breaking ceremony: With shovels, Millersburg Mayor Clayton Wood, Albany Mayor Sharon Konopa, John Sims/President –ATI Wah Chang, photo by Hank Erbele

**Construction started in February on the Talking Water Gardens, named for the sound of waterfalls, a splashing creek, and water movement . In two years the gardens will be open for visits from the public.**

that happens in wetlands and along stream banks throughout our watershed. Typically, the plants in constructed treatment wetlands are not harvested to remove nutrients, and the 16 essential plant nutrients can be sequestered in plant materials and wetland sediments.

Shade created by tall emergent wetland plants, floating aquatic plants, and trees block the sunlight and heat energy from warming the water during the day. Wetlands cool the water before it enters the river primarily by energy loss at night when heat transfers from the water surface to the atmosphere. Evaporation and evapo-transpiration also cool the water and are accelerated by the waterfalls and cascades. In just two nights in July and August the water temperature will drop five degrees, suitable for discharge into the Willamette River. The heat energy removed from the 12.6 mgd flow is at least 150 million kilo-calories per day, and in the fall water discharging from the wetlands will be up to 10 degrees cooler than the water from the treatment facilities.

People have asked why spend so much to cool water when we can't cool the whole river. This project is located where the combined temperature impact from all of the municipal and industrial discharges is at its maximum and will discharge a plume of much cooler and cleaner water into the river. The cooler Albany wetlands

water can provide a critical stepping stone that enhances fish passage from the cool waters at the confluence of the Santiam River to the cool waters at the confluence of the Calapooia River.

Water discharging from a wetland has a much more natural mineral makeup or geologic signature than water from the WRF, and for fish passage it is like water from a natural stream with particles of plants, aquatic microorganisms, insects and amphibians. Wetlands are great incubators for many levels of the aquatic food chain and provide food for fish.

Wind creates movement of the millions of tall emergent plants and creates a very efficient zone of mixing around the submerged stems as they are pushed back and forth through the water like mixing spoons in a large bowl of soup. Mixing brings the food in the water into contact with organisms attached to plant stems in a bio-film and living near the bottom of the marsh. Wind energy moves the evaporated water away from the air/water interface, allowing more water vapor to escape and latent heat to transfer from the water to the atmosphere. Wind drives evapo-transpiration which removes heat from the water and plant leaf surfaces.

Soil supports the plants, provides them nutrients, and is thriving with many forms of life from fungus

to arthropods. The minerals in the Willamette silt loam of the wetlands are dissolve as water passes through the soil, giving the water a mineral signature like natural wetlands along the Willamette which helps fish find the tributary where they were born. As water contacts the soil in the wetlands it becomes more like the water in the river before discharging to the river.

Topography of the Talking Water Gardens will add high energy input that most wetlands lack, as cascades and waterfalls provide more cooling and aeration. Many processes in a conventional WRF are limited by the amount of oxygen that can be provided to the bacteria that consume the waste, and a lot of energy is used to pump air into WRF tanks for the biological treatment process. Here the drop from pool to pool increases the oxygen available for supporting biological growth, thereby increasing the treatment rate. Water falling and cascading from one wetland cell to another will entrain air needed by aquatic life, and the rushing waterfalls and drops will mix the water like a mountain stream further dispersing nutrients and food throughout the aquatic food chain. For more information, visit [talkingwatergardens.com](http://talkingwatergardens.com).

*Mark Madison is an environmental engineer and principal technologist in natural treatment systems for CH2M HILL. He may be reached at [mark.madison@ch2m.com](mailto:mark.madison@ch2m.com).*

# Water Reuse in Corvallis, Oregon: Planning for Public Input

By Karen DuBose

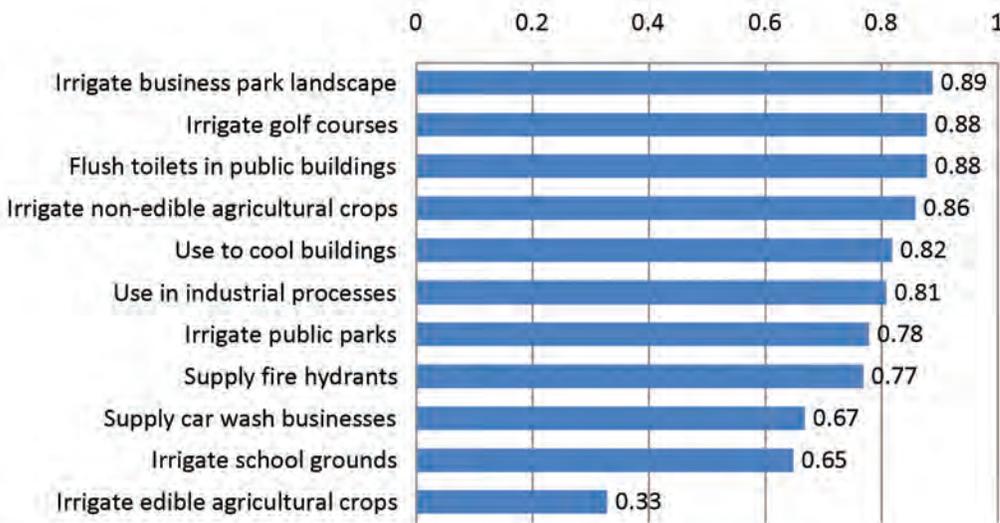
Like many cities, Corvallis, Oregon is pursuing water reuse as a way to meet water quality requirements in receiving waters. While some cities have succeeded in implementing water reuse programs with only minimal public input, others have carried out considerable public outreach campaigns to ensure success. How much public outreach is enough? To help Corvallis officials understand how to approach public outreach, a survey was designed to assess the public's level of knowledge and acceptance of reclaimed water.

Results indicate that although survey respondents are unfamiliar with wastewater treatment, they appear to approve of a variety of water reuse practices (Figure 1), suggesting that an extensive public involvement campaign may not be warranted. However, the survey also found that the sustainability of a proposed project – the financial cost, environmental effects and public health considerations – is perhaps the single most important factor affecting respondents' acceptance of water reuse. Because a specific plan with defined costs, benefits and risks has yet

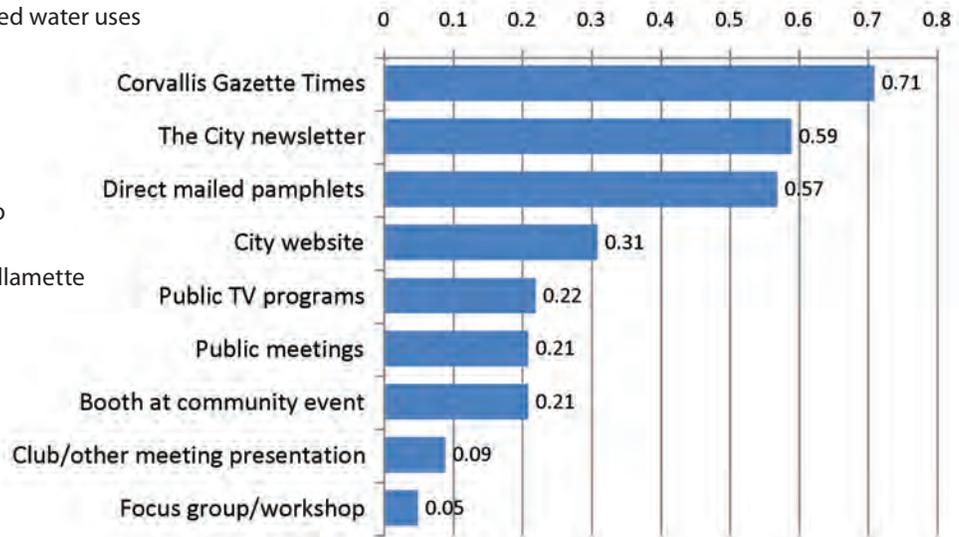
to be presented to the public, this initial acceptance should be considered hypothetical, and the city should reassess opinion when they have more information. Acceptance of water reuse also appears to be affected by the respondents' trust in the utility to serve public interest, and prior knowledge of wastewater issues.

When asked how the city should communicate its plans with the public, respondents clearly preferred that information come to them rather than seeking it out themselves. The most frequently chosen methods were articles in the local newspaper and city newsletter, and mailed pamphlets (Figure 2). However, it is important that citizens have opportunities to provide feedback, so the city should not rely exclusively on these methods.

With the help of this study, Corvallis is moving forward with its reuse plans. Once costs, benefits and risks of water reuse options have been identified, another survey will be performed to reassess public opinion. This, in combination with the current study, should give the city a clear idea of how much and what kinds of outreach will be necessary to gain acceptance for water reuse. For more information, contact Karen DuBose at [karendubose@comcast.net](mailto:karendubose@comcast.net).



↑↑ **Figure 1.** Percentage of respondents choosing “very favorable” or “favorable” for various recycled water uses

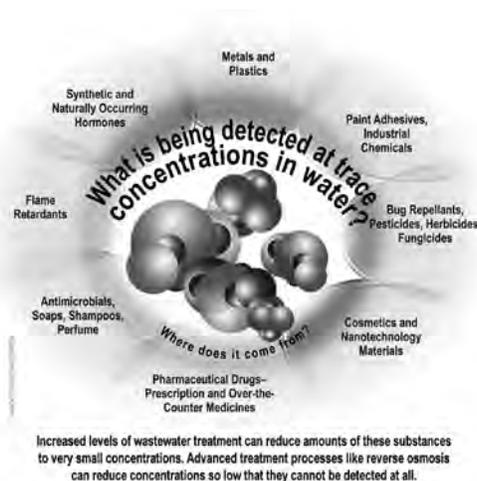


**Figure 2.** What are the best ways to communicate with you concerning how Corvallis will meet the new Willamette River regulations? ⇨

# Talking Substance About Detection ... or Naming the Substances We Detect?

By Emily Callaway and Linda Macpherson with science communicator and author Jenifer Simpson

There is a movement in the water and wastewater industry to find a name to use when discussing the large number of substances that are found in water at trace concentrations. Several terms have been proposed and used in technical and media communications, including the terms *microconstituents*, *trace organics*, and *endocrine-disrupting compounds*. However, these names are not well understood by either the public or the media, resulting in confusion regarding the implications for human health. A major challenge surrounding the topic is communicating the significance of trace concentrations, and how these compounds should be addressed from a



regulatory stand-point. The water and wastewater industry needs to change their vocabulary and develop a clear method of communicating about these trace substances in a way that fosters public trust and understanding.

Many synthetic organic chemicals have found their way into the environment. They include pharmaceuticals, detergents, insecticides, pesticides, cosmetics, fragrances, plasticizers and many more – there is scarcely any part of our modern lives where we don't come into contact with them. Society chooses to use them for many good reasons including the fact that they can extend our life spans and improve our quality of life. Synthetic organics have been the subject of many attention-grabbing press accounts due to the fact that they tend to bio-accumulate (show up in increasing quantities

*Continued on next page*



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## Talking Substance About Detection ... or Naming the Substances We Detect?

*Continued from previous page*

the higher up an animal is in the food chain) and because they may be linked to sexual abnormalities in fish.

People are understandably concerned when they read that these substances are detected in drinking water. Media has taken the descriptive scientific name of endocrine-disrupting compounds out of context while cartoons have humanized the sex-change effects observed in fish, leading some to believe similar reproductive problems are inevitable in humans. This fails to reflect the fact that humans do not spend 100% of their lifetimes immersed in water as fish do. Of course it is important to understand the influences on aquatic life but it confuses the real findings to draw inappropriate inferences for human health. The other critical thing that is often overlooked in media reports is the fact the concentrations being detected are *exceedingly small*. As Southern Nevada Water Authority (SNWA) researcher Dr. Shane Snyder recently noted, "the highest concentration of any pharmaceutical compound in US drinking waters is approximately 5,000,000 times lower than the therapeutic dose." Imagine drinking a glass of water that had one five-millionth of an ibuprofen tablet dissolved in it. Is it reasonable to think that this could have a measurable effect on your body? You would need to drink five million glasses of water in order to consume the equivalent of a single tablet (and that might not even be enough to take care of your headache).

Unfortunately, we aren't given the tools in our education or media communication to differentiate between our considerable exposure to these substances during our everyday activities and our minimal exposure to them in water, nor to understand what effects, if any, they might really have. When the media runs an alarming headline calling these everyday substances contaminants, compounds of emerging concern

or, worse, unknowable unknowns, those of us who aren't scientifically trained to understand those terms grow fearful. Our gut reaction is to demand the complete removal of these trace substances.

Highly advanced wastewater treatment processes like reverse osmosis can reduce concentrations to below current detection limits, effectively meeting the common definition of removal. However, current detection limits may soon be obsolete as detection technology grows more and more advanced, allowing detection of smaller and smaller concentrations. "Zero" and "completely removed" will always remain elusive but we can expect the concentration of the compounds to be "reduced" so they do not pose a threat to human health.

Although water treated by reverse osmosis meets the current definition of pure (non-detectable concentrations), this advanced wastewater treatment requires a large capital investment and a large amount of electricity to operate. The ecological impacts of this cannot be ignored in light of the current global realization of the negative effects of rampant energy consumption. Treatment technologies need to be thoughtfully considered and selected to provide the right level of treatment for the intended use. Regulation of these substances should only follow, not precede a very thoughtful, thorough, and scientific examination of the risks and environmental and public health impacts of such choices.

The critical question is not whether we can find things in water or what one word we should call them but, rather, do they exist in concentrations that cause harm? Continued research is needed to assist decision-making about future management of these substances. It is inappropriate to equate detection of such materials with unacceptable risk to humans or the aquatic environment.

The water and wastewater industry are actively engaged in the discussion about the threat of harm, potential regulation, and the best way to effectively communicate with the public in a way that builds trust and reduces fear. The industry has just begun to realize there is public and media confusion regarding substance detection, the impact of the small concentrations of synthetic organic compounds, and their implications for human health. This confusion underscores the need for the water industry professionals and scientists to communicate clearly with each other and with the public.

In summary, within the water industry, there has been an extraordinary focus on naming the substances we are detecting. The industry is looking for just the right word or phrase to group together a broad and disparate group of substances that are byproducts of everyday modern life so that we can talk about them neatly, succinctly, and above all, scientifically. Unfortunately, such a grouping and generalized characterization of these substances tends to frustrate rather than advance public understanding as it implies there is a scientifically valid commonality of risk from the materials at trace concentrations. This well-intentioned simplification suggests that a host of potentially harmful substances are being detected in our nation's waters. What we need is an honest presentation of scientific findings about detection and risk in familiar terms, without confusing the issue with a catch-all umbrella phrase, especially one with ominous overtones that leads us to believe there is something new and evil lurking in our waters.

Scientists and water professionals have a responsibility to help people understand risks and to pay attention to the impact their words have on a community that has poor understanding of water science.

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## Asset Management—Workflow Process Optimization

By Marc Yarlott, Chair, Asset Management Committee

In early January, I participated in a workflow workshop that demonstrated the potential value of carefully considering each workflow and process in an organization. The workflow process was to create a work order in our corporate Enterprise Asset Management (EAM). This included identifying the problem, confirmation of the asset by operations management, and confirming the account to charge the work to. Initially, this entire process took 32 to 36 mouse clicks, but after reconfiguring and preloading the process now takes 7 to 14 clicks.

Not a big deal, right? Well, a project engineer pulled out his calculator and estimated annual savings of 108,000 clicks and potentially 300 man-hours. This large maintenance department immediately recognized that the time saved could be used to leverage other process improvement initiatives, and a sixty man-hour workshop saved 300 man-hours.

This experience confirmed the potential savings from the processes described in *Lean Six Sigma for Service*, by Michael George. The book provides examples where Lean, optimizing the process, and Six Sigma, improving the quality, has had significant savings in time and cost of work. The examples include improvements for medical, banking, and engineering, all typically service intensive processes and very different from the manufacturing industries that developed many of these principles.

Because business and municipal government revenues are likely to be tight in 2010, process improvement or the way we do our work and provide our services is a good resource for Asset Management initiatives. While the effort to free up internal resources may be disheartening, it really is a benefit because organization change is a necessary discipline. Process improvement initiatives like Lean and Six Sigma establish an attitude of continuous improvement and change which is the key to long term success for Asset Management.

I hope you will consider a process improvement program for 2010. Here are low cost resources to help you get started:

- Reading List: I recommend in *Lean Six Sigma for Service*, by Michael George. Keep your eyes open for magazine articles, too.
- Learn how to diagram a workflow process and identify the steps it takes to accomplish a particular work process. ThinkReliability.com is a free resource that gives regular webinars that focus on Root-Cause analysis and does a great job of breaking down work processes using Microsoft Excel. You can find more here: <http://ydesign72705.blogspot.com/search/label/Root-Cause>
- Look for opportunities to network with organizations that have or are initiating a solid process improvement program. Consider attending their workshops to learn how to facilitate a process improvement initiative.

This year, I will continue to post work process improvement ideas in my Scrapbook Blog, and Asset Management Newsletter, both linked to at [www.pncwa.org/page/asset](http://www.pncwa.org/page/asset).



## Students and Young Professionals Restore a Wetland in Orlando

By Haley Falconer, PNCWA SYP Committee member

Braving the heat and humidity to restore a treatment wetland, about 50 students and young professionals made an outstanding team at WEFTEC.09 in Orlando. "Wading for Wetlands" is a project organized and executed by the WEF Students and Young Professionals Committee (SYPC) that planted over 1,000 wetland species that will revitalize a previously unplanted area of an existing wetland. Nearly seven acres was replanted in a 70 acre wetland system at the Orange County Northwest Water Reclamation Facility (NWRf) outside Orlando. Wastewater effluent flows through a series of wetland cells and eventually into a lake, ultimately serving as lake augmentation. Two wetland species, Arrowhead *Syngonium Podophyllum* and Fire Flag *Thalia Geniculata*, were planted to increase biodiversity and remove nutrients. Within a year, the wetland plants should grow to over six feet high.

In addition to a traditional treatment system, the Orange County NWRf is unique in that it utilizes treatment wetlands, groundwater recharge and supports lake augmentation. Volunteers toured the site with wetland biologists to learn more about the design of constructed wetlands, and how plant and animal diversity are indicators of a healthy ecosystem.

The SYPC would like to thank WEF and the Orange County NWRf for their assistance and coordination for this project. Volunteers endured heat and humidity, but finished the day knowing they had accomplished something great. Thanks, also, to the service project sponsors: Advanced Engineering and Environmental Services, Black and Veatch, Brown and Caldwell, CDM, CH2M HILL, Chesapeake WEA, and Stantec.

*Continued on page 25*

## Could your organization use a DOSH Safety and Health Consultation?

By Jim Lawrence, Washington State Department of Labor and Industries

You work hard to manage your business and control costs. You care about your employees. A safety and health consultation may be just what you need. The Washington Department of Labor & Industries (L&I) offers a service that may be very helpful to you. It is specifically designed to help you increase safety awareness, prevent accidents, and manage workers' compensation costs.

Here's how it works: At your request, a safety and health consultant will come to your business and analyze your employee safety and accident prevention programs. You will be offered suggestions that could help save money on your industrial insurance costs.

You'll like this approach for several reasons:

A safety and health consultation is an investment in your organization and in your workers. If it helps prevent accidents, it will lower your workers' compensation costs and increase your profits. There's no charge for the consultation.

You cannot be fined by a consultant as a result of the consultation. You will be required to correct serious hazards, but you face no financial penalties.

The consultations are not shared with enforcement staff. No L&I inspector will see a copy of the consultant's report unless you volunteer it. However, you may choose to use this report as evidence of your good faith effort to provide a safe workplace.

There's no obligation. If you change your mind about the consultation or don't like what you're hearing, you may end the consultation at any time. However, you must correct any serious hazards noted by the consultant.

You can involve your safety committee and employees who work in potential accident areas. The consultant will meet with your safety group, explain their findings, and provide backup educational materials.

A consultation involves:

- An opening conference with management to explain the employer's rights and obligations.
- A walk-through survey to evaluate the mechanical, physical and environmental hazards of the workplace and work practices, and an evaluation of your accident prevention program.
- A closing conference with management to discuss any conditions noted during the survey and to make recommendations.
- A written report describing any conditions found and any recommendations or agreements made.
- A follow-up visit, if appropriate, to assure that any necessary corrections have been made.

You must agree to the following conditions before a consultant can begin the actual on-site consultation:

- Correct, in a timely manner, any serious job safety and health hazards or deficiencies found during the course of the consultation visit.
- In unionized work areas, an employee representative must be provided an opportunity to participate in the opening and closing conferences and the walk-through survey.
- The consultant may increase the number of employee participants in the evaluation, if additional representatives will improve the quality of the visit.
- At all work sites, the consultant must be able to confer with the individual employees during the course of the visit. This helps the consultant identify and judge the extent of particular hazards within the scope of your request and evaluate your company's safety and health program.

You may request assistance from L&I by telephone, letter, or in person. The request may be for a complete review of your company's safety and health conditions, for assistance or information concerning a specific problem, or both. The consultant will contact you, usually by telephone, to hear your request and to schedule a time and date for an on-site consultation. <http://www.lni.wa.gov/Main/ContactInfo/OfficeLocations>.

The more you learn about potential workplace hazards and ways to eliminate them, the better you will be able to meet your legal obligations of ensuring employee on-the-job safety and health. The resulting benefit to employees is a safer and healthier place to work.

The DOSH Consultation Program offers you free professional advice and assistance in establishing or strengthening your workplace safety and health program.

### May 6 Webinar - "How to Avoid Enforcement" Safety & Occupational Health Webinar

**Moderator** – Mike Myers, Chair, PNCWA Safety and Occupational Health Committee

**Presenters:** -Jim Lawrence, Washington Labor & Industries Consultative Services: "How does OSHA Compliance target you? What is the best method to avoid compliance: Avoidance vs. Proactive Approach? How can consultation services help?"

Cory Stengel, Oregon OSHA: "Why call OR-OSHA for a consultative visit? OR-OSHA consultation provides many no-cost, confidential services. Benefits of improving your safety and health program."

Thomas "Bud" Ruther, CH2M HILL/City of Walla Walla: "The Road to VPP—What is it? Why get involved? What it takes. The cliffs, crashes, and crazies!"

**Learn more at [www.pncwa.org](http://www.pncwa.org) and sign up on line.**

# What Works!

The PNCWA Plant Operations and Maintenance Committee (POMC) is pleased to introduce a new feature of the newsletter entitled "What Works!" to present articles that will aid personnel in the operation and maintenance of wastewater systems. Formed by the PNCWA Board of Directors on September 13, 2009, the POMC was established to:

- Develop regional O&M Workshops and Training that supplements the training opportunities already existing within our Regions
- Develop pre-conference workshops at the Annual Conference
- Sponsor technical sessions at the Annual Conference
- Work with other PNCWA Committees (Asset Management, Collection Systems, Emerging Technology, Safety and Occupational Health, etc.)
- Produce newsletter articles
- Be a vehicle to reach out to wastewater O&M staff.

The POMC is busy putting together quality training for this year. Tentatively planned are two webinars with related topics so you'll want to attend both. Watch for announcements regarding registration in the weeks ahead.

The POMC is also planning a pre-conference workshop, pending approval by the Pre-Conference Workshop Subcommittee. The workshop is specifically designed for engineers, and will have the title, "The Good...The Bad...and The Ugly: Making Treatment System Design Operator Friendly." It is anticipated that the Collections Committee will co-sponsor the workshop. Although engineers are the targeted audience, operators will also benefit from this workshop on treatment system design.

## SYPs Restore Wetland in Orlando

*Continued from page 23*

Planning is already underway for the third annual SYPC service project at WEFTEC.10 in New Orleans to construct a bioswale in the Holy Cross neighborhood of the Lower 9th Ward that was devastated by Hurricane Katrina in 2005. To promote environmental education and engage the community, the SYPC will host a water carnival. PNCWA helped fund a trip for Haley Falconer to New Orleans in February (during the WEF Mid-Year Meeting) to get these projects rolling. If you are interested in getting involved in the service project, please contact WEF SYPC Service Project Chair Haley Falconer at [haley.falconer@hdrinc.com](mailto:haley.falconer@hdrinc.com)

As this annual service project grows at WEFTEC, the SYPC is challenging WEF Member Associations to complete service projects of their own. A fantastic way to improve our communities, service projects are a proven way to engage students and young professionals in our field and ultimately showcase and applaud the efforts of each MA at WEFTEC every year.

**April 22 - Webinar "Asset Management: What's In It For You, Lessons Learned, and How You Benefit"**

**May 20 -Webinar "Computerized Maintenance Management Systems (CMMS): What You**

### Current POMC

Vice-Chair *Monica Anderson*, City of Wilsonville, Oregon  
*Shirley Carter*, Hayden Area Regional Sewer Board, Idaho  
*Richard (Dick) Finger*, Consultant, Washington  
*Dawn Hanthorn*, Meduri Farms, Inc., Oregon  
*John Harrison*, RM Towill Corporation, Hawaii  
*Kay Hust*, Clark County Public Works, Washington  
*Ben McConkey*, LOTT Alliance, Washington  
*Mike Myers*, Consultant, Washington  
 Chair *Ron Moeller*, Kennedy/Jenks Consultants, Washington

If you would like to volunteer and be a part of this exciting committee, or if you have ideas on how the POMC can best serve you, please contact committee Chair Ron Moeller at [RonMoeller@kennedyjenks.com](mailto:RonMoeller@kennedyjenks.com) or Vice-Chair Monica Anderson at [manderson@ci.wilsonville.or.us](mailto:manderson@ci.wilsonville.or.us). And don't forget to see "What Works!" in future newsletters.



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# Snake River Phosphorus Limits Spur Boise to Seek Watershed-wide Treatment Options



Boise's plan to remove phosphorus from an irrigation return drain could shift focus from wastewater treatment plants. Pictured: City of Boise WWTF

By Kris Wilson, City of Kuna, Idaho

The federal Clean Water Act requires states to maintain minimum water quality standards for America's rivers and water bodies. The Snake River Hell's Canyon area has been identified as a contaminated watershed. In response, the Snake River-Hells Canyon Total Maximum Daily Load (TMDL) outlines specific limits on the amount of phosphorus introduced to the Snake River. Phosphorus contributes to eutrophication of the river's ecosystem, causing abnormally high levels of algae growth and subsequently low dissolved oxygen levels. This threat to the aquatic ecosystem is particularly destructive to trout and salmon populations.



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- Collection system construction and rehabilitation



Because the Lower Boise River Watershed contributes 17% of the phosphorus load to the Snake River, Boise and surrounding communities are required to reduce phosphorus discharge from wastewater treatment facilities. Upgrading existing facilities to meet the demands of the new phosphorus discharge limits represents a substantial financial burden to cities, and ultimately the sewer users.

Using a watershed-wide approach and phosphorus trading strategy, the City of Boise plans to remove phosphorus from Dixie Drain, an agricultural irrigation return drain that is 40 river miles downstream from their wastewater treatment plants. Dixie Drain contains high levels of phosphorus from non-point source nutrient runoff that contributes to the Lower Boise River's total phosphorus load. City wastewater will not be transported to the Dixie Drain for treatment. Instead, phosphorus will be removed from the Dixie Drain flow to reduce the total load of the Lower Boise Watershed. The concept is straightforward; if the maximum daily limits apply to the entire watershed, it does not matter where in the watershed the phosphorus is removed or prevented from entering the river system. The motivation is financial. Capital improvements to the city's wastewater treatment facilities required to meet the phosphorus removal regulations are estimated at \$60 million, while the improvements at Dixie Drain are anticipated to cost substantially less.

Paul Woods, Boise's Environmental Division manager, stated that the city was fortunate to have access to years of data acquired by USGS monitoring of Southwest Idaho's drain canals. Using phosphorus level and total daily flow rate data, the City of Boise calculates that phosphorus removal requirements for the city's wastewater treatment plants could be met through treatment at the Dixie Drain. "The city is offering to remove more total pounds of phosphorus from Dixie Drain waters than would be required if we treated at the wastewater plants alone," Woods said. "Although we have not decided the exact phosphorus removal process, we want to keep operations simple and cost effective. Lower capital infrastructure investments at Dixie Drain combined with higher annual operation and maintenance costs must compete with higher capital infrastructure investments at the treatment plants with lower annual operation and maintenance costs."

# Section NEWS

**Section Leaders**—email your news and pictures to your Regional Director and copy the newsletter editor, [wantlands@cleanwaterservices.org](mailto:wantlands@cleanwaterservices.org).

## West Central Oregon Section (WCOS)

In the past ten years WCOS has accomplished a great deal, including \$8,500 in scholarships to Linn Benton Community College, 10 awards to outstanding wastewater treatment and collection operators, 30 Plant Profiles and seven workshops, and the full-color newsletter "West Central Operator's Report." WCOS is seeking officers and volunteers. Contact President Robert Jones at [robert.jones@spiritmtn.com](mailto:robert.jones@spiritmtn.com) or Vice President Gary Still at [gary.s.still@ci.eugene.or.us](mailto:gary.s.still@ci.eugene.or.us).

## Southwest Idaho Operator Section (SWIOS)

SWIOS ushered in 2010 with its annual Sponsor Appreciation Party and kicked off training with industrial pretreatment by Steve Maneck (City of Meridian) in February. The main event will be the conference in Boise, May 23 – 26, packed with good training and fun events. Contact conference chair Rick Christenson at 208-345-5363 or [Rick@benchsewer.org](mailto:Rick@benchsewer.org).

## North Idaho Operator Section (NIOS)

NIOS has formed seven committees: Sponsor Recruitment; Membership Recruitment; Bylaws; 2011 Water/Wastewater Conference; Web Site Development; Awards submittals and selection; and, Education. Training in February focused on lift station control and troubleshooting. April training will be on water/wastewater math. Contact: Rodney Cook, City of Moscow, [rcook@ci.moscow.id.us](mailto:rcook@ci.moscow.id.us).

Bill Stewart, with the US EPA in Boise, is cautiously optimistic that the plan will succeed. He has also reviewed the USGS data and believes the plan could "actually keep more phosphorus out of the Lower Boise River than treatments at the wastewater plant that would achieve the 0.07 mg/L phosphorus discharge limits." Stewart confirmed that the plan is unique and said, "This plan is something different than anything else out there. The EPA has legal staff reviewing the plan to ensure that it conforms to the regulations as they are currently written."

Phosphorus removal at the Dixie Drain would be coupled with a struvite reactor at Boise's wastewater treatment plant. The reactor would remove a percentage of the phosphorus from Boise's wastewater, reducing effluent levels to the 0.5-0.6 mg/L range, while producing the marketable phosphorus rich fertilizer ingredient struvite. This will provide a revenue source for the city's wastewater treatment operations and contribute to the total phosphorus removal requirements.

Although the plan has not yet been approved by the EPA, the City of Boise has purchased a 49 acre parcel on the Dixie Drain for phosphorus removal operations. "The EPA seems to be on board with this concept, but this project would set a precedent, so we expect the review process to take some time to complete," said Woods.

The agreement between the EPA and the City of Boise for the phosphorus treatment strategy would not be open-ended. If the Dixie Drain phosphorus levels become so low that the city cannot remove enough to meet the phosphorus removal requirements, the city would be obligated to focus its efforts at the wastewater treatment plants.

In addition to the legal hurdles, the Dixie Drain phosphorus removal plan poses operational challenges. The City of Boise will have to establish remote operations in neighboring Canyon County. "Boise has good relations with its neighbors. We have regular meetings with other Lower Boise Watershed Communities regarding the phosphorus issue," stated Woods. The logistical challenge of a remote water treatment operation is compounded by the fact that the Dixie Drain site is a wetland in an area of Idaho notorious for its mosquito population. Mosquito abatement programs reduce the risk of infectious diseases such as West Nile virus, but they can be costly. Because the city has purchased land with a mosquito problem, Woods said, "The City of Boise intends to contribute to Canyon County's Mosquito Abatement Program through the efforts of Boise's wastewater operations staff at the Dixie Drain site."

Boise's plan is innovative in its approach to reducing nutrient loading in a watershed. By seeking alternative methods of reducing the amount of phosphorus entering the Lower Boise Watershed, the city hopes to prevent high costs of wastewater treatment and reduce the total phosphorus load in the Snake River to levels below the limits established by the Snake River-Hells Canyon TMDL. This may prove to be an effective model for other municipalities faced with cleaning contaminated watersheds.



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# Call for Awards Nominations

*"Strive not to be a success, but rather to be of value."  
- Albert Einstein*

There are so many PNCWA members who have provided value to our profession! Please consider nominating someone you know for one of the many PNCWA and WEF awards, so they can be recognized and celebrated.

There are over 10 categories for PNCWA awards, which honor PNCWA members and wastewater professionals in Idaho, Oregon, and Washington. Our awards program serves to recognize outstanding professional achievements within the wastewater field, improve the professional status of all personnel working in the wastewater industry and related fields, and stimulate public awareness of the importance of wastewater treatment to public

health and the water environment. There are also 5 WEF/MA awards, all designed to honor outstanding achievements associated with the water environment.

All PNCWA and WEF/MA Award nomination forms are available as online forms at [www.pncwa.org](http://www.pncwa.org)

Timeline for Awards for 2010:

- July 1: Nominations deadline
- July 1- July 15: PNCWA Award Winners selected by the PNCWA Awards Committee.
- October 24-27: All award recipients will be acknowledged at the PNCWA Annual Conference. Award recipients will be notified in time so they can plan to attend.

For more information, visit PNCWA's website at [www.pncwa.org](http://www.pncwa.org), or contact Awards Committee Chair Cyndy Bratz at 208.389.7700 or [cbratz@brwncaled.com](mailto:cbratz@brwncaled.com).



## Dispersible vs. Flushable:

*by Patrick McNelly – Principal Staff Analyst, Orange County Sanitation District*

Many public wastewater agencies throughout the State of California are experiencing significant maintenance costs associated with the accumulation of nondispersible and other post-consumer products that are routinely flushed down the toilet. Some obvious examples we see every day are cotton balls, Q-tips, condoms, feminine hygiene products, cloth bandages, rags, plastic items, disposable diapers and dental floss.

Of more recent concern are so-called baby wipes and pop-up sanitizing cloths that do not disperse or break-up in water like toilet paper. The main problem with these nondispersible products is that they can become lodged in the impellers of sewage pumps and other process equipment causing the

pumps to stop suddenly and sewage to back up. For many agencies (particularly small to mid-size and those with several smaller pump stations) removing these "rags" from pump station pumps and bar screens has become a costly additional maintenance routine.

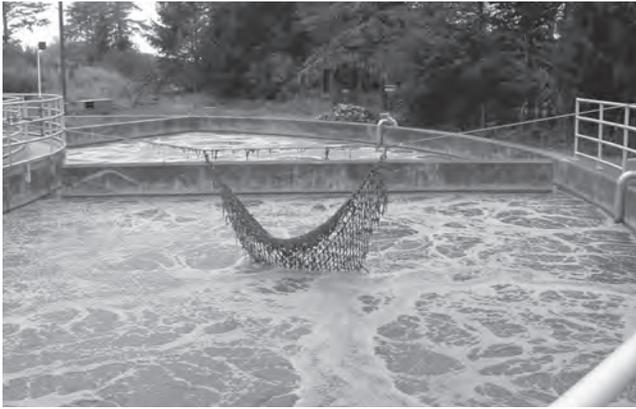
In gravity sewers, these woven-fiber cloth products and other similar items can get caught on tree roots inside the pipes which can lead to backups and sanitary sewer overflows (SSOs). These SSOs consume valuable agency resources, violate the state-wide Wastewater Discharge Requirements (WDR) order, and can result in significant fines being levied against the agency by the regional water quality control board.

### Flushability and Dispersibility

Because of convenience and advertising claims that these products are "flushable," the consumer feels confident in disposing a wide range of products down the toilet. These products are "flushable" only in the sense that they can usually be flushed without causing the toilet to back up. The real test of anything besides human body waste being flushed is whether it disperses or breaks up when it gets into the sewer. If it doesn't disperse, it doesn't belong in the sewer. Truly flushable products, such as toilet paper, are manufactured so that the paper material breaks down when wet, causing them to be classified as dispersible products, and safe for sewers.

While there are several Uniform Plumbing Code restrictions and regulations that specifically prohibit the type of materials that can be disposed of into sewer systems, there are currently no restrictions on these nondispersible products.

For example, a recent television ad by the Kohler Corporation features a man who notices a very attractive female plumber working next door as he is walking into his home. When he goes inside, he tries to clog up his toilet (hoping that he can hire her to unclog it!) by flushing assorted items including facecloths, candles, underwear, flowers and toiletries. The man finally resorts to pouring a large bag of dog food into the toilet. While he is pouring the food into the toilet bowl, the man looks up



Recycled fishing net keeps hair from snarling Depoe Bay's treatment train.

The Depoe Bay Wastewater Treatment Plant is a conventional activated sludge plant that serves 5,000+ people, including the tourist communities of Gleneden Beach and Lincoln Beach. Built in the early 1970s, the original "donut" plant included aeration, a secondary clarifier and aerobic digester all in one tank. It worked well enough that when it came time to upgrade, a second donut plant was added and UV disinfection replaced the chlorine system.

## Trick of the Trade: Depoe Bay Hair Nets

*Submitted by Max Hildebrand, Oregon Region Director*

One problem that Operators Dan Arnold and Gary Walls had to overcome was so much hair coming into the plant that it clogged up the air diffusers in the aerobic digester and digested sludge holding tank. Dan and Gary both had been harbor masters and drew on that experience to come up with an idea to help solve the hair problem. Using old nets from fishing boat, they stretch the netting across the aeration basin to catch the hair. It works great and has cut the amount of hair that gets into the system from nine 5-gallon buckets to only half a bucket. Occasionally, they replace the netting. Just another case of Operator ingenuity at work that saves time and money.

Operators: Please share your creative Trick of the Trade with others. To submit your ideas or solution, contact Max Hildebrand at 503.977.6644 or [mhildebrand@BrwnCald.com](mailto:mhildebrand@BrwnCald.com).

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# What Public Works Professionals Need to Know

*and Nicholas J. Arhontes, Director of Operations and Maintenance, Orange County Sanitation District*

to see his wife staring at him sternly. The ad shows that you can flush almost anything that will get through the Kohler toilet but completely ignores what happens after these "flushable" items get into the sewer.

Tree roots in private laterals can also cause clogs, and in many cases when a plumber clears the obstruction from the lateral, the debris is pushed farther down the line until it reaches the public sewer main. At this point the offending debris becomes the sewer agency's problem.

### What's the Problem?

Ultimately, we as an industry need to specifically identify what products are causing the ragging problem and to identify those products that are labeled or advertised as

being "flushable" but are causing the problems. Some of this research has already been done by the Water Environment Research Foundation (WERF), but more is needed.

To determine the extent of the problem of nondispersible products in the sewer, a survey questionnaire was developed in 2009 by the Southern California Alliance for POTWs (SCAP). SCAP sent the survey to public sewer agencies throughout California requesting documentation of maintenance problems associated with disposing nondispersible products in the sewer system. Agencies were also asked to provide any cost information that they may have been associated with addressing the pump ragging and deragging problem. The results are being tabulated.

### The Future

Here are some possible courses of action agencies might take to mitigate or minimize the problem:

- Agencies and associations can send letters to product manufacturers explaining the problem and requesting that they conduct more aggressive advertising campaigns that emphasize proper disposal options.
- Development of a public outreach program for educating your customers about what items they should not flush down the toilet.
- Writing articles, editorials or essays on blogs, for news papers or public service announcements.
- Dialogue with state legislators leading to possible new

disposal standards for these products.

Depending on the level of staffing and funding available, SCAP has proposed that the investigation and documentation be a combined effort among several professional organizations and public agencies. Funding for such research has not been secured thus far, however possible sources of funding could include:

- Federal/state grants
- National research institutes and policy think tanks
- Federal and state wastewater organizations and networking groups
- Local and regional wastewater agencies
- Product manufacturers/associations
- Environmental groups

## Welcome new members!

New WEF and PNCWA -only members who joined between late November through February: Welcome to all of you! Please let us know how we can best serve your needs and interests and how you would like to be involved.

Gareth Abbott, City of Grand Coulee  
 Skyler Allen, Keller Associates  
 Laurelei Ball, City of Meridian  
 Steve Barnes, City of Moscow WWTP  
 Ann Beier, City of Portland  
 John Bero, City of Tacoma  
 Jacob Boomhouwer, CDM  
 Richard Brewer, TraceDetect Inc  
 Terry Burks, City of Bend Public Works  
 Travis Capson, City of Emmett  
 Nicholas Charles, Keller Associates  
 Krista Chavez, LOTT Alliance  
 Jeremy Coles, City of Rexburg  
 Jeanette Decastro  
 Brian Dobie, City of Shelton  
 Michael Dodd, University of Washington  
 Jeff Elkins, City of Spokane  
 Leonard D. Englund, Lakehaven Utility District  
 Gilbert Flores, Veolia Water NA  
 Ed Gilmore, Water Environment Services  
 Michael Goan, City of Spokane  
 Tiffany Gregg  
 Bob Haberman, Oregon DEQ  
 Ray Hoffman, City of Seattle  
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 Douglas Jacobson, City of Bothell  
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 Ashraf Khalil, Portland BES  
 Aaron Kraft, Veolia Water  
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 Mark Spatz  
 Dwain Strickland  
 Frederic Tower, Treatment Equipment Company  
 Luke Werner, Kennedy/Jenks Consultants  
 Jim Wierson II, ENECON  
 Les Williams, City of Spokane  
 Kyle Woodland, City of Moscow WWTF  
 James Yates

by Nan Cluss, PNCWA Manager

For the staff report at the January in-person PNCWA Board meeting, we did a review of the successes for PNCWA in 2009 and a look forward to 2010. We'd like to share that review here for our members to see:

### In 2009

PNCWA put on our first webinar and it was a great success.

The Public Ed Committee put on another workshop to help communities better inform the public about important water issues. Also, grants totaling \$4,500 were given out for water-related projects to 13 schools in the Adopt-A-School program.

PNCWA had booths at 3 regional science fairs to publicize the materials and learning opportunities available from WEF and PNCWA.

A searchable membership database was made available to members through our new content management system.

The Scholarship Fund was launched and funded.

PNCWA had a strong annual conference in an economically difficult time.

All of our Operators of the Year and Collections System Operators of the Year were in attendance at the conference.

The first ever Past Presidents Breakfast was held at the conference with over a dozen in attendance and each received the new PNCWA Past President lapel pin in appreciation of their service.

A consistent conference branding that will be the identity for our ongoing annual conferences was approved.

We saw heightened interest in student chapters—both existing and newly proposed.

We not only met but exceeded budget expectations.

### In 2010

The redesigned newsletter is in your hands.

There are 8 proposed PNCWA webinars for 2010.

Funds to support emerging student chapters were included in the annual budget and a student chapter was reestablished at the University of Washington.

An Editorial Advisory Group is starting to take shape for the newsletter.

The PNCWA Board is more diverse than ever. In addition to a range in the ages and occupations/affiliations of board members, PNCWA now has 5 women on the 12-person board—an unprecedented number.

Thanks to all involved with any of the above successes or the proposed efforts. We know that everyone is busier than ever but the more people who pitch in to serve the mission of the association in some small or not so small way, the more successes we will see.

Here's to 2010!



Nan Cluss



Michael Rainey

# Tenino, WA

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# 2010 IDAHO WATER REUSE CONFERENCE

## MAY 19 & 20

### BOISE, IDAHO

The annual conference enables representatives of city, county, state and federal agencies, consultants, developers, industry experts, operators and other professionals to network and discuss key issues related to water reuse in Idaho and the West.

**Idaho Department of Environmental Quality**

[www.deq.idaho.gov/2010IdahoWaterReuseConference](http://www.deq.idaho.gov/2010IdahoWaterReuseConference)



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### Day One: Wednesday, May 19, 2010 - Combined Industrial and Municipal Topics

- Wastewater Reuse in Idaho: An Overview .....Rick Huddleston, DEQ Wastewater Program Manager
- Water Reuse Issues..... George Tchobanoglous, Professor Emeritus, U.C. Davis
- Drivers for Reuse: TMDLs.....Dave Clark, HDR
- Legal Issues Panel Discussion: Water Rights Considerations in Reuse Decisions .....IDWR, Givens Pursley and SPF
- Comprehensive Aquifer Management Plan Program.....Helen Harrington, IDWR
- WaterReuse Case Studies.....George Tchobanoglous, Professor Emeritus, U.C. Davis
- Rules/All Classes/ How to do it/Aquifer Recharge.....Mark Mason, DEQ Boise Regional Engineering Manager
- Reuse Guidance.....Mike Murray, HDR
- Groundwater Quality Rule and Significant Degradation.....Barry Burnell, DEQ Water Quality Administrator
- Limits of Technology Nitrates and Aquifer Recharge.....Dave Clark, HDR
- Microbial Risk and Buffer Zones.....Rick Hardy, DEQ Risk Analysis Lead
- Pathogen Infectivity Modeling and Risk Assessment.....Jeff Fromm, DEQ Toxicologist
- Wastewater, Drift, and Determination of Buffer Zones.....Mike Cook, DEQ Soil Scientist
- Water Reuse in Corvallis: Designing a Program the Public Will Support ..Dan Hanthorn, City of Corvallis and Karen DuBose, OSU

### Day Two: Thursday, May 20, 2010 - Track One: Municipal

- City of Meridian City - Wide Class A update.....Tom Barry, City of Meridian and Carl Hipwell, Pharmer Engineering
- Rathdrum Prairie Reuse – Different Rules.....Ken Windram, HARSB and John Tindall, DEQ CDA Regional Engineer
- City of Boise – Is Reuse in Boise’s Future?.....Bob Kresge, City of Boise and Rick Bishop, CH2M Hill
- City of Ketchum – Class A Reuse Planning.....Steve Hanson, City of Ketchum and Brad Bjerke, Forsgren Engineering
- City of Nampa.....Michael Fuss, City of Nampa
- Hidden Springs WWTF, a “Green” System.....Dan Barbeau, Pharmer Eng. and Chris Linder, OMCS

### Day Two: Thursday, May 20, 2010 - Track Two: Industrial

- Irrigation with Reuse: Design, Operation and Drift Considerations.....Howard Niebling, Univ. of Idaho Water Management Engineer
- Winter Application.....John Kirkpatrick, Basic American Foods
- Simplot Aberdeen.....Kelly Packard, J.R. Simplot
- Simplot Caldwell: Sustainable Land Application.....Lance Carter, J.R. Simplot
- Basic American Foods.....Dan Bruner, CES and Bruce Wright, Basic American Foods
- Raft River.....Scott Nichols, U.S. Geothermal
- Idaho Power.....Ryan Adelman, Idaho Power and Jeff Johnson, B&C

Agenda subject to change

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## PUBLIC COMMUNICATIONS CAMP

*Tools to engage, motivate and reassure your community*



**APRIL 9, 2010 • 8:30 - 4:30**

Water Resources Education Center, 4600 SE Columbia Way, Vancouver, WA 98668  
Cost: \$150 members; \$185 Non-members (includes lunch, coffee, snacks). .6 CEU's requested.  
Sponsored by the Pacific Northwest Clean Water Association

**8:00 Registration**

**8:30 Welcome and Introductions**

**8:45 Know and grow your communication style**

Martha Tuttle, Public Involvement Program Manager,  
King County Wastewater Treatment Division

**9:45 Is social media right for you?**

Ely Teragli, Public Information Specialist, Clean Water Services

**10:45 Break**

**11:00 Branding your organization for success**

Amy Kyle, Community Relations Specialist, Clackamas County Water  
Environment Services

**12:00 Lunch**

**12:30 Public meetings SOS**

Sheri Wantland, Public Involvement Coordinator, Clean Water Services

**1:00 Building stewardship one yard at a time**

Gwenn Kubeck, Stormwater Program Specialist, City of Corvallis

**1:30 Stream Team turns 20**

Susie Vanderburg, Environmental Educator, LOTT Alliance

**2:00 Use the media to tell your story**

Brian Barker, Communications Officer, Tualatin Valley Fire & Rescue

**3:00 Break**

**3:15 Solve your public communications challenges**

Presenters and attendees will share their challenges and successes in a facilitated discussion to identify effective strategies, techniques and tools to help their organizations leverage resources and build public support.

**4:15 Wrap Up**

**To register, please visit the PNCWA website at [www.pncwa.org](http://www.pncwa.org)**

## Incentives available for water & wastewater system improvements

Financial incentives may be available if your plans to upgrade your water or wastewater system result in electrical energy efficiency improvements. The Energy Smart Industrial program offers incentives through your local public utility for projects that result in verifiable energy savings.

Experienced wastewater specialists are available to help identify eligible projects, provide project support and answer any questions you may have.



### FOR MORE INFORMATION, PLEASE CONTACT:

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The Energy Smart Industrial program is sponsored by your local public utility and the Bonneville Power Administration.

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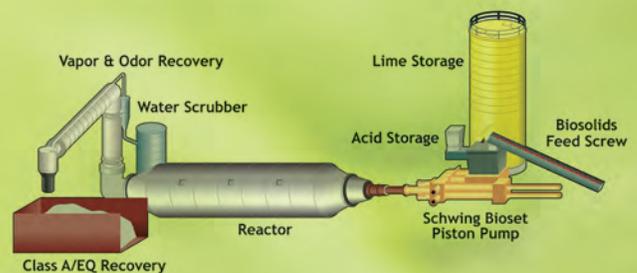


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**BIOSET, reuse to the N<sup>th</sup> degree.**