TRES RIOS
ENVIRONMENTAL RESTORATION PROJECT — PHASE II
IN-PLANT SECONDARY EFFLUENT PUMP STATION (IPSEPS)

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### For a complete list of ADEQ free operator-related trainings, go to page 49 in this newsletter, or log on to their website at www.azdeq.gov.
WATER REUSE AT THE 91ST AVENUE WASTEWATER TREATMENT PLANT

The effluent from the 91st Ave Wastewater Treatment Plant (WWTP) is a valuable resource for a number of water reuse applications including the Arizona Nuclear Power Plant (ANPP), the Buckeye Irrigation District, and the Tres Rios constructed wetlands. These reuse needs are met by delivering the WWTP effluent from the three existing plants – Plant 1, Plant 2, Plant 3 – and two recently constructed unified plants (UP) – UP01 and UP05. The five treatment facilities have capacity to provide an average design effluent flow of 245 MGD. The current configuration allows delivery of effluent from the unified plants to the wetlands, while effluent from the existing plants flows by gravity to the Salt River. The WWTP must maintain the capability to supply as much as 70 MGD of effluent to the ANPP for use as cooling water as well as a minimum of 30 MGD to support the Tres Rios Flow Regulating and Overbank Wetlands.

PLANNING THE CONSOLIDATION OF REUSE WATER DELIVERY

The Tres Rios Environmental Restoration Project Phase II - IPSEPS is funded by the United States Army Corps of Engineers (USACE) Los Angeles District and the City of Phoenix as a local sponsor. American Recovery and Reinvestment Act (ARRA) funds were utilized to support the IPSEPS construction. The IPSEPS will provide flexibility in controlling and delivering the WWTP effluent flows and mitigate emergency conditions that may affect the WWTP’s current ability to discharge the effluent. The IPSEPS plays an important role in the future operations of the WWTP as detailed in the 91st Avenue WWTP Master Plan. It will provide the capability to pump effluent from all five treatment facilities to the wetlands, as well as accommodate future WWTP expansions and potential advanced water treatment facilities such as filtration and ultraviolet disinfection. In addition to controlling effluent flow from the treatment facilities, the WWTP needs to be prepared for emergency conditions including extreme flood events that can prevent secondary effluent from flowing to the Salt River by gravity, loss of electrical power and malfunction of individual components of the pump station. The project was initiated in April 2004 and the IPSEPS is currently under construction and planned to be brought on line by the end of 2011.

The planning phase this project included development of pump station layout alternatives, evaluation of pumping and conveyance equipment alternatives, computational fluid dynamics modeling and analysis of the pump station hydraulics using a physical model of the pump station. Key personnel and firms on the planning and evaluation team included the prime project engineering firm of Damon S. Williams Associates, L.L.C. (DSWA), Robert Sanks, PhD., P.E. of Montana State University; Tom Demlow, P.E. of Northwest Hydraulic Consultants and Charles Ballinger, P.E. of Ballinger Consultants. The limited space designated for the IPSEPS at the WWTP site posed a major challenge to the project. The site constraints and evaluations resulted in the selection of a pump station consisting of vertical mixed flow pumps installed with modified Type 10 formed suction intakes that draw flow off of a tapered approach channel into the pumps. The IPSEPS design targeted a pump station capacity of 300 MGD, with the option to expand the pump station to handle anticipated future flows of 600 MGD. To accommodate future considerations including expansion of WWTP capacity, the layout included two parallel pump stations which could be constructed in phases. The project team analyzed this configuration with computational fluid dynamics and a scaled physical model to identify modifications that would optimize the hydraulics in the approach channel and within the formed suction intakes.
OVERCOMING SCHEDULE, BUDGET AND CONSTRUCTION SEQUENCING CHALLENGES

Due to USACE budgeting and scheduling constraints, the IPSEPS project was put on hold in mid 2005 shortly after the 60% design milestone. In the mean time, the Tres Rios Constructed Wetlands portion of the project proceeded on schedule. In order to provide water to the wetlands, the City of Phoenix initiated construction of the second half of the pump station, designated as the Unified Pump Station (UPS). The UPS was placed in operation in mid 2010. The UPS has a firm capacity of 80 MGD with build out capacity of 300 MGD and consists of effluent conveyance structures connected to the Unified Plants, the pump station structure and pumps, and two forcemains connected to the wetlands. The UPS was completed concurrently with the second Unified Plant (UP05) at the 91st Ave WWTP, which brought the total average daily flow capacity of the WWTP up to 245 MGD and peak hour flow capacity up to 430 MGD. While the UPS is capable of transferring the average daily flow from the Unified Plants to the Tres Rios Wetlands, it did not address all of the objectives of the IPSEPS project including conveying effluent from the existing plants to the wetlands and having sufficient capacity to handle peak secondary effluent flows from all five treatment trains to protect against extreme flood conditions. During construction of the UPS, the US Congress passed the American Recovery and Reinvestment Act, which allowed the USACE and the City of Phoenix to resume the funding of the IPSEPS project.

ACHIEVING EFFLUENT CONVEYANCE GOALS AT THE 91ST AVENUE WWTP

The IPSEPS project consists of three major components including the secondary effluent conveyance system, the pump station, and the effluent forcemains. The effluent conveyance system transports secondary effluent from the existing plants to the pump station by gravity and consists of 84-inch and 96-inch pipelines totaling approximately 6,000 feet in length and three effluent junction structures with automated gates and weirs for flow control. The pump station includes a concrete approach channel and wetwell, two nominal 110 MGD pumps, two nominal 40 MGD pumps, a scum pump station and the IPSEPS electrical building with a standby generator. The pump station discharges to a forcemain system, which includes a third 96-inch pipeline approximately 5,000 feet in length and five concrete forcemain structures that are interconnected on the upstream end with automated gates for flexible control of the UPS and IPSEPS discharge flows. The IPSEPS combined with the UPS increases the secondary effluent pumping capacity at the WWTP to 490 MGD, which is sufficient to convey the peak capacity of all five treatment facilities to the wetlands.

The detailed design team, led by Damon S. Williams Associates, started the IPSEPS project in April 2004. The design team included structural engineering by Nabar, Stanley, Brown; electrical engineering by Jensen Engineering and architectural design by URS. The design team overcame many challenges on this project including the project stakeholders budget and scheduling constraints and coordination with other projects at the WWTP. Budget and scheduling constraints led to the project extending over eight years from design start in 2004 to the anticipated completion of construction in 2011. Other projects at the WWTP site included the UP05A Project (recently constructed Unified Pump Station); the UP05B Project (recently constructed UP05 wastewater treatment facilities); and the APS-COP Meter Vault Project (recently constructed ANPP diversion structure on the UP05B forcemains near the Tres Rios Wetlands).
SPRING HAS FINALLY ARRIVED…. AND WITH IT COMES MANY OPPORTUNITIES FOR AZ WATER MEMBERS!

The 84th Annual AZ Water Conference and Exhibition will be held May 4-6, 2011 at the Glendale Renaissance Hotel and Spa. This year’s conference is slated to be one of the best yet. With presentations and topics including: Water Treatment/Distribution, Odor Control, Reuse, Recharge, Security, Regulatory, Research, Wastewater Treatment/Collection, Biosolids, Construction and “Green” technologies. There is definitely something for everyone at this conference. Be sure to visit the ever popular Exhibition area to network with the many “Industry” related vendor’s and manufacturer’s. See what’s new! Also, don’t forget to stop by and place your bid at the Water for People Silent Auction, they always have some great items available!

Your AZ Water committees have been busy as well. The Tucson and Phoenix Luncheon committees continue to offer very informative monthly presentations on a variety of industry topics. Both the Water and Wastewater committees maintain active schedules for a variety of workshops throughout the state on a large range of topics. Also, this year is the first year for the newly formed Construction committee. This committee is a joint effort between the construction community and AZ Water members to address same interest topics; it will be worth your while to catch at least one of their presentations during the conference. These are just a few of the many committees available for members, and as always I encourage each of you to take advantage of the opportunities all of your AZ Water committees have to offer. Get involved!

I encourage each of you to promote co-workers and associates to join AZ Water and become a part our membership growth. If at all possible try to get someone new to attend this year’s conference so they can see what they are missing.

As always, we will hold the annual election for new Board members during the AZ Water Annual Business meeting on May 5, just following the luncheon program. Please attend and “Vote”. The nominees are also members and they are willing to accept a challenge to play a vital role in the Association’s future. Be sure to let them know how much you appreciate their commitment and remember open dialogue with them is always appreciated, improvements can only be made if the Board is made aware - we value your input!

Here’s to the Association’s continued success and I look forward to meeting new acquaintances and old friends at the 2011 Annual Conference. See you there!

Remember …..“YOU ARE… AZ WATER”.

John WARNER
Pima County
Regional
Wastewater
Reclamation
Department
AZ Water
Association
President
Location: Prescott Valley, AZ  
Date: Wednesday, June 22, 2011  
Time: 8:00 am — 4:00 pm  

The AZ Water Collection Systems Committee is offering an educational workshop designed to assist collection system operators with career and skills enhancement. PDH’s will be available.

TOPICS FOR WORKSHOP INCLUDE: *

- Pipeline Inspection and Condition Assessment
- Collection System Rehabilitation
- Workplace Safety
- Odor Control

* Topics Subject to Substitution

Cost: $50 Members ($65 Non-members); includes Breakfast Lunch and Refreshments.

Location: Hampton Inn & Suites  
2901 N. Glassford Hill Road  
Prescott Valley, AZ 86314  

Register by June 20th online at www.azwater.org or contact:

Michelle Varner  
520-443-6514  
michelle.varner@plma.gov  

OR  

Rita Mercer  
520-443-6536  
rita.mercer@plma.gov
“TOGETHER WE ARE SMARTER. TOGETHER WE ARE STRONGER.” Important statements that the American Water Works Association (AWWA) is stressing. AWWA, AZ Water and similar other organizations exists to help members achieve together what they cannot achieve alone. It’s only through the many voices of their members that AWWA and AZ Water impact public policy in a way that benefits the water community and the public.

At the winter board meeting this past January, AWWA expanded that philosophy beyond its own membership and is making it a priority to develop collaborative relationships with other water organizations. The Board unanimously passed a joint resolution between AWWA and the Water Environment Federation (WEF) as a starting point for the two to work more closely together to advance sound water policy. The joint resolution reads as follows:

WHEREAS; AWWA and WEF understand that a thoughtful, integrated and coordinated approach to the important public health, environmental, financial and societal challenges associated with clean and safe water is in the public interest.

WHEREAS; AWWA and WEF recognize that effective collaboration will advance the science of water and positively influence the development of sound water policy.

WHEREAS; AWWA and WEF acknowledge our responsibility to develop consensus on the major water challenges facing society.

NOW THEREFORE; AWWA and WEF resolve to support and lead as necessary an effort to develop a cohesive voice for the water community by encouraging collaboration between our members, coordinating programs and services, and developing consensus on major water policy issues.

As further support of a collaborative philosophy, recently AWWA Executive Director David La France met with leaders of the Japanese Water Works Association to promote similar alliances spanning international boundaries. AWWA has plans to meet with parallel organizations in other countries as well, including Korea very soon.

For several years AWWA has sponsored a Washington DC “Fly-in” in April. The “Fly-in” is an organized approach to bring water professionals together in our nation’s capitol to speak to policy makers. This year the “Fly-in” will be a joint effort by AWWA and WEF - “Together We are Stronger”. Participants from all over the nation will carry a consistent message representing both organizations. AZ Water will participate again this year and be represented by Mark Stratton as the AWWA Section representative and Brian Biesmeyer on behalf of WEF.

Coincidently, the 2011 annual AWWA conference, ACE11, will be held in Washington DC in June. Last year’s attendance was over 11,800 including 573 international attendees from 54 countries. What a great opportunity to be a voice on policy issues in the headquarters of our government. The voice could be even louder if we could show attendance numbers at 15,000 or 20,000.

ACE11 will feature a technical program with over 550 presentations in 100 separate sessions and several in-depth workshops. The ACE11 Exposition will feature more than 500 exhibitors showcasing the latest products and services available to help ensure safe water. The annual, and always entertaining, Pipe-Tapping Contest, Top Ops Competition, Meter Madness, and the “Best of the Best” Water Taste Test will be held as well.

Before ACE11, remember our AZ Water conference is a great way to participate locally. Meet fellow water professionals and share ideas and see a great exhibitor show. Plan to attend the annual AZ Water conference May 4, 5, and 6 in Glendale, as a warm-up to ACE11. If attending ACE11 is not an option, Craig Woolard, as past president of AWWA, will be at the AZ Water Conference representing AWWA and will share more detail about AWWA activities and new initiatives. Attend the AZ Water Conference and take the opportunity to talk to Craig as well.

See You There!
Great leaders are gathering on the Potomac.

Registration open January 2011

- Visit more than 500 exhibiting companies
- Experience networking opportunities among thousands of water professionals
- Learn from an unparalleled Technical Program

June 12–16, 2011
Washington, D.C.
www.awwa.org/ace11/register2011
I HAVE BEEN FORTUNATE TO SERVE ON THE BOARD OF AZ WATER ASSOCIATION FOR OVER 10 YEARS NOW. For me the time has flown by. Some of you may think this was the longest 10 years you have ever had to endure. The reason I bring up the time is that I saw something happen that I feel is a real quantum leap forward for our organization. We actually took a stand on an important water issue and MADE A DIFFERENCE. One of our Dead (Past) Presidents and the previous WEF Delegate lead this effort.

AZ Water took a stand and supported a water rate increase at the City of Phoenix. As Water Professionals here at AZ Water, this demonstrates that we live one of our key values. It took leadership, it took vision, it took conviction and mostly it took Jim Pembroke. Thanks Jim.

The present economy makes it very difficult to place an additional cost burden on the public. Seven City of Phoenix Council members acted as statesmen. They put the long term public good ahead of their immediate political careers. This is leadership. They have a vision for their community. They know that in our Desert, we have nothing without water. We must jealously guard our water future. We must provide clean safe water for the people we all serve. For Phoenix this was not an easy decision. Phoenix City Council knew what the right thing was and did it.

All of us as part of the Water Industry must communicate the issues we face to the public. We talk to the Public about what we KNOW. If we actually listen to the Public, they tell us how they FEEL. We have to listen to them. Their feelings are important. We cannot just dismiss their feelings because we have more detailed knowledge. As an industry we need their trust. We need their support. We will only earn this trust by listening to them not just telling them.

We are one of the most regulated industries in this Country. We are regulated as to the quality of water we produce for drinking and for the water we treat for reuse or for discharge to the environment. We are regulated by either the government body of which we are a part or by the Corporation Commission as to the rates charged for our products and services. If the public trusts us, the Councils, Boards and Commissions will also.

If we involve the public in our project development and decision making processes, they will have more confidence in our decisions. This is really difficult for us as an industry to do. Apparently, we also have trust issues. We have stayed in the shadows for years. Our feeling was that if we kept our heads down they could not take them off. It is time for our industry to change this approach.

Other public safety and service organizations have provided us a great example of where we need to go in being visible to the public. Fire Departments have a great reputation. The public supports them even though most of them have not had a fire in their house. The public knows their services are important. The public has confidence in them. Have you noticed that the organization that represents the fire fighters actually advertises on TV to generate public support for fire fighters.

Lately I have been seeing TV advertisement by the Central Arizona Project. Salt River Project has been advertising on TV and they now have some great ads on billboards around the Valley. AZ Water needs to step up and put our industry into the public eye in a good way.

Now putting that soap box away, I will turn to our Annual Conference, which is just a month away. Please, make plans to attend. If you are a manager or supervisor this is a great opportunity to get high quality low cost training for your staff. If your people need professional development hours, get them signed up. Don Manthe, your latest Dead President and Conference organizer this year, and the Conference committee have put together a great program and a great conference. It is at the Renaissance Glendale Hotel & Spa, May 4-6, in Glendale again this year.

See you there!
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The Water Environment Federation (WEF) Bioenergy Subcommittee has appointed a new technology Task Force charged with helping inform the wastewater industry at large and, where beneficial to the industry, promoting the growing trend in recovering resources from wastewater streams in the form of Biofuels. The Task Force defines a “Biofuel” as materials created from wastewater treatment byproducts that can be used as an energy source. There are a number of different byproducts of the wastewater treatment process that fall under the umbrella of “Biofuels” and can be categorized into one of the following three main categories: Biogas & Biomethane, Dried Wastewater Solids, and Biodiesel.

The Biofuels Task Force has developed a “State of the Industry” update to provide an overview of emerging trends and identify benefits, challenges, and future pathways of new energy and resource recovery solutions for wastewater treatment byproducts. Engineers, operators, utility managers, and regulators should regard this State of the Industry as an introduction to biofuel production from wastewater treatment byproducts, including Biogas & Biomethane, Dried Wastewater Solids, and Biodiesel. This is not intended to be a comprehensive technical document.

I. BIOGAS & BIOMETHANE

Background

Anaerobic Digestion is used as a solids stabilization process at many Wastewater Treatment Plants (WWTP’s) throughout the United States (U.S.) and Europe, and biogas is a by-product of this process. The biogas consists of approximately 65-percent methane (CH₄), 35-percent carbon dioxide (CO₂), and trace compounds. Biogas is typically utilized on-site at WWTPs in boilers to generate heat for process and building heat, in cogeneration engines to generate electric power, or more recently, in emerging power production processes, such as fuel cells and microturbines. Biogas can also be cleaned to natural gas quality, and the cleaned gas, which is generally referred to as biomethane, can serve as a substitute for natural gas. The biomethane can even be used as a vehicle fuel for compressed natural gas (CNG) or liquid natural gas (LNG) fueled vehicles.

Relevance of Issue

A U.S. Department of Energy study concluded that potential biomethane production from landfills, animal waste lagoons, and WWTP’s is in excess of 10 billion diesel-gallon equivalents. If all of this biomethane were used in vehicles it would reduce greenhouse gases by 500 million metric tons of CO₂ per year, the equivalent of emissions from approximately 90 million gasoline fueled vehicles (NREL). There is growing interest in utilities to utilize this energy resource as a renewable transportation fuel for fleet vehicles, both public and private.

What Has Been Done and What We Know

The cleaning process to generate biomethane involves removal of CO₂, hydrogen sulfide (H₂S), ammonia, water, and other trace compounds in the gas stream in order to increase the methane content to approximately 95-98 percent by volume. The biomethane can then be used as a substitute for natural gas, which allows for direct injection into a natural gas pipeline or use in vehicles fueled by natural gas.

Injecting biomethane into the natural gas supply pipeline within a WWTP enables utilization on-site. An efficient biomethane supply system can be created to supply all existing equipment currently burning natural gas, such as boilers and heaters. This arrangement could potentially limit capital expenses for conversion of the existing equipment to use the more contaminated biogas, and maximize the amount of existing equipment that can use the fuel. Biomethane can also be injected into a natural gas supply pipeline and sold to a utility for use off-site either by industrial, commercial, or residential users. Many European countries, including Sweden, Switzerland, and Germany, have established national standards on pipeline quality gas, but in the U.S. it is more often determined by the utility that owns the distribution pipeline. Some U.S. utilities have expressed concerns over the quality control requirements in order to maintain the quality of the gas they supply their customers.

In Sweden, Switzerland, Austria, Germany and the Netherlands, injection of biomethane into natural gas grids does occur; with a market growing at more than 25-percent annually. In Sweden, Stockholm Water has multiple WWTPs which produce over 7.5 million m³ of biomethane annually.

Biomethane can also be utilized in CNG or LNG fueled vehicles. This process requires additional high pressure compression (3,000 – 5,000 psig) to supply the transfer (filling) stations for vehicles, as well as a fleet or established market of CNG fueled vehicles. This conversion of biomethane to vehicle fuel requires a significant capital investment, but it significantly increases the value of the biomethane.

The use of biomethane as a transportation fuel has the potential for significant CO₂ emission reductions. One study estimated the potential CO₂ emissions reduction between 75 – 200-percent when accounting for the displaced fossil fuels (NSCA). The largest potential reductions could occur if un-captured methane released from WWTP lagoons or landfills is instead captured and utilized for transportation fuel. This would provide a double benefit by reducing methane emissions (significant greenhouse gas contributor) and reducing fossil fuel emissions.

Currently, there is no known U.S. WWTP producing biomethane for use as a transportation fuel, but there are five known privately operating U.S. solid waste landfills that utilize biomethane to fuel their fleets. These five landfill facilities have a total average daily output of approximately 5,000 diesel gallon equivalents (DGE).

In the Swedish town of Kristianstad, over 1.2 million m³ of biomethane is produced from several WWTPs, thus replacing an equivalent of 350,000 DGE of diesel used in public and school buses.
One of the largest and most successful case studies of biomethane utilization is within the Lille France region. A public inter-municipal organization has established the goal of using a 100 percent clean renewable energy public transportation system. The biomethane is produced at several regional organic solid waste and WWTP’s and interconnected to supply public buses. The first gas operated bus was put into service in 1994 and the operation has currently expanded to over 400 biomethane-fueled buses.

What is Not Known and Future Directions

Currently, four different treatment technologies exist for biomethane production; pressure swing absorption (PSA), water scrubbing, membrane separation, and cryogenic separation. There are very few working applications of these processes and the relative effectiveness of each is not well understood. This is particularly true with respect to the required biogas pre-treatment and the overall treatment costs on a per unit basis. The effectiveness of these processes with regards to removal of trace constituents in biogas; hydrogen, ammonia, halocarbons, siloxanes, volatile organic compounds, vinyl chloride, formaldehyde, aldehydes, ketones, and other compounds is also unknown.

More work is required to evaluate vehicle exhaust tailpipe emissions when biomethane is used as a vehicle fuel. Several studies have shown reductions in carbon emissions; however the environmental benefits are highly dependent on feedstock and the treatment technology used to produce biomethane. Overall, the environmental credentials of using biomethane as a vehicle fuel appear to be very strong; however more data and operating experience are required to quantify these benefits for increased market acceptance and adoption. These undefined benefits will be especially important for the operation to receive greenhouse gas emissions reductions or renewable energy generation credits.

The commercialization of utilizing biomethane as a transportation fuel for municipal utilities is ultimately dependent on the ability of the utility to finance the significant capital investment in biomethane production, fuel depot centers, and a biomethane powered fleet. In Europe, the more successful programs for use of biomethane as a transportation fuel have entailed the creation of regional transportation initiatives including multiple cities, public utilities and multiple departments within those utilities. In certain cases public-private partnerships have been created for project financing.

References

II. DRIED WASTEWATER SOLIDS

Background
The production of concentrated streams of particulate organic material is an inherent element of modern wastewater treatment. Residual solids may either be considered as raw (as in the case of primary and waste activated sludge) or as a stabilized product (as in the case of biosolids). Biosolids are a specific designation of wastewater residuals that have attained a level of pathogen and vector attraction reduction that make them amenable for beneficial reuse via land-application. Whether raw or stabilized, a greater than three-quarters of the organic material entering a publicly owned treatment works (POTW) may be handled through solids-side management and treatment processes.

On a mass basis, wastewater solids are produced at a rate of approximately 0.1-0.2 lb (day-capita), resulting in a total production of 7,100,000 dry tons of wastewater solids per year (EPA, 2004). The value of this material as a nutrient-rich fertilizer source has long been acknowledged, and the use of biosolids as agricultural fertilizer accounts for about 55% of all wastewater solids residuals produced in the United States. Recently, beneficial use of wastewater solids has come to not only include biosolids production and land application practices, but also the use of wastewater solids as a fuel source. Various technologies (both mature and novel) are being employed to release the energy locked up in the residual organic fraction of wastewater solids by either combustion or conversion of solids to lighter fuels by physical-chemical processes. These approaches represent a promising diversification of the beneficial end-uses for wastewater solids, in addition to the practice of biosolids land application.

Relevance of Issue
A recent study of the North Toronto Wastewater Treatment Plant (WWTP) found that the raw domestic influent to the plant contains nearly ten times the amount of energy as is required for its treatment (Shizas and Bagley, 2004). Eighty-one percent of this energy was measured to reside in the combined primary and waste-activated sludge streams. If these solids were

continued on page 54
During our 2010 summer vacation, my wife Laurie and I traveled along the Pacific Coast of Oregon and visited several towns along the way. One of the communities we stopped at was Depoe Bay, founded in 1973. A city of approximately 1400 people, Depoe Bay’s main claims to fame are fishing and whale watching.

One day, while enjoying the view of the ocean from behind the protective sea wall – along the Pacific Coast Highway (US Route 101) through downtown Depoe Bay, I noticed the remains of an old gravity sewer pipe – which passed through the wall and proceeded to a discharge point near the present day shore of the Ocean. It has definitely been out of service for many years.

I would surmise that the 8” ID sewer had been built in the 1920’s or before; it was probably financed and built as a “private sewer” by a group of home and property owners who wanted their sewage conveyed away from their homes and land with the goal of never seeing or smelling it again! It was comprised of two foot lengths of smooth wall concrete pipe (bell and spigot joints, mortared joints, no gaskets); positioned in a makeshift trench that had been chiseled out of the surface of a thick layer of fractured basalt rock that formed the shore at that point. After the pipe was positioned in the “trench”, it appears to have been covered (for the most part) with a mixture of mortar and chunks of basalt rock. The pipe has probably been out of service since the early to mid-1970s, when a communitywide collector sewer system and a WWTF were installed in Depoe Bay. As the photos below illustrate, the pipe has definitely deteriorated over time; primarily due to the forces of the Pacific Ocean’s storm wave action. This sewer (i.e., the remains thereof) illustrates the determination of mankind to find ways to get their sanitary wastes away from their homes and businesses in the early years.

As noted earlier, a communitywide sewerage system was installed/activated in the early to mid-1970s. When that sewer system was designed and installed, asbestos cement pipe was used for the gravity mains, a pipe material that the City of Depoe Bay will have to assess/monitor quite closely (and often) in the years to come; especially, with four sewage pumping systems in the City’s sewage conveyance system!
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AZ WATER BOARD NOMINATIONS 2011-2012

The AZ Water Nomination Committee chaired by Steve Davis (5th Past President), presented the following slate of Board officers and directors for the year 2011-2012 for approval by the Board of Directors. The nominees are members in good standing and have agreed to serve if elected. The Board approved the Committee’s recommendation on March 11 during a regularly scheduled Board meeting.

The slate of officers and directors is subject to a vote of the members during AZ Water’s Annual Business Meeting on May 5, 2011 from 1:00-1:30pm at the Renaissance Glendale Hotel, Glendale, AZ. You are encouraged to attend and cast your vote.

AZ Water Officers and Board Members

Officers and Directors
Continuing (not subject to re-election)
President, Kevin Conway
President-elect, Chris Hill
Past President, John Warner
Treasurer, Brandy Kelso
Secretary, Patty Kennedy
WEF Delegate, Paul Kinshella
AWWA Director, Frank Tantone

Continuing (subject to re-election, but serve a minimum of a three-year term)
Director, John Bannen
Director, Chuck Graf
Director, Dan Lueder
Director Manufacturers Rep, Jason Vernon
(elected by the Manufacturer Reps)

New Nominees
Vice President, Teresa Smith-DeHesus
Director, Michelle De Hann
Director, Tom Galeziewski
Director, Mark Martinez
Director, Jacqueline Shaw

Arizona Section of AWWA
Board of Trustees

Officers and National Director
Chair, Kevin Conway
Chair-elect, Chris Hill
Vice Chair, Teresa Smith-DeHesus
Past Chair, John Warner
Treasurer, Brandy Kelso
Secretary, Patty Kennedy
AWWA Director, Frank Tantone

Arizona Member Association
WEF Executive Committee

Officers and National Director
President, Kevin Conway
President-elect, Chris Hill
Vice President, Teresa Smith-DeHesus
Past President, John Warner
Treasurer, Brandy Kelso
Secretary, Patty Kennedy
WEF Delegate, Paul Kinshella

Vice President – Teresa Smith-DeHesus
Teresa Smith-DeHesus is a registered professional civil engineer and a project manager with Black & Veatch. Throughout her 20-year career serving the Arizona water and wastewater industry she has led and managed the study, design and construction phase services for several large water treatment facilities in the Valley including the Gilbert Santan Vista Water Treatment Plant, Chandler Pecos Surface Water Treatment Plant, and Mesa Brown Road Water Treatment Plant. And, she is currently leading the design for the new Mesa Signal Butte Water Treatment Plant. Through this experience she has gained expertise with various combinations of process treatment technologies and chemical treatment facilities. Teresa has also performed many specialized studies and designs for water distribution facilities, complex chemical feed systems, regulatory compliance assignments, and key financial studies for bond issuance and costing for facility planning.

Teresa has served as a director on the AZ Water Board since 2008. Her Association service also includes leadership roles in several committees including past Chair and Liaison of the Technical Luncheon Programs committee and Liaison for the Tap Into Quality and Awards committees. Teresa is also active in the Annual Conference Taskforce and planning for special conference events. She was recognized by the Association in 2009 as an inductee to the Select Society of Sanitary Sludge Shovelers.

Teresa holds a BS in Civil Engineering from Valparaiso University and a Masters of International Management from Thunderbird School of International Business. She is a past president of the Phoenix Chapter of the Thunderbird Alumni Association. Teresa is also an active volunteer in the community for the Irish Cultural and Learning Foundation and the American Cancer Society.

Director – Michelle De Hann
Michelle De Haan has served the water industry for eighteen years. She is passionate about ensuring safe drinking water, and supporting the organizations that share the same goals. At the beginning of her career she managed the City of Scottsdale Drinking Water Program. For the last ten years she has supported Southwest water systems, as a consulting scientist, with the past two years at Water Works Engineers. She has been actively involved in AZ Water her entire career, more notably over the last 10 years. Her AZ Water involvement encompasses many years of actively participating in the Annual Conference Task Force Planning committee; the Water Treatment committee and the associated Annual Water Treatment Workshop; the Water Research committee; and the 2011 AWWA Host committee for the AWWA Water Quality Technology Conference in Phoenix. She has been a speaker numerous times for the AZ Water Annual Conference, TriState and the Rural Water Association of Arizona Conference.

On the national level she is serving as chair of the AWWA Inorganic Contaminant Research committee. She recognizes the benefit of being directly involved, and maintaining a pulse on the EPA’s regulatory activities, where she actively represents Arizona and southwestern states. She is a nationally recognized drinking water specialist focusing on inorganic and organic contaminant removal, water quality evaluations, DBP control and overall EPA Safe Drinking Water Act (SDWA) regulatory compliance. An active member of AWWA, WaterRF, AZ Water, and the Western Coalition of Arid States (WESTCAS), Michelle has spent her entire career engaged in local, regional and national drinking water stakeholder activities, drinking water treatment technology research and overseeing design of these technologies. She has been integral in representing the southwest’s interests for many rulemakings most notably the arsenic, consumer confidence reports, radionuclides, radon, and more recently fluoride, chromium VI and perchlorate. She is dedicated to serving AZ Water, AWWA, and the water consumers of Arizona.

Director – Thomas M. Galeziewski
Last year’s Engineer of the Year award recipient has over 30 years of experience in the water industry. His experience includes pipeline and pump station analysis and design, water treatment, pilot studies, water quality evaluation studies, sewer assessment and rehabilitation, lift station and forcemain design, and even solid waste. He is known for his professional

continued on page 18
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commitment to quality. This commitment extends to his continual efforts to train the next generation. Many times you can find him in his office giving guidance to younger engineers and sometimes even “seasoned” managers on design issues, alternative evaluations, and general career guidance. He leads by example and those around him flock to him for guidance and support knowing that they will get the best advice available. He has expanded the knowledge of many individuals through his mentoring, training, and committee leadership roles.

Tom is a Past President of the Arizona Section of the American Society of Engineers, an active member of the American Public Works Association, a member of the American Water Works Association Inorganics Contaminants committee, and a member of the Water Environment Federation. As an AZ Water member, he has served as the Water Treatment committee chair and is an active member of several committees.

Tom has a B.S. in Civil Engineering from the University of Notre Dame, and completed graduate studies in Environmental Engineering at the University of California Davis. He is a registered engineer in both Arizona and California. Currently, he is a Senior Professional Associate and Vice President with HDR Engineering.

Environmental Engineering from the University of Arizona. She currently works in the Water Treatment Planning and Process Group in the Phoenix office. As an Arizona native, Jacqueline is pleased to be working to address local water issues. Her experience has primarily focused on drinking water treatment projects, including process optimization studies, bench-scale testing, full-scale testing, and master planning. Specifically, she has experience with arsenic treatment residuals, disinfection by-product formation and control, and pre-oxidation with chlorine dioxide.

Jacqueline first became involved with AZ Water as a student. Through her presentation at an AZ Water Annual Conference, she made contacts that led to her employment in the water industry. Since that time, she has served as Chair of the Young Professionals committee, where she remains an active committee member. Jacqueline is also a member of the AZ Water Finance committee and the American Water Works Association.

crossword

BY LANCE MASON, BROWN AND CALDWELL

ACROSS
1  It can be quick or used in softening (4)
3  A unit of bacteriological analysis (3)
4  Another term for filtered water (8)
5  Chlorine piping should be this color (6)
7  This dissolved compound can form H2S in the headworks (7)
10  Once a free chlorine residual is achieved you have surpassed this (10)
11  5,000 milligrams is this many grams (4)
13  Nitrifiers are classified as this type of organism (9)
16  The energy contained in moving water (7)
18  Another term for aluminum sulfate (4)
20  An organism that can respire aerobically and anaerobically (11)
22  The “N” in TKN (8)
23  This chamber slows velocity to allow heavier inorganics to settle out (4)
24  Two compounds produced in aerobic respiration are CO2 and _______ (5)
25  The color of the gas produced in mixing chlorine gas and ammonia (5)

DOWN
2  1/1000 of a gram (9)
3  The liquid removed from sludge in a centrifuge (8)
4  The rate at which water flows through RO or MBR membranes (4)
6  Fresh water with salt water influence (8)
7  Solids Overflow Rate (3)
8  This anaerobic reaction produces volatile fatty acids (12)
9  4,000 liters is this many kiloliters (4)
10  A cycle in filtration to clean the media (8)
12  Dechlorination chemical sodium _______ (9)
13  Nitrification consumes this (10)
14  The common APP limit for total nitrogen in BNR plants (3)
15  Hypochlorous acid (4)
17  Mineral with chemical symbol Cl-- (8)
19  Water that comes from showers, sinks, and washers (4)
21  This oxygen demand test inhibits nitrifiers (4)

SEE ANSWERS ON PAGE 25
ATTENTION ARIZONA WATER CONFERENCE ATTENDEES

PEPCON SYSTEMS, A Division of AMERICAN PACIFIC CORPORATION

ANSI / NSF STANDARD 61 CERTIFICATION of a new on-site sodium hypochlorite generator

PRODUCT DETAILS

PEPCON SYSTEMS announces the recent ANSI/NSF Standard 61 Certification of their NEW ChlorMaster® BP III, on-site hypochlorite generator, (OSG) The BP III, bipolar electrochemical cell utilizes a compact titanium anode/cathode design that results in high current efficiency and low energy consumption.

BP III cells are lightweight and can be removed and serviced by a single maintenance professional. 500 lbs./day equivalent chlorine can be achieved from a 36”x 50” x 72”H module. Larger capacities, up to 30,000 lbs./day are configured using multiple module systems. Acrylic BP III cells are translucent and provide for convenient observation and monitoring.

SYSTEM BENEFITS AND FEATURES

On-site sodium hypochlorite generators (OSG) provide a continuous source of chlorine while eliminating many safe-handling issues generally associated with chlorine gas systems. The PEPCON ChlorMaster® BP III produces a 0.8% strength chlorine solution. Compared to high strength solutions, low strength sodium hypochlorite is less affected by temperature changes and helps to suppress unwanted bi-product formation.

PEPCON SYSTEMS is a division of American Pacific Corporation (AMPAC) NASDAQ symbol APFC and is located in Cedar City, Utah. The division has been providing disinfection and odor control systems to industrial and municipal markets for more than 40 years. Over 400 installations worldwide and is ISO 9001:2008, ISO:14001, and OHSAS:18001 certified.
THE PIPELINE
Operator Certification Challenge
SEE ANSWERS ON PAGE 64

WATER TREATMENT GRADES 1 & 2
1. Which of the following disinfectants of drinking water has residuals normally measured using total DPD?
   A. Chlorine Dioxide
   B. Chlorine
   C. Ozone
   D. Chloramines

2. How many cubic feet (Cu. Ft.) may be contained in a basin that measures 100 feet long, 35 feet wide, and is 13 feet deep?
   A. 82,250 Cu. Ft.
   C. 45,500 Cu. Ft.
   D. 30,000 Cu. Ft.

3. How many gallons (Gal.) of 48% aluminum sulfate (alum) solution weighing 11.1 pounds per gallon are fed in a 30 day month if the alum dosage is 8.5 mg/L and the average water production is 2.5 million gallons per day?
   A. 125 Gal
   B. 250 Gal
   C. 500 Gal
   D. 1000 Gal

4. If a treatment plant produces 20,000 gallons of sludge per day, how many days will it take to fill a drying bed measuring 200 feet square to a depth of one foot?
   A. 10 Days
   B. 15 Days
   C. 20 Days
   D. 30 Days

5. What are the most common ions contributing to hardness in water?
   A. Calcium and Manganese
   B. Iron and Manganese
   C. Sodium and Chloride
   D. Fluoride and Trihalomethanes

WATER TREATMENT GRADES 3 AND 4
1. What does CT mean to a water treatment professional in Arizona?
   A. California Time for PDH’s.
   B. Contact Time allowed for ADEQ certification renewal.
   C. Contact Time of disinfectants in water.
   D. Concentration multiplied by contact time of disinfectants in water.

2. If a treated water sample is found to have a Langelier Index of +1.0, what may happen to metals in contact with this water?
   A. Severe corrosion.
   B. Corrosion only of iron.
   C. Nothing, the water is neutral.
   D. Deposition of calcium carbonates.

3. What is the number of pounds of pure alum per gallon (lbs/gal) in a 48% solution with a specific gravity of 1.32?
   A. 5.28 lbs/gal
   B. 7.25 lbs/gal
   C. 8.34 lbs/gal
   D. 9.99 lbs/gal

4. What is the backwash rate in gallons per minute per square foot (gpmpsf) if 10 MGD backwash flow rate flows through a filter that measures 18 feet by 15 feet in area?
   A. 18 gpmpsf
   B. 26 gpmpsf
   C. 31 gpmpsf
   D. 41 gpmpsf

5. A water treatment plant practices ozonation. Which of the following processes may be impacted when using ozone?
   A. Disinfection
   B. Coagulation
   C. Taste and Odor Removal
   D. All the above.

WATER DISTRIBUTION GRADES 1 & 2
1. Which of the following types of meters are most frequently utilized as customer service meters?
   A. Nutating disk meter
   B. Compound meter
   C. Venturi meter
   D. Propeller meter

2. How many Million Gallons (MG) in a reservoir that is 80 feet in diameter and the water depth is 27 feet?
   A. 0.8 MG
   B. 1.0 MG
   C. 2.7 MG
   D. 8.0 MG

3. How many Million Gallons (MG) in a reservoir that is 45 feet in diameter and can hold 20 feet of water if the well supplying it pumps 1000 Gallons per Minute?
   A. 4.0 hours
   B. 4.3 hours
   C. 5.2 hours
   D. 6.0 hours

WATER DISTRIBUTION GRADES 3 & 4
1. How many pounds per gallon (ppg) of active chlorine in a sodium hypochlorite solution that is 12.5% active chlorine and weighs 10.5 pounds per gallon?
   A. 1.0 ppg
   B. 1.25 ppg
   C. 1.3 ppg
   D. 10.5 ppg

2. What is the MCL for Arsenic in a distribution system?
   A. 0.010 mg/L
   B. 0.050 mg/L
   C. 0.100 mg/L
   D. 1.00 mg/L

3. If a sample tests positive for Fecal Coliform bacteriological analysis, what must be done?
   A. Repeat the sample.
   B. Notify the State.
   C. Notify the public.
   D. Both B and C.

4. A water treatment plant practices ozonation. Which of the following processes may be impacted when using ozone?
   A. Disinfection
   B. Coagulation
   C. Taste and Odor Removal
   D. All the above.
5. What is a water system’s usage of water in Acre-Feet per year (AF/Y) if the average daily usage is 5.2 MGD?
   A. 5.2 AF/Y
   B. 365 AF/Y
   C. 1898 AF/Y
   D. 5825 AF/Y

WASTEWATER COLLECTION GRADES 1 & 2
1. Operation and Maintenance of a Wastewater Collection System may be viewed as not letting wastewater overflow onto streets or into homes.
   A. True   B. False

2. Which of the following fits the definition of a confined space?
   A. It is large enough to enter and perform assigned work.
   B. It has limited means for entry or exit.
   C. It is not designed for continuous operator occupancy.
   D. All the above.

3. If an orange floats between manholes 200 feet apart in 6 minutes and 40 seconds, what is the velocity in feet per second?
   A. 0.5 feet per second
   B. 1.0 feet per second
   C. 2.0 feet per second
   D. 4.0 feet per second

4. What is the angle of a pipe as compared to horizontal?
   A. Angle of repose
   B. Deviation
   C. Invert elevation
   D. Slope

5. Wastewater is flowing through a full 24-inch force main at 10 Cubic Feet per Second (CFS). What is the velocity in Feet per Second (FPS) of the wastewater?
   A. 1.5 FPS
   B. 3.2 FPS
   C. 4.5 FPS
   D. 6.6 FPS

WASTEWATER COLLECTION GRADES 3 & 4
1. The type of pump normally used to lift wastewater in wastewater collection lift stations are:
   A. Centrifugal pumps.
   B. Metering pumps.
   C. Piston pumps.
   D. Peristaltic pumps.

2. What is the production in Gallons Per Minute (GPM) of a pump that can lower a well wet measuring 8 feet in diameter 12 feet in 3 minutes?
   A. 1000 GPM
   B. 1500 GPM
   C. 2060 GPM
   D. 2267 GPM

3. A 2-foot diameter wastewater line (requiring 3 foot wide trench) must be buried an average of 18 feet below grade. How many cubic yards of earth must be removed to bury 300 feet of the line? Assume shoring will be used to maintain trench wall integrity.
   A. 180 cubic yards
   B. 300 cubic yards
   C. 505 cubic yards
   D. 600 cubic yards

4. If the velocity of wastewater through a section of collection main is less than 1.0 foot per second, what may happen?
   A. Excessive infiltration
   B. Scouring of the main
   C. Corrosion due to Hydrogen Sulfide
   D. Settling of solids

5. When an operator’s work is exceptionally good, the operator:
   A. Could be assigned more complex work.
   B. Deserves reward or recognition for the work.
   C. Is held responsible and penalized.
   D. Should be assigned additional work.

WASTEWATER TREATMENT GRADES 1 & 2
1. Normal velocities of wastewater flowing through grit chambers is 0.7 to 1.4 feet per second.
   A. True   B. False

2. Which of the following substances in wastewater are removed or reduced in primary clarifiers?
   A. Alkalinity
   B. Settleable Solids
   C. Biochemical Oxygen Demand
   D. Both B and C.

3. What is the capacity of a basin in Gallons that is 45 feet in diameter and holds 15 feet of wastewater?
   A. 155325 gal
   B. 178400 gal
   C. 233000 gal
   D. 450000 gal

4. What is the surface loading in gallons per day per square foot (GPDP) of a sedimentation basin that is 75 feet in diameter, 18 feet deep, and treating 4.4 MGD?
   A. 540 GPDP
   B. 750 GPDP
   C. 996 GPDP
   D. 1750 GPDP

5. What is the chlorine demand in a wastewater treatment plant if 8.75 mg/L chlorine is dosed and at the end of the chlorine contact chamber there is a residual of 2.5 mg/L?
   A. 2.5 mg/L
   B. 5.00 mg/L
   C. 6.25 mg/L
   D. 8.75 mg/L

WASTEWATER TREATMENT GRADES 3 & 4
1. Rising sludge is a problem that occurs in secondary clarifiers.
   A. True   B. False

2. What is the Biochemical Oxygen Demand (BOD) loading to a wastewater treatment plant in pounds per day (ppd) when the influent BOD is 300 mg/L and the volume treated is 8.5 MGD?
   A. 21,267 ppd
   B. 24,000 ppd
   C. 32,500 ppd
   D. 65,000 ppd

3. What is the removal efficiency of a basin with a flow of 8.34 MGD, an influent BOD of 475 mg/L, and an effluent BOD of 125 mg/L?
   A. 20%
   B. 52%
   C. 74%
   D. 96%

4. What is the organic loading to an anaerobic digester if 2,400 gallons of sludge are pumped to the digester that contain 8% solids of which 72% are volatile solids?
   A. 720 pounds per day.
   B. 800 pounds per day.
   C. 1152 pounds per day.
   D. 1601 pounds per day.

5. A trickling filter that measures 85 feet in diameter has an influent BOD of 248 mg/L and treats 15.0 MGD. What is the surface loading in pounds per day per square foot (ppdpsf)?
   A. 5.5 ppdpsf
   B. 8.5 ppdpsf
   C. 9.5 ppdpsf
   D. 9.9 ppdpsf

BY TED BAILEY
BAILEYTB@ATT.NET
SAVE THE DATE!!!

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SCOTTSDALE (March 30) — TUCSON (April 14) — COTTONWOOD (June 8)

Water Industry Professionals Will Share Information on the Following Relevant Topics:
• Distribution System Aquifer Storage and Recovery Operations in the City of Phoenix
• Maintaining Distribution System Contamination Warning Systems
• Managing Distribution System Water Quality
• Water Distribution System Upgrades for Why, AZ
• Lost and Unaccounted for Water in Distribution Systems
• Well Pump Station 101
• DBP Mitigation Measures in the Distribution System

Registration cost is $55/person and includes:
• 6 PDH’s
• Continental breakfast and lunch
• Important information relevant to distribution system operations
• Great networking opportunity

To register, or for more information,
go to www.azwater.org and click on “Calendar and Events”
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ADEQ COULD PAY FOR YOU TO ATTEND!

To receive this reimbursement under the ERG Grant, an Operator must be both:
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FOR
WATER AND WASTEWATER
REGISTRATION FORM
6 PDH’s - ADEQ APPROVED

WORKSHOP DETAILS
The Workshop will Include 6 Presentations Focusing on Relevant Distribution System Topics

<table>
<thead>
<tr>
<th>DATES</th>
<th>LOCATION</th>
<th>TIME</th>
</tr>
</thead>
<tbody>
<tr>
<td>March 30</td>
<td>Scottsdale Center for the Performing Arts Scottsdale, AZ</td>
<td>8am - 4pm</td>
</tr>
<tr>
<td>April 14</td>
<td>Pima Community College Tucson, AZ</td>
<td>8am - 4pm</td>
</tr>
<tr>
<td>June 8</td>
<td>Cottonwood Public Safety Conference Room Cottonwood, AZ</td>
<td>8am - 4pm</td>
</tr>
</tbody>
</table>

COST:
$55.00 Per Person (Includes Morning Refreshments and Box Lunch)
Space is Limited – Registration Begins January 1, 2011

PAYMENT, REGISTRATION & QUESTIONS

REGISTER ONLINE AT: OR MAIL OR FAX REGISTRATION TO:
www.azwater.org Cindy Martinez Phone: (520) 877-1125
6265 N La Canada Dr. Fax: (520) 575-8454
Tucson, AZ 85704 Cindy.Martinez@metrowater.com

I/We will attend the ____________________________ workshop. Payment of $________________ is enclosed.

Payment method (circle one) – Master Card Visa Money Order Check

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Name on Card: ____________________________ (Make Checks Payable to AZ Water)  

1. Registrant Name ____________________________ E-Mail ____________________________

2. Registrant Name ____________________________ E-Mail ____________________________

Company Name: __________________________________ Phone #: ____________________________

Mailing Address: ________________________________________________________________
I recently heard a presentation from a speaker named Paul Tsika about how “Time Matters”. I would like to share some of his thoughts with you on how we think about time.

President Garfield was overseeing a school and a student came to him with a complaint about the course work being too hard. The student wanted the standards to be reduced so he did not have to work so hard for success. President Garfield advised the student that growth takes a long time and is sometimes harder than one thinks it should be. He advised that it takes many years to grow an oak tree but only a few days to grow a weed. The oak tree, when grown, will withstand the adversity of storm and famine, while the weed is gone as soon as there is any adversity from the ideal growing conditions. Many times our lives are like the oak tree vs. the weed.

Time Matters, it takes time to grow:
- an oak tree
- a great character
- a great marriage
- a great relationship with a friend or associate
- a great business

Anything worth doing in life takes time! Nothing is going to happen overnight. Even an overnight success normally takes a lifetime to develop and then at some point in time, it all comes together and everyone on the outside says that was luck or he is an overnight success.

We each have 24 hours per day. The Wall Street Journal had an article that said, “No man lacks time, no man lacks money, what they lack is MANAGEMENT.” It is how we manage what we have that makes the difference. The person on the street has the same amount of time as the most successful business man. How is it that some people get so much done, when others have little to show for their day? Have you ever come to the end of the day and felt that you have so much to do, but failed to get much done? Could it be that you nibbled away at things without focusing and getting anything completed?

Have you ever noticed that some people say more and more about less and less and end up saying nothing at all? We each have a responsibility to manage our time and keep our commitments, to ourselves, our families, and the organizations that we work within.

Here is a Proven Plan that is not new, but works every time:
- If you have things to do, list them in a priority from the highest priority to the lowest. Do not make the list too long or you will lose confidence.
- Do not do anything on the list but the highest priority item. If you are tempted to go to a lower priority item before you complete the highest priority item STOP and get back on track until you complete the highest priority item.
- The mere fact that you have completed an item will provide you with a burst of energy and give you a great sense of accomplishment. The alternative is that you go from item to item and have no completion and gain not sense of satisfaction or completion.

Time is a little slice of eternity on the golden platter of opportunity.

We each need to learn to make the most of our time, so that we can grow in wisdom. If you must kill time, work it to death.

Take time to Think - It’s a source of power
Take time to Play - It’s the secret of perpetual youth
Take time to Read - It’s the fountain of wisdom
Take time to Pray - It’s the greatest power on earth
Take time to Love and Be Loved - It’s a God given privilege
Take time to be Friendly - It’s the road to happiness
Take time to Laugh - It’s the music of the soul
Take time to Give - It’s too short a day to be selfish
Take time to Work - It’s the price of success

Why do some succeed and others do not succeed? One thing you can learn by the Clock, is that it passes time by keeping its hands busy!

The difference in successful people has been said to be that they “Plan their work and work their plan”, because time matters. If you do not manage time it will manage you! Our days are like suite cases; some are packed better than others and have more in them.

So what does your daily routine, your week, your month, and your calendar look like? Line out your plan for the day and work your plan, and you will feel good and not frustrated about your day and your accomplishments.

It has been said that “There is never enough time to do it right, but there is always enough time to do it over!”
Time is a versatile performer:

- It flies
- It marches on
- It heals all wounds
- It runs out
- It will TELL

Time tells no lies, what will Time tell about you tomorrow? Will it say that you did nothing or will it say that you managed your time and accomplished your goals?

Even if you did not get all your tasks completed that were on your list, you will have accomplished more if you manage your time, because “TIME MATTERS”.

My hope is that this issue of Success and Fun will help each one of us change the way we think and act in our daily lives. I am honored to share my perspective on “SUCCESS and FUN”. I hope to hear from you, contact me at phendricks@cox.net if I can be of assistance to you.

TRIVIA QUESTIONS

(FROM THE OFFICE OF THE AZ WATER ASSOCIATION HISTORIAN)

A. Year and place Frank Winfield Woolworth opened the first five-cent (not “dime”) store?

B. Date Christopher Columbus first sited land on his adventure to find a western ocean route to Asia?

C. First person to “ride” down and over (not plunge over) the Niagara Falls?

D. When was the construction of the Gateway Arch in St. Louis, MO finished?

E. Date of the radio broadcast of the “War of the Worlds” tale?

SEE ANSWERS ON PAGE 37
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At the March 10, 2011 Board Meeting a presentation was given by Jeff Prevatt, Program Manager of the Compliance and Regulatory Affairs Office (CRAO) with Pima County Regional Wastewater Reclamation Department, relative to the success of partnering with the Oro Valley Optimists Club.

For the past decade Pima County Regional Wastewater Reclamation Department (PCRWRD) has been monitoring and watching the regulatory community in the analysis of Endocrine Disruptors (residual pharmaceutical levels within groundwater). Although the concern warrants attention, the investment for removal is unknown at this present time. PCRWRD chose to become proactive in a program that could diminish environmental impacts of the disposal of pharmaceuticals by both flushing down the drain and depositing within landfills.

A few years ago the PCRWRD created a comprehensive program designed to educate Arizona’s citizens about the harmful effects of flushing unused medications down the drains and to address the potentially lethal effects of prescription drug abuse amongst teens. What has evolved is an enormously effective program that we call Dispose-A-Med and is geared towards both the education and the removal of unwanted medications from within the home.

Unlike other take back programs, Dispose-A-Med is a regional program that incorporates the greater Pima County region and is represented by member agencies from cities and towns including Tucson, Marana, Oro Valley, Green Valley, Sahuarita, the University of Arizona, Pinal County and the Pascua Yaqui and Tohono O’odham Indian Nations. We are happy to boast membership from multiple agencies including local law enforcement, fire departments, pharmacies, poison control, schools, and enjoy a very effective working relationship with DEA.

However, the Dispose-A-Med program would not be the success it is today if it were not for the undying efforts and consistent involvement of the Oro Valley Optimists. Through the active involvement at monthly collections and stakeholder meetings, the Oro Valley Optimists have become synonymous with the Dispose-A-Med program and continue to recruit fellow Optimists throughout greater Tucson and even Pinal County.

We applaud the efforts of the Dispose-A-Med program and the Oro Valley Optimists and hope they will encourage Optimists nationally to join this widely recognized approach to removing unused medicines from our environment and thereby protecting our nation’s water resources. In doing so, the AZ Water Association Board has shown our support of these efforts by submitting a letter of support and anticipates that this will become a small part of this growing and successful program.
RECOGNIZING OPERATORS AS GUARDIANS OF PUBLIC HEALTH

Not only water professionals believe the advent of basic wastewater collection and treatment in the 20th century resulted in direct benefits to public health in the United States and other developed countries. In 2007, thousands of readers of the prestigious British Medical Journal picked sanitation, or wastewater collection and treatment, as “the most important medical advance since 1840.”

That’s right; sanitation was chosen by medical professionals as the most important medical advancement during the past 100 years instead of anesthetics, antibiotics, and countless other Nobel Prize-winning advances.

Taking this vital public health service for granted is easy, especially when all you have to do is turn on the tap to get clean, safe water or flush a toilet to safely dispose of your wastes. Yet 2.5 billion people — nearly 40% of the world’s population — still lack access to clean, safe water and basic sanitation, resulting in thousands of children’s deaths every day. And the recent outbreak of cholera in Haiti that caused more than 1,000 deaths provides another reminder of the dangers of poor sanitation.

Wastewater collection and treatment systems can be one of a community’s most valuable publicly owned assets, but often they are its most underappreciated assets, with out-of-sight, out-of-mind buried infrastructure. Personnel operating and maintaining these valuable and vital public assets should be recognized as custodians of public health.

THE IMPORTANCE OF INFRASTRUCTURE AND OPERATORS

The Water Environment Federation (WEF) has programs, such as Water is Life and Infrastructure Makes it Happen™, that are designed to help improve public understanding of the vital role played by well-functioning water infrastructure in maintaining public and economic health, as well as quality of life. And Work for Water, a joint program with the American Water Works Association (AWWA; Denver), emphasizes individual careers and functions vital to ensuring the availability of this essential public service.

WEF provides training materials, including books, study guides, trainers’ kits, and online courses, for operators to use to prepare for certification or to meet continuing education requirements. WEF also provides operators with access to educational workshops at WEFTEC®. WEF Member Associations (MAs) step in to provide more face-to-face training for operators, and many are involved in certification, especially for voluntary certification programs, such as those for collection systems or laboratory personnel.

EXCITING DEVELOPMENTS

During the many years that I have been involved in WEF, there have been discussions suggesting that the organization should do more to support and develop the capabilities of operators and to increase visibility of operators as frontline public health professionals. But these discussions have not resulted in a clear indication of what WEF can do to make a more effective contribution in this area.

Recently, WEF has taken steps to increase understanding of the needs of operational professionals now and into the future and how WEF can better meet those needs, moving from understanding to action. This multilevel effort involves the WEF Board of Trustees, House of Delegates, committees, and MAs. Any action will be in close collaboration with the MAs and other key players, including utilities and other water-sector organizations, the U.S. Environmental Protection Agency (EPA), and certification stakeholders, such as the Association of Boards of Certification (ABC; Ankeny, Iowa). It has been exciting to be a part of this WEFwide initiative.

WEF INCREASES UNDERSTANDING OF OPERATORS’ NEEDS

WEF conducted a survey that has generated feedback from more than 900 respondents who work at utilities, including plant operators (43%), administrative and management staff (20%), laboratory analysts (8%), collection systems operators (more than 10%), and other professionals, including maintenance, biosolids, pretreatment, and compliance specialist professionals (19%). The survey provided information on requirements for certification, continuing education, training preferences (with face-to-face training still preferred over self-study via manuals or the Web), and participation in WEF, as well as other associations.

Also, WEF is working with its MAs to build a matrix of information on state certification and training requirements, trends, and challenges. MAs face increasing needs for operator training, in some cases because state budget cuts are reducing support for training institutions and personnel. Some of the indications from discussions between WEF and MA leaders at WEFTEC provided the following feedback:

- Reviewing fact-based information on the differences in certification and training requirements in each state and province is important.
- A consensus seems to be emerging that reciprocity is a problem and that developing a “national” agreement on certification and training standards might be helpful in addressing this issue.
- There is broad agreement that there is a need to elevate the professional image of operators.

continued on page 37
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Red Carpet Silent Auction

AZ Water Annual Conference
Glendale Renaissance Hotel & Spa
May 4-5, 2011
Water For People is Proud to Announce the 6th Annual Exhibitor Silent Auction at the AZ Water Annual Conference & Exhibition

Each year’s event is a lot of fun and raises funds for Water For People! We hope to make each year’s auction bigger and better than the last and to do so…

We need YOUR help! Please participate in Water For People’s Exhibitor Silent Auction by donating an auction item or displaying one in your booth. Attendees will place bids at your booth in hopes of being the highest bidder. All proceeds will support Water For People.

The auction will begin on Wednesday, May 4th at 10:30 am within the Exhibit Hall (Media Center) at the Renaissance Glendale Hotel. The silent auction will close at 11:00 a.m. on Thursday, May 5th.

This is a great opportunity to encourage attendees to visit your booth and to raise funds for one of humanity’s greatest causes: clean water. For the past twenty years Water For People has been working alongside communities in need, empowering them to implement water and sanitation systems and assisting them in achieving this goal.

If you are interested in having an item displayed at your booth, and/or would like to donate an item to the silent auction, please contact Levi Dillon, Water For People committee chair, at 602-474-4117 or ldillon@carollo.com.

Thank you!

For more information about the AZ Water Association’s Water For People Committee, visit www.arizonawaterforpeople.org
YOUNG PROFESSIONALS

RECENT EVENTS

2010-11 Future City Competition

Members of the AZ Water Association Young Professionals Committee took part in judging this year’s Future City Competition held at the Burton Barr Central Library and the Phoenix Preparatory Academy in January. The Future City Competition is a contest where teams of elementary and middle school students develop a city in the future applying engineering concepts through practical applications of math and science. The competition required the teams to construct a scaled model of their future city along with a computer simulation and an essay. The teams are judged based on their ability to take into account the various social and municipal needs of the future populace of their city.

On Wednesday, January 19, 2011, Jeanne Jensen, Lisa Clifton, Gretchen Hawkins, Sarah Gurule, Jacqueline Shaw, Jennifer Miller and Neil Woodroffe had the difficult task of evaluating over 100 outstanding models and essays at the Burton Barr Central Library and narrow them down to a few potential winners of the AZ Water Association’s sponsored award. On Saturday, January 23, 2011, Neil was joined by Anh Quach, Venkat Radhakrishnan, and Laurel Passantino at Phoenix Preparatory Academy to select the winner. After listening to many excellent presentations, Team Quarna from Our Lady of Perpetual Help Catholic School was selected as the winner of the AZ Water Association’s award for Best Use of Water and Environmental Resources. Congratulations, Team Quarna!

If you are interested in judging next year’s event, check the website in December for details on next year’s Future City Competition.

2011 Engineers Day at the Arizona Science Center

The Young Professionals Committee participated in 2011 Engineering Day at the Arizona Science Center. On February 26th, YP Committee members volunteered their efforts for the 8th consecutive year by interacting with kids and parents to help determine the identity of several “mystery” liquids by using pH testing paper. The liquids that were identified with the pH paper were determined to be soda, vinegar, laundry detergent, baking soda and drinking water. Our volunteers: Jeanne Jensen, Sean Dupuis, Manika Gupta, Jacqueline Shaw, Laurel Passantino and Neil Woodroffe took part in Engineers Day and enjoyed educating all-ages of children.

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about the acidity of various liquids that we use or consume every day. Participants were also given sample pH testing paper to take home for testing the pH of other common household liquids.

UPCOMING EVENTS

Call For Judges: Regional Science Fairs, Stockholm Junior Water Prize

Stockholm Junior Water Prize (SJWP) regional award certificates recognize water-related research projects, and recipients are encouraged to submit research papers to the SJWP state competition in April. Judges are also needed for AzSEF in Phoenix April 12. The science fair is also seeking volunteers to judge projects in grades K-12 in various categories, such as engineering, environmental sciences, and chemistry.

At each fair, SJWP judges will select up to 5 water-related projects in grades 9-12 to receive SJWP regional award certificates. Judges will also encourage students to submit research papers to the SJWP state competition in April. Time involved is approximately 2 hours. To sign up as a SJWP judge or request more information, please contact Lisa Clifton; Lisa3120@aol.com.

To learn more about the Stockholm Junior Water Prize go to: www.sjwp.org.

YP Block at AZ Water Association’s 84th Annual Conference and Exhibition

The Young Professionals’ session at the AZ Water Conference will present an overview discussion on the State of Arizona’s current and future water resources. Four speakers from a variety of agencies with backgrounds ranging from the Central Arizona Project; Salt River Project; and Arizona Department of Water Resources will discuss the history and background of Arizona’s water resources, current challenges of meeting water demands, and the future projections of the state’s water supply. Presentations will be followed by a panel discussion/debate regarding the state’s future water resources and ultimately answer the question: Is Arizona’s water sustainable?

When: Wednesday, May 4, 1:30 – 3:00 PM
Where: AZ Water 84th Annual Conference at Glendale Renaissance Hotel & Spa

4th Annual AZ Water YP Conference BBQ Raffle Call for Raffle Prize Donations

YPs are reaching out and asking for your help to collect prize donations. Proceeds from the donations benefit the Young Professional Committee Student Outreach Program which is a scholarship program that provides assistance to Arizona students pursuing higher education.

Past donations include: Skilsaw, Drills, Golf Bag, iPods, Mini Camcorder, Digital Camera, a Nook & many other great prizes.

If you wish to donate please contact Gretchen Hawkins; gahawkin@asu.edu.

Summer Technical Luncheon Series

The YP Summer Technical Luncheon Series will once again be returning in June! The technical luncheon series will be hosted at local firms throughout the Valley with industry experts presenting on a variety of topics geared toward Young Professionals. We are currently looking for interesting topics and speakers for this year’s Technical Luncheon Series. If there are any topics that YOU would like to learn more about, please email Anh Quach at aquach@carollo.com.

Check the Young Professionals Committee’s webpage for upcoming Networking and Social Events. If you are interested in participating in any event, being added to the YP mailing list or joining the committee email: Neil Woodroffe; neil.woodroffe@stantec.com.
DON’T MISS the 27th Tri-State Seminar On-the-River in Primm, Nevada. The Tri-State Seminar continues to be the best value for Water & Wastewater operations training anywhere!


Primm has excellent facilities including an air-conditioned indoor arena with space for over 185 vendor exhibits and a conference center with multiple classrooms. Primm is located on I-15 at the California/Nevada state line and is about a 35-minute drive from McCarran Airport in Las Vegas for those who wish to fly. Visit www.primmvalleyresorts.com for more information on Primm and its facilities.

FOR HOTEL RESERVATIONS CONTACT: www.primmvalleyresorts.com or the Primm Valley Resorts at 1-800-386-7867. Be sure to mention you are attending the Tri-State Seminar to receive the discount rate. Mention Group Code SCT2011.

REGISTRATION: Online Registration opens June 1, 2011. On or before August 31, 2011 - $95.00. After August 31, 2011 and on site registration - $120.00.

We Hope to See You Once Again in Primm, Nevada Tri-State Seminar 2011
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AZ Water Association Membership Form

This information will be added to our database and used to inform you of opportunities specific to your needs. Your contact information will also be used in our annual membership directory. If you do not want this information published in our annual directory, please check here ☐.

Please Print

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Please help us serve you better by indicating the categories that best describe your business/industry, environmental focus, job title, and field services (if one is more prominent than another, please indicate so).

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☐ public owned municipal or special district, water, wastewater treatment system or plant process < 1mgd
☐ administration and/or enforcement of government environment programs administration of public health programs

PRIVATE ENTITY
☐ private or investor owned facility
☐ private industrial systems
☐ consultant
☐ contractor
☐ manufacturer (equipment or representative)
☐ distributor (equipment or representative)

OTHER ENTITIES
☐ educational institutions (all components)
☐ research laboratory
☐ other ___________________________________________________________________

FIELD SERVED
☐ water supply only
☐ wastewater only
☐ both industries
☐ other ___________________________________________________________________

ENVIRONMENTAL FOCUS
☐ wastewater
☐ water
☐ process water
☐ ground water
☐ solid waste
☐ storm water
☐ pollution prevention
☐ residual/biosolids management
☐ coastal, river, lake ecology/surface water
☐ toxic & hazardous materials
☐ public education / information
☐ instrumentation/automation controls
☐ other ___________________________________________________________________

JOB TITLE
☐ EXECUTIVE: commissioner, board member, city manager, mayor, president, vice president, owner, partner, director
☐ MANAGEMENT: division head, section head, manager, chief engineer, comptroller, etc.
☐ ENGINEERING/NON MANAGERIAL: civil engineer, mechanical engineer, environmental engineer, planning manager, field engineer, system designer
☐ SCIENTIFIC/NON MANAGERIAL: chemist, biologist, biophysicist, researcher, analyst, etc.
☐ PURCHASING: purchasing agent, procurement specialist, buyer
☐ OPERATIONS: foremen, operator, maintenance, crewman, service representative, etc.
☐ MARKETING & SALES-NON MANAGERIAL: market analyst, marketing representative, sales representative, etc.
☐ STUDENT
☐ RETIRED INDUSTRY REPRESENTATIVE
☐ OTHER ___________________________________________________________________

Member Dues are Subject to Change

☐ Individual Annual Membership — $45  ☐ Student Annual Membership — $15

RETURN YOUR MEMBERSHIP APPLICATION ALONG WITH ANNUAL DUES TO:
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Questions? Call toll free 888-559-8844 • 928-717-9905 phone • 928-717-9910 fax
recognizing operators as guardians
continued from page 28

• The goal should be that every operator in every plant should be certified.

WHAT WEF IS DOING

Through a pilot program, WEF is working with MAs to collaborate on the development and sharing of content for operator training materials. In response to a request from an MA, WEF is developing and launching an online Operations Resource Center.

WEF is seeking broad input to a major revamp and update of its Wastewater Operations Certification and Training Position Statement. This statement will address issues such as certification, training, and reciprocity. The position statement will form the basis of WEF and MA outreach and input to policy-makers, regulators, utility managers, and other key stakeholders on this important issue. We hope and expect it will catalyze action.

WEF is beginning to plan for a Certification Summit to be held in spring. The summit will include representatives of WEF, its MAs, EPA, AWWA, and ABC.

TRIVIA ANSWERS

(From the Arizona Historian on page 25)

B. 11 Oct 1492. After departing Spain on August 3, 1492 Columbus thought he had sighted East Asia but it turned out to be an island in the Bahamas made up of 29 islands. Later in October 1492 he spotted what is today known as Cuba which he mistook for China. In December 1492 he reached Hispaniola, a large island in the Caribbean; home to the Dominican Republic and Haiti, which he initially thought was Japan!
C. A 63 year old school teacher named Annie Taylor, in October 1901. She rode over the Falls in a barrel and reached shore approximately 20 minutes after starting her journey – a bit banged up, but okay.
D. October 28, 1965. Architect Eero Saarinen designed the monument (630 f.t in height) to honor Thomas Jefferson’s decision to purchase the Louisiana Territory from the French in 1803. The Arch celebrates St. Louis’ central role in the western expansion that followed. The monument opened to the public on July 10, 1967.
E. October 21, 1938. The radio broadcast on Halloween of 1938 of Orson Welles’ rendition of the H. G. Wells’ classic tale sent many Americans into a panic! Nearly two million of the seven million or more listeners that day believed Martians were actually invading Grovers Mill, New Jersey!

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Jay Howe
Utilities Director
City of Safford
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Join us for the 84th Annual AZ Water Association Conference & Exhibition during National Drinking Water Week. The beautiful Renaissance Glendale Hotel & Spa provides the facilities and services we require as the AZ Water Annual Conference continues to grow in attendance and exhibits.

The 2011 Conference Program is better than ever! Many dedicated volunteers have spent tremendous amounts of time and energy putting together the conference. Our Program committee has been able to select from over 145 abstracts submitted to create a program that meets the needs of all in the water community. And, with over 140 exhibits, this is your best opportunity to see the latest in equipment, technology and services for the water and wastewater industry. There’s something for everyone!

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• Easy day trip – no overnight travel approval
• Opportunity to network with other AZ Water Professionals
• Meet with vendors to see what’s new and can help streamline your operations and maintenance.

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  ~ Local research findings on desalination, salinity, reuse, energy management, and recovery
• Network with your clients and market to new clients
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• Learn about new ways to:
  ~ Fast track project design and construction
  ~ Use physical models to optimize design

ARE YOU A REGULATOR? YOU CAN...
• Hear the latest technical information on:
  ~ Occurrence of and treatments for endocrine disruptors
  ~ Future contaminants and the latest measuring techniques
  ~ Advanced oxidation
• Find new research partnership opportunities
• See what your peers are doing
• Network with other researchers in private industry as well as academia and public agencies.

There is no other State water conference where you will experience this broad spectrum of water knowledge and information enabling you to improve your skills, knowledge, and impact for the future. Our lives as Arizona citizens and its future generations depend on you and your commitment to professional development and training time. The 84th annual gathering of the AZ Water Association Conference & Exhibition will stimulate thought and raise awareness about our State’s future, and its water infrastructure.

What do you need to do as a water professional in this century to help Arizona into the next several decades and beyond?

Arizona’s Water Future is Here! Come and join us!
GENERAL INFORMATION

HOTEL RESERVATIONS
Renaissance Glendale Hotel & Spa
9495 W. Coyotes Boulevard
Glendale, AZ 85305

Special AZ Water Group Rate: $154 single/double. To receive this rate call 1-800-HOTELS1 (1-800-468-3571) and mention the AZ Water Annual Conference.

Reservations must be made by April 22. The hotel will continue to accept reservations at the group rate after the cut-off date, but only if rooms are still available.

CONFERENCE LOCATION
Renaissance Glendale Hotel & Spa
9495 W. Coyotes Boulevard, Glendale, AZ 85305
http://www.renaissanceglendale.com

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• Center with indoor lap pool and exercise equipment
• Fully-equipped 24-hour business center
• Soleil restaurant serving breakfast, lunch and dinner
• Ray’s lounge with outdoor seating surrounded by water and fire features
• Caffeina’s Marketplace Café – proudly brewing Starbucks® coffee

PARKING INFORMATION
The parking lots to the north and southeast sides of the Hotel do not belong to the Renaissance Glendale Hotel & Spa and therefore are not liable for any damage or towing that may ensue. Currently these parking lots can be used for conference attendees during the day, but are subject to towing if left overnight (signs are posted). Therefore, if you are staying at the Hotel overnight, please use the Hotel parking options.

The Hotel provides self and valet parking. Self parking is available in their covered garage and is accessed hourly up to $11 per day. Each individual guest will be responsible for their own parking charges.

REGISTRATION
Registration is located in the meeting room lobby (see map on inside back cover). Pre-Registration is highly encouraged, however on-site registration will be accepted. Registration forms should be mailed, faxed, or you may register online at www.azwater.org.

What Does My Registration Include? Admission to all seminar sessions, admission to the exhibit hall (Wednesday and Thursday only), instruction materials, and the following meals.

Full Conference Registration:
Breakfast: W, TH, F
Breaks: W, TH, F
Lunch: W, TH, F
Barbecue: W

One-day Registration:
Wednesday: Breakfast, Breaks, Lunch, Barbecue
Thursday: Breakfast, Breaks, Lunch
Friday: Breakfast, Breaks, Lunch

CANCELLATIONS & REFUNDS
If you must cancel your conference enrollment, please notify AZ Water in writing. Cancellations received before the start of the conference will receive a full refund, minus a $35 handling charge. No refunds will be issued for cancellations received after the conference has begun. Refunds will be issued after the conference. Substitutions are allowed for individuals unable to attend the conference.

PROFESSIONAL DEVELOPMENT HOURS
Professional Development Hours (PDHs) are available for attending the conference technical sessions and workshops. A maximum of 18 PDHs will be awarded based on your attendance. The licensee is responsible for choosing sessions that meet the PDH requirements for their specific certification. AZ Water will issue a certificate to indicate the number of PDHs awarded during the conference, but cannot guarantee that all PDHs will qualify for every licensee. Four weeks after the conference you will receive your PDH certificate.

EXHIBIT INFORMATION
Exhibits will be in the Media Room at the Renaissance Glendale Hotel (in the same vicinity as the meeting rooms & registration). Prize drawings, raffles, and the Water For People Auction will be presented during the dedicated exhibit hours on both days. Interested in exhibiting? Go to www.azwater.org and download the exhibitor package.

WEDNESDAY, MAY 4
Exhibit Hall will be open all day
8:00 am - 5:00 pm
Dedicated exhibit hours
10:30 am - 12:00 pm and 3:00 pm - 4:00 pm

THURSDAY, MAY 5
Exhibit Hall will be open
8:00 am - 12:00 pm
Dedicated exhibit hours
10:30 am - 12:00 pm
Exhibits close down at noon.

CONTACT INFORMATION
General Information: Debbie Muse 928-717-9905
Registration: Cindy Martinez 520-575-8100
Exhibits: Jason Vernon 602-275-4303
Golf Tournament: Jay Bailey 602-275-4303
Web Site: www.azwater.org
### AZ Water 2011 Annual Conference Program — Wednesday, May 4, 2011

#### Registration

<table>
<thead>
<tr>
<th>TIME</th>
<th>ACTIVITY</th>
</tr>
</thead>
<tbody>
<tr>
<td>7:00</td>
<td>OPENING SESSION / KEYNOTE ADDRESS / PANEL DISCUSSION</td>
</tr>
<tr>
<td>8:00</td>
<td>SERVICE AWARDS PRESENTATION</td>
</tr>
</tbody>
</table>

#### Technical Program

<table>
<thead>
<tr>
<th>TIME</th>
<th>TRACK 1</th>
<th>TRACK 2</th>
<th>TRACK 3</th>
<th>TRACK 4</th>
<th>TRACK 5</th>
<th>TRACK 6</th>
<th>TRACK 7</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00</td>
<td>Water Treatment</td>
<td>Odor Control</td>
<td>Young Professionals</td>
<td>Management of Reuse Systems</td>
<td>Security</td>
<td>Utility Management</td>
<td></td>
</tr>
<tr>
<td>9:45</td>
<td>BREAK</td>
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<tr>
<td>10:30</td>
<td>OPENING SESSION / KEYNOTE ADDRESS / PANEL DISCUSSION</td>
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<tr>
<td>12:00</td>
<td>LUNCH</td>
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<tr>
<td>1:00</td>
<td>WATER TREATMENT</td>
<td>ODOUR CONTROL</td>
<td>YOUNG PROFESSIONALS</td>
<td>MANAGEMENT OF REUSE SYSTEMS</td>
<td>SECURITY</td>
<td>UTILITY MANAGEMENT</td>
<td></td>
</tr>
<tr>
<td>2:00</td>
<td>BREAK</td>
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<tr>
<td>3:00</td>
<td>MANUFACTURER'S EXHIBITION BREAK</td>
<td>MANUFACTURER'S EXHIBITION BREAK</td>
<td>MANUFACTURER'S EXHIBITION BREAK</td>
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</tbody>
</table>

#### Sessions and Speakers

Sessions and speakers are tentative and subject to change. Refer to the final conference program guide when you pick up your registration package.
## SCHEDULE – THURSDAY, MAY 5, 2011

### MANUFACTURER’S EXHIBITION BREAK

<table>
<thead>
<tr>
<th>TRACK 6</th>
<th>TRACK 7</th>
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<tbody>
<tr>
<td>3:00-3:30</td>
<td>3:00-3:30</td>
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</table>

### MANUFACTURER’S EXHIBITION BREAK

<table>
<thead>
<tr>
<th>TRACK 3</th>
<th>TRACK 4</th>
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<tbody>
<tr>
<td>10:00-10:30</td>
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### MANUFACTURER’S EXHIBITION BREAK

<table>
<thead>
<tr>
<th>TRACK 5</th>
<th>TRACK 7</th>
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<tbody>
<tr>
<td>6:00-9:00</td>
<td>6:00-9:00</td>
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### MANUFACTURER’S EXHIBITION BREAK

<table>
<thead>
<tr>
<th>TRACK 1</th>
<th>TRACK 2</th>
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<tbody>
<tr>
<td>10:00-10:30</td>
<td>10:30-11:30</td>
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</tbody>
</table>

### MANUFACTURER’S EXHIBITION BREAK

<table>
<thead>
<tr>
<th>TRACK 1</th>
<th>TRACK 2</th>
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</thead>
<tbody>
<tr>
<td>3:00-3:30</td>
<td>3:30-4:00</td>
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### MANUFACTURER’S EXHIBITION BREAK

<table>
<thead>
<tr>
<th>TRACK 1</th>
<th>TRACK 2</th>
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<tbody>
<tr>
<td>4:00-4:30</td>
<td>4:30-5:00</td>
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</table>

### MANUFACTURER’S EXHIBITION BREAK

<table>
<thead>
<tr>
<th>TRACK 1</th>
<th>TRACK 2</th>
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<tbody>
<tr>
<td>5:00-5:30</td>
<td>5:30-6:00</td>
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### MANUFACTURER’S EXHIBITION BREAK

<table>
<thead>
<tr>
<th>TRACK 1</th>
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<tbody>
<tr>
<td>6:00-6:30</td>
<td>6:30-9:00</td>
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</table>

Sessions and speakers are tentative and subject to change. Refer to the final conference program guide when you pick up your registration package.
<table>
<thead>
<tr>
<th>TIME</th>
<th>TRACK 1</th>
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<th>TRACK 3</th>
<th>TRACK 4</th>
<th>TRACK 5</th>
<th>TRACK 6</th>
<th>TRACK 7</th>
<th>TRACK 8</th>
</tr>
</thead>
<tbody>
<tr>
<td>8:00 - 8:30</td>
<td>GRADE TREATMENT SYSTEMS</td>
<td>REGULATORY</td>
<td>TECHNICAL PROGRAM</td>
<td>TECHNICAL PROGRAM</td>
<td>TECHNICAL PROGRAM</td>
<td>TECHNICAL PROGRAM</td>
<td>TECHNICAL PROGRAM</td>
<td>TECHNICAL PROGRAM</td>
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<tr>
<td>8:30 - 9:00</td>
<td>WATER FOR PEOPLE</td>
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<tr>
<td>9:00 - 9:30</td>
<td>LUNCH &amp; GAVEL PASSING</td>
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<td>10:00 - 10:30</td>
<td>BREAK</td>
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<td>10:30 - 11:00</td>
<td>WATER FOR PEOPLE</td>
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<td>11:00 - 11:30</td>
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<td>11:30 - 12:00</td>
<td>WATER FOR PEOPLE</td>
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<td>12:00 - 1:00</td>
<td>WATER FOR PEOPLE</td>
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<td>1:00 - 2:00</td>
<td>WATER FOR PEOPLE</td>
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<td>2:00 - 2:30</td>
<td>WATER FOR PEOPLE</td>
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<td>2:30 - 3:00</td>
<td>WATER FOR PEOPLE</td>
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<td>WATER FOR PEOPLE</td>
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<td>3:30 - 4:00</td>
<td>WATER FOR PEOPLE</td>
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<td>4:00 - 4:30</td>
<td>WATER FOR PEOPLE</td>
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</tbody>
</table>

**TECHNICAL PROGRAM**

**TRACK 1**
- Water Quality/Regulatory
- Water Quality/Regulatory
- Water Quality/Regulatory
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- Water Quality/Regulatory
- Water Quality/Regulatory

**TRACK 2**
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- Water Quality/Regulatory
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- Water Quality/Regulatory

**TRACK 3**
- Water Quality/Regulatory
- Water Quality/Regulatory
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- Water Quality/Regulatory

**TRACK 4**
- Water Quality/Regulatory
- Water Quality/Regulatory
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- Water Quality/Regulatory

**TRACK 5**
- Water Quality/Regulatory
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- Water Quality/Regulatory

**TRACK 6**
- Water Quality/Regulatory
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- Water Quality/Regulatory
- Water Quality/Regulatory

**TRACK 7**
- Water Quality/Regulatory
- Water Quality/Regulatory
- Water Quality/Regulatory
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- Water Quality/Regulatory
- Water Quality/Regulatory
- Water Quality/Regulatory

**TRACK 8**
- Water Quality/Regulatory
- Water Quality/Regulatory
- Water Quality/Regulatory
- Water Quality/Regulatory
- Water Quality/Regulatory
- Water Quality/Regulatory
- Water Quality/Regulatory
- Water Quality/Regulatory

Sessions and speakers are tentative and subject to change. Refer to the final conference program guide when you pick up your registration package.
# 84TH AZ WATER CONFERENCE & EXHIBITION REGISTRATION FORM

**One Registrant Per Form**

<table>
<thead>
<tr>
<th><strong>REGISTRATION CATEGORY</strong></th>
<th><strong>MEMBER</strong></th>
<th><strong>NON-MEMBER</strong></th>
<th><strong>TOTAL</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>FULL ANNUAL CONFERENCE</strong></td>
<td>May 4 - May 6, 2011</td>
<td>$340</td>
<td>$390</td>
</tr>
<tr>
<td>Includes: Sessions/Exhibits</td>
<td>Breakfast W TH F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Barbecue</td>
<td>W Breaks W TH F</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attending Barbecue?</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td><strong>ONE DAY REGISTRATION</strong></td>
<td>Wednesday, May 4</td>
<td>$160</td>
<td>same</td>
</tr>
<tr>
<td>Includes: Sessions/Exhibits</td>
<td>Breakfast • Breaks • Lunch • Barbecue</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Attending Barbecue?</td>
<td>Yes</td>
<td>No</td>
<td></td>
</tr>
<tr>
<td>Thursday, May 5</td>
<td>$160</td>
<td>same</td>
<td>$190</td>
</tr>
<tr>
<td>Includes: Sessions/Exhibits</td>
<td>Breakfast • Breaks • Lunch</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Friday, May 6</td>
<td>$150</td>
<td>same</td>
<td>$175</td>
</tr>
<tr>
<td>Includes: Sessions</td>
<td>Breakfast • Break • Lunch</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**STUDENTS**

Sessions & Exhibits Free (meals extra)

----

**OPTIONAL EVENTS**

- **Golf Tournament**
  - Tuesday, May 3
  - Use enclosed registration form

- **Facility Tour: University of Phoenix Stadium at the Barbecue**
  - Wednesday, May 4
  - $10.00
  - Quantity

**EXTRA MEAL TICKETS**

<table>
<thead>
<tr>
<th><strong>Breakfast</strong></th>
<th>Wednesday, May 4</th>
<th>$18.00</th>
<th>Quantity</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Luncheon Program</strong></td>
<td>Wednesday, May 4</td>
<td>$32.00</td>
<td>Quantity</td>
</tr>
<tr>
<td><strong>Barbecue (children 5 and under are free)</strong></td>
<td>Wednesday, May 4</td>
<td>$35.00</td>
<td>Quantity</td>
</tr>
<tr>
<td><strong>Barbecue (children 6 through 12)</strong></td>
<td>Wednesday, May 4</td>
<td>$10.00</td>
<td>Quantity</td>
</tr>
<tr>
<td><strong>Breakfast</strong></td>
<td>Thursday, May 5</td>
<td>$18.00</td>
<td>Quantity</td>
</tr>
<tr>
<td><strong>Luncheon Program</strong></td>
<td>Thursday, May 5</td>
<td>$32.00</td>
<td>Quantity</td>
</tr>
<tr>
<td><strong>Breakfast</strong></td>
<td>Friday, May 6</td>
<td>$18.00</td>
<td>Quantity</td>
</tr>
<tr>
<td><strong>Luncheon Program</strong></td>
<td>Friday, May 6</td>
<td>$32.00</td>
<td>Quantity</td>
</tr>
</tbody>
</table>

**AZ WATER MEMBERSHIP RENEWAL**

(if not current) $45.00

**AZ WATER NEW MEMBERSHIP**

$45.00

**TOTAL ENCLOSED**

Make checks payable to “AZ Water” & mail to:

Conference Registrar
P.O. Box 36870
Tucson, AZ 85740
Fax to: 520-877-1189

Spring 2011 AZ Water Association
The AZ Water Association strives to provide value to our members by offering an annual three-day conference designed to provide professional development, continuing education, and distribution of technical information regarding the enhancement of Arizona’s drinking water, water reuse, and environmental resources. The theme for our 84th Annual Conference and Exhibition is “Arizona’s Water Future is Here!”

Your company’s sponsorship of the conference will help AZ Water continue to develop quality education programs that serve our members, while keeping registration costs to a minimum. Level Sponsorships are used to help offset annual conference events such as the facility, speakers, training materials, awards, luncheon programs, barbecue, and other conference-related meals.

Levels Available:  
- Gold - $750  
- Silver - $500  
- Bronze - $250

What recognition do sponsors receive?
- Company will be listed in conference printed material.
- Company will be listed on the conference web site with a link to the company web site.
- Company will be listed on signage at the conference (during all events and in registration area).
- Company will be listed in the AZ Water summer newsletter as a Gold, Silver, or Bronze Sponsor  
  (The newsletter will reach approximately 2,500 AZ Water members).

Yes, my company would like to sponsor the 84th Annual AZ Water Conference & Exhibition. If your sponsorship form is received by April 15 your company will be listed in the Conference Program Guide. If not, you will still be listed on conference signage, the web site, and in the summer issue of the AZ Water Newsletter “The Kachina News”.

Contact Person ______________________________________________________________________________________________

Company ____________________________________________________________________________________________________

Address ______________________________________________________________________________________________________

Phone __________________________________   Fax ____________________________  Email ____________________________

Please check the level of sponsorship:
- GOLD LEVEL ($750) ______  
- SILVER LEVEL ($500) ______  
- BRONZE LEVEL ($250) ______

Payment:  
- MC_____  
- VISA_____  
- American Express_____

Credit Card Number ___________________________ Exp. Date___________

Email Receipt to: ______________________________________________________________________________________________

Authorized Signature __________________________________________________________________________________________

Enclosed is my check for $______________________________

(Make check payable to AZ Water)

For additional information, please contact Debbie Muse at AZ Water, 928-717-9905 or by email musegroup@aol.com.

Return completed form and payment to:
AZ Water, 1042 Willow Creek Rd., A101-510, Prescott, AZ  86301
84th ANNUAL CONFERENCE GOLF TOURNAMENT

This year’s tournament is scheduled for Tuesday, May 3, 2011 at the JW Marriott Wildfire Golf Club, 5350 E. Marriott Drive, Phoenix, AZ 85054, www.wildfiregolf.com. Registration deadline is Friday April 22, 2010.

The field is limited to the first 216 entrants. Registration is at 6:30 AM with a 7:30 a.m. shotgun start. Awards presentation and lunch will directly follow play. This year’s format will be a four person scramble. Dress Code: Soft spikes only, collared shirts with sleeves, shorts must be hemmed and no blue jeans. Donations: Firms wishing to donate prizes should contact Jay Bailey at 602-317-0333 or jay@coombshoppins.com.

Tournament sponsorships are $1,000.00 and include a foursome in the tournament and one hole sponsorship. All proceeds go to the AZ Water Scholarship Program. Individual hole sponsorships are available for $500.00. Hole sponsors are NOT responsible for making their own signs. Email your logo to jay@coombshoppins.com.

Sponsor/Team______________________________________________________________

Address __________________________________________________________________

Email & Phone ____________________________

☐ TOURNAMENT SPONSOR - $1000.00 (foursome included) Make checks payable to: AZ Water
☐ HOLE SPONSOR - $500.00 (foursome not included)
☐ FOURSOME $600.00 or ☐ $150 per player (PLAYER NAMES BELOW) Total Amount $___________

1._________________________________________ 2._________________________________________
3._________________________________________ 4._________________________________________

Credit Card (VISA, MC or AMEX) # ____________________________ Expires_________

Cardholder Name________________________________ Signature_________________

E-mail, Fax or Mail your Sponsorship/Registration to: Jay Bailey, jay@coombshoppins.com
Coombs Hopkins, 668 N. 44th Street, Suite 251, Phoenix, AZ 85008
Phone: 602-317-0333 Fax: 602-636-2555
ENVIROMENTAL WORKSHOPS - TRAINING AND FREE PDHS

Wednesday, March 16, 2011
City of Goodyear - Public Works Administration Building
4980 South 157th Ave., Goodyear, AZ 85338
2 PDHs 9:15 AM – 12:00 PM
*Coliform Bacteria-Sample Collection and Analysis
Presented by: Robert Vertefeuille, Director of Operations/Sr. Microbiologist
*Sample Containers, Preservatives & Hold Times & Lab Forms
Presented by: Dianne Frydrych, Sales and Marketing Manager

Wednesday, April 20th, 2011
Camp Verde Sanitary District – Marshall’s Office
646 South 1st St., Camp Verde, AZ 86322
2 PDHs 9:15 AM – 12:00 PM
Emerging Waterborne Pathogens
Presented by: Robert Vertefeuille, Director of Operations/Sr. Microbiologist
Essentials of BOD Testing for Wastewater Operators
Presented by: Dianne Frydrych, Sales and Marketing Manager

Thursday, May 12, 2011
Town of Buckeye Water Resources at the Buckeye Valley Chamber
508 Monroe, Buckeye, AZ 85326
2 PDHs 9:15 AM – 12:00 PM
Metals Testing 101
Presented by: Dianne Frydrych, Sales and Marketing Manager
Interpreting Your Report
Presented by: Robert Vertefeuille, Director of Operations/Sr. Microbiologist

Class sizes will be limited. Please register by contacting Dianne Frydrych, Sales and Marketing Manager:
(602) 324-6121 or dfrydrych@legend-group.com
Visit (www.azwater.org) for upcoming workshops
ADEQ is offering **FREE** training at the following dates and locations. Earn your PDHs while you improve your skill in the topics offered.

- January 12-13, 2011 – Tubac
- February 10, 2011 – Phoenix
- February 15-16, 2011 – Camp Verde
- March 15-16, 2011 – Kingman
- March 23-24, 2011 – Sierra Vista
- April 14, 2011 – Phoenix
- April 26-27, 2011 – Tucson
- May 12, 2011 – Phoenix
- May 17-18, 2011 – Prescott
- June 9, 2011 – Phoenix
- June 15-16, 2011 – Flagstaff

*note: dates listed are subject to change. Please visit [www.azdeq.gov](http://www.azdeq.gov) for official dates and locations.*

The ERG program was developed to provide training and benefits to eligible, certified operators. However, any operator or community member may attend department sponsored technical training.

Noah Adams, ADEQ, (602-771-4511, nra@azdeq.gov) will address questions concerning workshops.

Space is limited so please pre-register ASAP!
Register online at: [http://www.OPSCERT-ERG.com](http://www.OPSCERT-ERG.com)
For registration questions please contact April Adams, Corporate Destination Services, at april@corpdest.com or phone (602-482-1788) fax (602-482-2113).

**Special hotel room rates are available; however you must reserve rooms in advance and request the ADEQ rate.**
15th ANNUAL AZ WATER WATER FOR PEOPLE GOLF TOURNAMENT

JUNE 25, 2011
TROON NORTH GOLF CLUB
10320 E. Dynamite Blvd., Scottsdale, Arizona

SCHEDULE OF EVENTS:
Registration - 6:30 am
Golfers “Cart Up” - 7:50 am
Shotgun Start, Scramble Format - 8 am
Luncheon, Awards Program & Prize Drawing Following Golf

$120/GOLFER
Mulligans 2 for $20, Includes Entry for Door Prizes
Proper Golf Attire Required, No Jeans or Cutoffs

REGISTRATION FORM

Contact Name: ____________________________ Phone: ____________________________
Company: ____________________________ Email: ____________________________
Address: ____________________________
City: ____________________________ State: ____________________________ Zip: ____________________________

GOLFER(S) NAMES: T-SHIRT SIZE (circle one): BE A SPONSOR:

1. ____________________________ ($120) S M L XL XXL □ Hole-in-One ($2500+)
2. ____________________________ ($120) S M L XL XXL □ Birdie ($500+)
3. ____________________________ ($120) S M L XL XXL □ Eagle ($1500+)
4. ____________________________ ($120) S M L XL XXL □ Monetary Donation $ __________

Total Enclosed: $ ____________________________ Special Dietary and/or Other Requests: ____________________________

Payment must be received by June 10, 2011 to guarantee your place in the tournament.
Make check payable to “AZ Water Association” OR Register online. See below for details.

Fax or Mail registration to: Venkat Radhakrishnan, Malcolm Pirnie, 4646 E. Van Buren St., Suite 400, Phoenix, AZ 85008
Phone: 602-797-4580 • Fax: 602-231-0131 • Email: venkat.radhakrishnan@arcadis-us.com
OR Register Online at http://azwater.org/events/waterforpeoplegolftournament.aspx
# Title Sponsorship

**Minimum Contribution:** $5000

A Title Sponsor for the Tournament will be entitled to:

1. A 20 person 9-hole Golf Event at Troon North (valued at $3200)
   For details, contact Venkat Radhakrishnan at 602-797-4580
2. 2 Foursomes at the Golf Tournament (valued at $960)
3. Company Name included in the Tournament Name
   For example, "Company Name Presents 15th Annual AZ Water
   For People Golf Tournament"
4. Prominent display of the sponsor’s logo/name on every official piece of Golf Tournament material
5. Logo/name on all communications related to the Tournament
6. Largest logo on the sponsor board displayed at the Tournament
7. The largest logo on the back of the t-shirt
8. Acknowledgement in the Water For People annual report
9. Acknowledgement in AZ Water Kachina Newsletter
10. Logo/name on the registration website

## Sponsorship Level · Contribution · Benefits

<table>
<thead>
<tr>
<th>Sponsorship Level</th>
<th>Contribution</th>
<th>Benefits</th>
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<tbody>
<tr>
<td>Hole-in-One</td>
<td>$2500 minimum</td>
<td>The first Hole-In-One Sponsor gets a special prize. 2 Foursomes at the Golf Tournament, Large Logo on the back of the tournament t-shirt, Large Logo on the sponsors board, Acknowledgement in AZ Water Association Kachina Newsletter</td>
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<td>Eagle</td>
<td>$1500 minimum</td>
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<td>Birdie</td>
<td>$500 minimum</td>
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<td>Par</td>
<td>$250 minimum</td>
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<td>Gift Prize</td>
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GUIDELINES FOR USE OF MINI-HORIZONTAL DIRECTIONAL DRILLING FOR PLACEMENT OF HDPE PIPE, INCLUDING WATER APPLICATIONS

Dr. Lawrence M. SLAVIN
Outside Plant Consulting Services, Inc.

INTRODUCTION
User-friendly guidelines for the placement of high density polyethylene (HDPE) pipe with mini-horizontal directional drilling equipment have recently been developed by the Plastics Pipe Institute (PPI). Technical Report TR-46, “Guidelines for Use of Mini-Horizontal Directional Drilling for Placement of High Density Polyethylene Pipe”, represents a comprehensive set of information which is directly applicable to water applications. The new document is intended to provide information analogous to that provided in ASTM F 1962, “Standard Guide for Use of Maxi-Horizontal Directional Drilling for Placement of Polyethylene Pipe or Conduit Under Obstacles, Including River Crossings”, but at a level appropriate for the less complex mini-HDD technology and typical project characteristics.

TR-46 reflects the latest industry information, but also includes new information not readily available elsewhere, or in a convenient format, and is readily available to the public via the web-site of the Plastics Pipe Institute at http://plasticpipe.org/pdf/tr-46-hdd-guidelines.pdf.

Figures 1 and 2 illustrate typical mini-horizontal directional drilling (mini-HDD) equipment and pilot boring and back-reaming operations, including placement (pullback) of the product pipe, such as for water applications.

Mini-horizontal directional drilling (mini-HDD) is typically employed for boring segments less than 600 feet in length, at depths up to 15 feet, and placing pipes up to 12 inches diameter. In contrast, maxi-HDD technology is capable of accurately boring holes thousands of feet in length, and placing pipes of 48 inches or greater, at depths up to 200 ft. Maxi-HDD machines may weigh as much as 30 tons, or greater, and is appropriate for placing pipes under large rivers or other major obstacles.

Figure 1 Typical Mini-HDD Equipment and Pilot Boring Process
(Source: Outside Plant Consulting Services, Inc.)

Figure 2 Typical Mini-HDD Back-Reaming and Pipe Pullback Process
(Source: Outside Plant Consulting Services, Inc.)

DESCRIPTION
Technical Report TR-46 contains ten main chapters or sections, as briefly described below, supplemented by several appendices.

Scope, Related Industry Standards and Terminology (Sections 1, 2 and 3)
TR-46 addresses planning, design, drill rig setup, and installation practices for the placement of polyethylene pipe using mini-HDD equipment. The primary focus is on commonly used high density polyethylene (HDPE) pipe with a material designation code of either PE3608 or PE4710. Information is also provided for pipe of medium density polyethylene (MDPE) PE2406/2708 material. Depending on the diameter, polyethylene pipe may be supplied in continuous lengths on a reel or discrete segments which would typically be fused together in the field. In addition to water supply applications, such pipe may be used for conveying various other fluids (natural gas, oil, ...), as well as conduits for containing utility cables.

Preliminary Site Investigation (Section 4)
The general feasibility of utilizing mini-HDD technology for placing the proposed pipeline(s) must be determined prior to any proposed construction activities. Such a preliminary investigation is required to gain an understanding of the local characteristics in order to help ensure a cost-effective, efficient and, above all, safe operation. Of particular importance, and as addressed in other sections of the guidelines, is the awareness of existing utilities in the vicinity of the proposed pipeline and the need to maintain minimum specified clearances during the construction process.
Safety and Environmental Considerations (Section 5)
Safety is a primary concern, during any activity, including construction utilizing mini-HDD equipment and procedures. Potential safety issues fall into two general categories: (1) those directly related to the setup and operation of the mini-HDD equipment, and (2) those associated with the proper location, identification and marking procedures intended to avoid contacting and damaging existing utilities. Section 5 of TR-46 addresses the first category, providing practices to avoid or minimize equipment-related risks during mini-HDD operations.

 Regulations and Damage Prevention (Section 6)
Section 6 of TR-46 addresses the second category of potential safety issues, focusing on procedures to eliminate or reduce hazards associated with damaging existing utilities, including during the initial boring or back-reaming operations. Recommended practices include “call-before-you dig” (811); properly locating and marking existing utilities, as well as exposing such utilities at anticipated crossings with the bore path; avoiding mechanized digging within the required tolerance zone; and the use of Subsurface Utility Engineering.

Pipe Design and Selection Considerations (Section 7)
In comparison to ASTM F 1962, which is generally intended for use by experienced engineers for major maxi-HDD installations, TR-46 contains a convenient calculation method appropriate for persons with various backgrounds, including the operators of mini-HDD equipment and/or the utility engineers. In particular, the procedure presented provides a means of selecting the pipe strength to avoid collapse due to hydrostatic pressure at the desired placement depth, as well as to withstand the required pulling loads during installation.

Bore Path Planning and Drill Rig Setup (Section 8)
TR-46 addresses the planning of the bore path, consistent with meeting the requirements of the project owner, including placement depth, and also provides corresponding drill rig setup information. Figure 3 illustrates a typical mini-HDD bore vertical profile trajectory, including occasional pits along the route, as may be required for pipe splicing, completing lateral connections, or to expose existing utilities. Figure 3 designates certain points along the bore path and their relative distances from the drill rod entry or exit points. These distances are a function of the entry angle and drill rod characteristics (e.g., allowable bend radius), and determine the setup location and space requirements in which to perform and complete the pipe installation.

Implementation (Section 9)
It is beyond the scope of the TR-46 guidelines to provide detailed operational procedures for the various mini-HDD and auxiliary equipment, which is generally available from the manufacturers or other sources. However, proper procedures are described for pilot boring, tracking, steering, reaming and pullback operations, as well as pipe handling and connection, record keeping.

Completion (Section 10)
Following installation of the pipe, it is necessary to confirm the viability of the new facility, provide a permanent record of the actual placement location, and ensure final site cleanup. In particular, the integrity of the pipes should be appropriately verified, depending upon the application, and the owner’s specifications. For water applications, any mud or debris that may have entered the pipe must be expelled, and the pipeline flushed, and the system pressurized and checked for leakage.

Appendices (A - F)
The ten main sections outlined above are supported by six appendices which provide examples of the application of the information described in Sections 7 and 8, as well as the theoretical basis for their development.

Although the TR-46 guidelines are primarily described with respect to mini-HDD operations, guidelines for the use of midi-HDD machines and associated practices may be obtained from the present TR-46 document, and/or ASTM F 1962, depending upon the particular application and the judgment of the contractor or engineer.

Outside Plant Consulting Services, Inc., 15 Lenape Avenue, Rockaway, NJ, 07866-1019, PH (973) 983-0813; FAX (973) 983-0813; email lslavin@ieee.org.

![Figure 3 Drill Rig Setup and Related Distances (Source: Outside Plant Consulting Services, Inc.)](image)
used directly as an energy source, they would represent more than seven times the total energy demand of the plant. As the biosolids are anaerobically digested at the North Toronto WWTP, a lower energy value estimated to represent two to four times the total operating energy demand of the plant remains in the liquid biosolids.

The goal of achieving a net-zero energy demand for wastewater treatment is widely discussed, even more so in light of recent success stories such as the Strass WWTP in Austria (Wett et al., 2007). Given the energy values of both raw and stabilized biosolids streams relative to the overall plant energy demand described above as well as the total mass of wastewater solids resources generated each year, the recovery of energy through the use of wastewater solids as biofuel is clearly a relevant topic.

What Has Been Done and What We Know

**Energy Recovery Baseline: Heat recovery from incineration of wastewater solids** Incineration is the full-combustion of wastewater solids in the presence of oxygen, producing waste heat as a potential energy source and residual ash. Incineration is a mature technology, applied through the application of either Multiple Hearth Incineration (MHI) or Fluidized Bed Incineration (FBI). FBI is a newer technology that comprises 20% of domestic installations. Compared to MHI, FBI is a more efficient process resulting in fewer gaseous emissions. Incineration can be considered as a classic example of energy recovery from wastewater solids. The long-term viability of MHI application for wastewater solids is in question due to potential challenges in meeting standards for Hazardous Air Pollutants (HAPs) under Section 129 of the Clean Air Act.

The heat energy released from the solids via combustion may be used within the incineration process for either pre-drying of raw wastewater solids or pre-heating of inlet air to the incinerator. Excess thermal energy has been used for steam production. Steam produced from waste heat may be used to supply process and space heating requirements of the treatment works, or to drive turbine generators as part of a combined heat and power (CHP) system as it is in Leeds, England. A novel use of waste heat recovered from wastewater solids incineration in Nijmegen, Netherlands where the activated sludge process temperature is elevated by 5–6°C to achieve year-round biological nutrient removal (Kruit et al., 2005).

**Wastewater solids gasification** Gasification differs from waste solids incineration in that pyrolysis occurs in the absence of complete combustion. Combustion can be considered as a multiple step process, including charring, gasification, and finally burning of the flammable gases released from the fuel source. When solids are heated to near 1000°C, the organic material is converted into a range of light gaseous compounds including carbon monoxide (CO) and hydrogen (H₂). In oxygen-starved environments, these gases do not ignite and may be captured and cooled into a product referred to as syngas (short for synthesis gas). The syngas may then be combusted (much the same as biogas or natural gas) after purification using engine or turbine generator technology. The energy yield of the gasification process is similarly sensitive to moisture and organic content of the wastewater solids as incineration, thus may be coupled with a solids drying and pelletization process.

Gasification is a well-established technology, and is largely applied in the clean coal and wood industries for power generation. Gasification of biosolids is more recent, but follows the same principles as coal or wood gasification. The only full-scale biosolids gasification process in the United States is in Sanford, FL and has gone through a period of early operations in 2009. It is envisioned that this facility will eventually provide a sustainable biosolids management and energy recovery option for not only Sanford, FL, but also surrounding municipalities (Pytlar, 2010). Another biosolids gasification system is currently being developed as part of a multi-stage project by the City of Stamford, CT Water Pollution Control Authority. Initially, gasification of wood biomass will be used to produce heat needed to produce dried Class A biosolids. Later stages however, may involve a closed loop cycle where dried biosolids would be gasified, and the resulting syngas would be used in a combined heat and power plant to produce heat for biosolids drying and excess power to operate the treatment facility (Brown et al., 2008).

**Solids carbonization** At lower temperatures than used for gasification, about 300°C, biosolids are converted to organic char. This char retains the organic content of the biosolids, but is more hydrophobic making the dewatering process easier. Centrifugal dewatering of the carbonized solids can achieve 50% total solids cake, and can be additionally dried to 95% total solids pellets by heat drying. A privately owned full-scale operating facility in Rialto, CA serves as a regional biosolids management facility for five municipal utilities. In 2009, the dried char, referred to as E-Fuel, produced had an energy value (~39 MW-hr): more than double that which was required for the facility’s operation (~18 MW/hr). All of the E-Fuel produced at this facility in 2009 was used by one of two nearby cement kilns (Kearney et al., 2010). It is also reported that combustion testing of the E-Fuel is an appropriate and cleaner burning alternative for fossil fuels for coal fired steam boilers (EnerTech, 2001). Several similar technologies, referred to collectively as sludge to oil technologies have been developed and piloted in the United States.

What is Not Known and Future Directions

Like many distributed power generation and energy recovery technologies, the viability of using dried wastewater solids as biofuels is dependent on scalability and incentives. For example, the industrial application of biomass gasifiers often involves systems that are orders of magnitude larger than would be applied for wastewater solids. The question of how small a biosolids gasification system can be applied in a cost-effective and reasonably operable manner is yet to be answered. Two facilities mentioned earlier, the solids carbonization facility in Rialto, CA and the gasification facility in Sanford, FL have at least partially overcome the scale-down challenges of these technologies by implementing a regional approach to biosolids management. Successes in developing inter-utility partnerships for wastewater solids as biofuel projects may promote the application of these technologies in the future. An additional challenge for wastewater utilities is availability of relatively inexpensive energy. Life-cycle cost analysis of biosolids management strategies that consider wastewater solids as biofuel are inherently performed against the baseline of affordable industrial energy prices, averaging less than $0.07 per kW-hr nationwide in 2010. The likelihood that wastewater solids to biofuel projects will be funded in the future could be enhanced if (1) distributed renewable power production or energy recovery projects are incentivized, (2)
triple bottom line and life-cycle assessment decision making methodologies that recognize the intrinsic value of renewable energy generation are adopted, or (3) industrial energy prices rise to a point where on-site power generation and energy recovery projects are economically preferable.

The development of a successful track record for several of the currently operating wastewater solids to biofuels systems will help to relieve the perception of risks associated with what are seen as novel technologies. By elevating the visibility of existing installations, it will be more likely that utility planners and decision makers will evaluate wastewater solids to biofuels technologies along with more conventional biosolids management strategies.

References

III. BIODIESEL

Background
Biodiesel production from waste streams is part of a growing trend in the renewable energy industry. Recently, components of wastewater have been identified as viable raw material sources (feedstock) for successful biodiesel production, including fats, oils and grease (FOG) and algae. Some utilities are recognizing that separating and processing these waste components into biodiesel can benefit treatment plant and collection system operations, infrastructure, and budget.

What is biodiesel? Biodiesel is a low-carbon renewable fuel made from biological based fats and oils, and can be utilized as a direct replacement for petroleum based diesel fuel in any diesel equipment, without equipment modifications. It has fewer emissions and carbon footprint than petro-diesel.

Relevance of Issue
FOG: As energy prices rise, regulatory pressures increase, and the importance of energy and resource recovery takes a more prominent role in wastewater treatment strategy, utilities will look to control their energy costs and to beneficially reuse waste materials. Biodiesel is typically made from plant oils and used fryer oils, but the expense of these commodities has driven biodiesel producers to investigate alternative feedstocks. Using FOG from wastewater (scum, lift station grease, and trap grease) to produce biodiesel is a promising solution.

FOG management and disposal is a major financial liability for waste treatment facilities, potentially costing millions of dollars per year. FOG builds up in collection systems, leading to sewer overflows, corrosion of sewer pipe, and significant operations to mitigate these issues. FOG requires significant aeration energy to breakdown, adding to operating budgets. Currently, most utilities dispose of FOG and do not capture the potential energy of the FOG material. However, conversion of FOG into biodiesel could not only produce a clean-burning, high-value fuel for sale or use by the utility, but may improve FOG handling compliance due to high visibility recycling of the material. Furthermore, the creation of a new and lucrative revenue stream in the form of tipping fees (from accepting grease from external sources) and biodiesel sales can help utilities turn current waste liabilities into financial assets.

Algae: The conversion of algae into biodiesel has also garnered significant attention in the biofuels industry. While algal oils are generally still in the research & development stage, some wastewater utilities have identified algae production as a potential win-win for the improvement of treatment plant performance. Since high nutrient content in wastewater is an excellent medium for algae growth, algae reactors could be utilized for highly-effective, low-energy nutrient removal. Additionally, CO2 emissions from the wastewater treatment plant (or from nearby CO2 emitters) could be directed to the algae reactors to be utilized for algae growth. The resulting algae biomass, which has high oil content, could then be harvested, refined and converted to biodiesel. Similar to FOG, algae could be turned into a lucrative revenue stream and reduce treatment costs.

What Has Been Done and What We Know
FOG: A number of wastewater treatment plants have installed waste receiving facilities, which typically receive grease trap waste and other industrial wastes from commercial waste haulers. The receiving facility provides utilities with additional revenue and the surrounding community with a disposal site for otherwise unwanted wastes. In most cases, this FOG is eventually mixed with finished biosolids and disposed of along those established disposal routes. A few wastewater utilities have recognized the intrinsic energy content available in FOG and pursued its utilization as a feedstock for biodiesel production. This technology is being commercialized now.

The East Bay Municipal Utility District (EBMUD) and the San Francisco Public Utilities Commission (SFPUC) have each undertaken a FOG-to-biodiesel pilot study in 2005 and 2010, respectively. The SFPUC study is ongoing and utilizes a patented process from BlackGold Biofuels. EBMUD published their findings in 2008, utilizing conventional biodiesel acid-base catalysis processes, with an additional acid esterification step. The results of this two-year bench scale and pilot study concluded that, though challenges were met removing certain contaminants, biodiesel could be produced from FOG received at the wastewater treatment plant, and that the biodiesel produced could be utilized in the utility’s diesel trucks without performance issue.

Algae: Algae is a promising biodiesel feedstock due to its high oil content and scalable production; however, specific strains of algae are needed and oil extraction technology is still in its infancy. Regardless, some wastewater treatment plants are honing their ability to grow algae with the nutrients available in wastewater. Algae growth is also currently utilized as an additional polishing step for wastewater effluent. Deoiled algae cake is a significant source of nutrients and may be diverted to an anaerobic digester to produce methane, for

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biofuels from wastewater, state of the industry

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generating the electricity necessary for running the algae production facility.

The City of Austin, Texas has an algae-to-biodiesel research and development facility owned and operated by Sunrise Ridge Algae Inc. at the City’s Hornsby Bend WWTP. At this facility, researchers have been able to demonstrate that algae can effectively remove nutrient pollutants from wastewater effluent and are working to integrate carbon dioxide consumption and bio-oil production. This has the potential to provide wastewater utilities with a highly efficient process for removing regulated pollutants from wastewater while generating revenues from biodiesel sales and “greening” plant operations.

What is Not Known and Future Directions

Meeting biodiesel quality standards proved challenging in the EBMUD study, and it was concluded that further study would be necessary to identify a cost effective method for conversion and polishing. The goal of the SFPUC study is to tackle and overcome these issues. Most utilities are not aware of the cost FOG has on their operating budgets and infrastructure. Given financial constraints faced by utilities, there is an urgent need to quantify the lifecycle costs of FOG and the cost-savings associated with this beneficial reuse, particularly as regulations continue to limit other disposal options.

The commercialization of algal biodiesel is dependent on the ability to reduce infrastructure costs and real estate footprints for growing algae in ponds or photobioreactors, identify the best strains for commercial production, reduce the energy demands for photobioreactors, and develop low-cost systems for harvesting, dewatering, and extracting oil from the algae. Many private companies are tackling these challenges, and pilot studies should be undertaken in partnership with these companies to accelerate the application of this technology in the wastewater industry.

In general, the lack of visible installations and familiarity with renewable energy technologies can lead to perceptions of greater technical risk than is merited. Building awareness within the industry is important component of adoption.

References


Nelson, Yarrow. “Production of Biodiesel from Algae applied to Agricultural Wastewater Treatment.” EPA National Center for Environmental Research. (2007).
3.5.2 Student Members may not retain this class of membership beyond the first anniversary date following termination of qualification as a Student Member.

7.3 Eligibility to Serve on the Board of Directors
7.3.1 Any member of the Association in good standing who resides in Arizona shall be eligible to hold an elective office in the Association.

7.3.2 Board Members must also be a member in good standing of the AWWA and WEF.

7.3.3 Two or more offices may not be held by the same individual.

7.4 Nominations for Members of the Board of Directors
7.4.1 The Association shall conduct an appropriate nomination and election process for the following members of the Board of Directors: President, President Elect, Vice President, Secretary, Treasurer, Immediate Past President, AWWA Director, and WEF Delegate. The Nominating Committee shall consist of a minimum of five (5) members in accordance with the Association’s Policies and Procedures.

7.4.2 A Nominating Committee shall be appointed by the President for all elected positions other than AWWA Director and WEF Delegate. The Nominating Committee shall consist of a minimum of five (5) members in accordance with the Association’s Policies and Procedures.

7.4.3 The Nominating Committee shall select a minimum of one (1) name for each vacant office for the ensuing Association year. Notice shall be sent to all voting members at least 60 days prior to the actual election, by announcement. The Nominating Committee shall review all nominations to determine eligibility and willingness to serve. All eligible names will be forwarded to the President for review and action by the Board of Directors. The Nominating Committee shall submit a minimum of one (1) name for each vacant office for the ensuing Association year. Notice shall be sent to all voting members at least 30 days prior to voting at the annual business meeting.

7.5 Election of Members of the Board of Directors
7.5.1 All members of the Association in good standing are eligible to vote in an election for members of the Board of Directors.

7.5.2 Members of the Board of Directors shall be elected at the annual business meeting by a two-thirds (2/3) vote of the eligible voting members present.

7.6 Terms of Office for Board of Directors
ARTICLE VIII - COMMITTEES

8.1 The Board of Directors may establish standing committees to conduct Association programs and business.

8.2 The Board of Directors has the authority to dissolve standing committees.

8.3 Standing committees shall be established and shall convene in accordance with the Association's Policies and Procedures.

ARTICLE IX - MEETINGS

9.1 Board of Director Meetings

9.1.1 Regular meetings of the Board of Directors shall be held periodically within the State of Arizona at a time and place to be designated by the President.

9.1.2 A quorum of the Board of Directors shall consist of a majority of its members. No member shall have more than one vote.

9.2 Regular Meetings

9.2.1 The Association shall hold at least one (1) annual business meeting in each fiscal year. This meeting shall be held at the same time and place as the annual conference meeting of the Association. The time and place of all meetings of the Association shall be fixed by the Board of Directors or by a committee appointed by them.

9.2.2 Fifteen (15) eligible voting members present in person shall constitute a quorum for the Association's annual business meeting.

ARTICLE X - AMENDMENTS TO BYLAWS

10.1 The Board of Directors will approve proposed Bylaw amendment(s) prior to bringing them to the vote of the membership.

10.2 These Bylaws may be amended at any annual business meeting of the Association by a two-thirds (2/3) vote of eligible voting members present at the meeting, provided however that all members shall have written notice at least 30 days in advance in which to consider the proposed amendments(s) prior to voting.

10.3 At the discretion of the Board of Directors, the Bylaws may also be amended by a mailed ballot with an affirmative vote of two-thirds (2/3) of ballots returned by eligible voting members. All eligible voting members shall be provided a copy of the proposed amendment(s) with the mailed ballot and shall be given at least 30 days to return the ballot.

ARTICLE XI - DISSOLUTION

11.1 In case of dissolution of the Association, such portions of the funds or property thereof in the hands of the Secretary and Treasurer, as may have been derived from the general funds of the AWWA and WEF, shall be returned to the respective organization.

11.2 The balance of the Association funds or property shall be disposed of by transfer and distribution to any one or more corporations, funds, or foundations with like purposes or goals.

11.3 The receiving organization shall: (a) be operated exclusively for scientific or educational purposes,
11.4 Such receiving organization(s) shall be selected by vote of two-thirds (2/3) of the members of the Association at a meeting called for this purpose, or if for any reasons such disposition cannot be affected, then such funds shall be so distributed pursuant to the order, judgment, or decree of a court having jurisdiction over the assets and property of the Association.

ARTICLE XII - INDEMNIFICATION

12.1 Each member, officer, and director of the Association shall be indemnified by the Association against all expenses and liabilities, including attorney’s fees, or any settlement thereof, reasonably incurred by or imposed upon him in any proceeding to which he may be a party, or in which he may become involved solely by reason of his being or having been a member, officer, or director of the Association, whether or not he is a member, officer or director of the Association at the time such expenses are incurred, except in such cases wherein such person is adjudged guilty of willful malfeasance in the performance of his duties; provided that in the event of a settlement, the indemnification shall apply only when the Board of Directors approves such settlement and reimbursement as being in the best interest of the Association.

CONSTITUTION AND BYLAWS OF THE ARIZONA WATER ENVIRONMENT ASSOCIATION

ARTICLE I - NAME & AFFILIATION

1.1 The name of the organization shall be the Arizona Water Environment Association, LLC hereinafter designated the “Association”.

1.2 The Association shall be a member association of the Water Environment Federation, hereinafter designated “WEF”, and shall participate in the activities of that organization. It is the Intent that the Constitution and Bylaws of this Association shall be in harmony with the Constitution and Bylaws of WEF.

ARTICLE II - OBJECTIVES

2.1 Advance the fundamental knowledge of the water environment, its basic qualities, and physical laws governing its interaction with other aspects of the environment and with the aesthetic, economic, and biological needs of the earth’s inhabitants.

2.2 Advance the knowledge and technology in the design, construction, operation and management of water quality systems and facilities.

2.3 Increase the knowledge and understanding of the earth’s water environment, and encourage and promote action necessary for its enhancement.

2.4 Promote sound policy in matters relating to the water environment.

2.5 Improve the professional status of all personnel engaged in any aspect of protecting and improving the earth’s water environment.

2.6 Strengthen and build alliances with organizations dedicated to the preservation and enhancement of water quality and water resources.

2.7 Stimulate public awareness of the relationship of water resources to the public welfare and the need for pollution prevention, resource recovery, preservation, conservation, and reuse of water resources.

ARTICLE III - GEOGRAPHICAL BOUNDARIES

3.1 The exclusive service area of the Association shall consist of the State of Arizona.

ARTICLE IV - HEADQUARTERS

4.1 The headquarters of the Association shall be designated by the Association’s Board of Directors.

ARTICLE V - MEMBERSHIP

5.1 The membership of the Association shall consist of persons and organizations interested in any of the objectives of the Association, residing in or maintaining a place of business in the State of Arizona.

6.1 Membership Classes - shall include all classes of membership designated by the WEF and other categories of membership established by the Association.

6.1.1 Individual Member

Any individual interested in the advancement of knowledge relating to the objectives of WEF. Individual Members shall have all the rights and privileges granted by the WEF including the right to vote and to hold office as provided for in the WEF Constitution and Bylaws.

6.1.2 Group Member

Any group or organization interested in the advancement of knowledge relating to the objectives of WEF. Group Members shall have all the rights and privileges granted by the WEF, including the right of its authorized representative to vote, as provided for in the WEF Constitution and Bylaws.

ARTICLE VI - MEMBERSHIP CLASSIFICATIONS, QUALIFICATIONS, AND PRIVILEGES

8.1 The affairs of the Association shall be conducted by a Board of Directors hereinafter designated as the Board, under such rules as the Board may determine, in keeping with the intent of this document.

8.2 The Board shall be eligible members of the Association and consist of a President, President Elect, Vice President, Secretary, Treasurer, Immediate Past President, WEF Delegate(s), and such additional Directors as deemed necessary for the proper functioning of the Association. The WEF Delegate(s) shall serve as a member of the WEF House of Delegates.

8.3 The Board officers shall be the President, President Elect, Vice President, Secretary, Treasurer, Immediate Past President, and WEF Delegate(s).

8.4 The WEF Delegate(s) shall represent the Association in the conduct of all business by the WEF House of Delegates for a term of service designated by the WEF Constitution and Bylaws, and be a member of the Water Environment Federation.

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ARICLE IX - ELECTION & NOMINATION OF BOARD OF DIRECTORS

9.1 Any member of the Association shall be eligible to hold an elective office in the Association, except dual members whose primary membership is not in Arizona.

9.2 Two or more offices may not be held by the same individual.

9.3 The Association shall conduct an appropriate nomination and election process for the following members of the Association Board of Directors: President, President Elect, Vice President, Secretary, Treasurer, WEF Delegate(s), and Directors.

9.4 The WEF Delegate(s) shall be nominated and elected in a manner consistent with the Constitution and Bylaws of the WEF.

9.5 A Nominating Committee shall be appointed by the President for all elected positions other than WEF Delegate(s). The Nominating Committee shall consist of a minimum of five (5) members in accordance with the Association’s Policies and Procedures. In the year preceding the end of the current WEF Delegate(s) term of office, a Nominating Committee for the WEF Delegate(s) shall be organized. The Nominating Committee for the WEF Delegate(s) shall consist of the outgoing WEF Delegate(s) and the past two WEF Delegates.

9.6 The Nominating Committee shall ask for nominations to be submitted to the Committee at least 60 days prior to the actual election, by announcement. The Nominating Committee shall review all nominations to determine eligibility and willingness to serve. All eligible names will be forwarded to the President for review and action by the Board of Directors. The Nominating Committee shall submit a minimum of one (1) name for each vacant office for the ensuing Association year. In the last year of the three-year term of the currently serving WEF Delegate(s), the Nominating Committee for the WEF Delegate(s) shall review candidates and forward a minimum of one (1) name for the new WEF Delegate(s) to the President for review and action by the Board of Directors. Notice shall be sent to all voting members at least 30 days prior to voting at the annual business meeting.

9.7 Members of the Association Board of Directors shall be elected at the annual business meeting by a two-thirds (2/3) vote of the eligible voting members present.

ARTICLE X - TERMS OF BOARD OF DIRECTORS

10.1 The term of the President, President Elect, Vice President, Immediate Past President, and Directors shall be one (1) year, with an understanding that a three (3) year commitment is involved for Directors, and each year’s term is subject to re-election. Term of office shall commence on the first day of the month following the Association’s Annual Conference is held.

10.2 The term of Secretary and Treasurer shall be three (3) years. Term of office shall commence on the first day of the month following the month in which the Association’s Annual Conference is held.

10.3 The WEF Delegate(s) shall be elected for a three (3) year term and shall be eligible to serve a subsequent three (3) year term if so elected or appointed by the Association. The WEF Delegate(s) shall take office as determined by the annual business meeting of the WEF.

10.4 In the case of a vacancy in the office of the President, President Elect, Vice President, Immediate Past President, Secretary, Treasurer, and other Directors, the Association Board of Directors shall appoint a suitable replacement to complete the term of the vacant position.

10.5 In the case of vacancy in the office of the WEF Delegate(s), a successor to serve for the remainder of the term shall be selected by the Association Board of Directors. The Association shall notify the WEF of such selection.

ARTICLE XI - REMOVAL AND RESIGNATION

11.1 At a properly called regular or special meeting, any officer, director, committee chair, member, or other agent of the Association may be removed by a two-thirds (2/3) vote of the Board of Directors whenever in the judgment of the Board, the best interests of the Association will be served thereby; but such removal shall be without prejudice to the contract rights, if any, of the person(s) so removed.

11.2 Any director, committee chair, or other agent of the Association may resign at any time by giving written notice to the President of the Association Board of Directors. Acceptance of such resignation shall not be necessary to make it effective unless the notice so provides.

ARTICLE XII - MEETINGS

12.1 The Association shall hold at least one (1) annual business meeting in each fiscal year. This meeting shall be held at the same time and place as the Annual Conference meeting of the Association. The time and place of all meetings of the Association shall be fixed by the Association Board of Directors.

12.2 Fifteen (15) members present in person shall constitute a quorum for the Association’s annual business meeting.

12.3 The Association officers and/or Board of Directors shall meet at least once each year to conduct the business of the Association.

ARTICLE XIII - COMMITTEES

13.1 The Association Board of Directors may establish standing committees to conduct WEF and Association programs and business.

13.2 Standing Committees shall be established and shall convene in accordance with the Association’s Policies and Procedures.

13.3 Association Board of Directors has the authority to dissolve standing committees.

ARTICLE XIV - AMENDMENTS

14.1 The Association Board of Directors will approve proposed Constitution and Bylaw amendments prior to bringing them to the vote of the membership.

14.2 The Constitution and Bylaws may be amended at any annual business meeting of the Association by a two-thirds (2/3) vote of eligible voting members present at the meeting, provided however that all members shall have written notice at least 30 days in advance in which to consider the proposed amendment(s) prior to voting.

14.3 At the discretion of the Association Board of Directors, the Constitution and Bylaws may also be amended by a mailed ballot with an affirmative two-thirds (2/3) vote of the ballots returned by eligible voting members. All eligible voting members shall be provided a copy of the proposed amendment(s) with the mailed ballot and shall be given at least 30 days to return the ballot.

14.4 An amendment approved by the Association membership and by the WEF House of Delegates shall take effect immediately.

ARTICLE XV - DISPOSITION OF ASSETS UPON DISSOLUTION

15.1 In the event of dissolution of the Association, the property and assets thereof, after providing for all obligations and liabilities of the Association, shall then be disposed of exclusively for the purposes of the Association in such manner, or to such organizations exempt from taxation under Section 501(c) (3) of the Internal Revenue Code as shall be determined by the Board of Directors.

ARTICLE XVI - INDEMNIFICATION

16.1 Each member, officer, and director of the Association shall be indemnified by the Association against all expenses and liabilities, including attorney’s fees, or any settlement thereof, reasonably incurred by or imposed upon him in any proceeding to which he may be a party, or in which he may become involved solely by reason of his being or having been a member, officer, or director of the Association, whether or not he is a member, officer or director of the Association at the time such expenses are incurred, except in such cases wherein such person is adjudged guilty of willful malfeasance in the performance of his duties; provided that in the event of a settlement, the indemnification shall apply only when the Board of Directors approves such settlement and reimbursement as being in the best interest of the Association.
ARTICLE I - NAME

1.1 The name of this organization shall be the Arizona Section of the American Water Works Association, LLC (hereinafter the “Section”. The American Water Works Association shall hereinafter be referred to as the “Association.”

ARTICLE II - OBJECTIVES

2.1 The objectives of the Section are to promote public health, safety and welfare through the improvement of the quality and quantity of the water delivered to the public by (a) advancing knowledge related to the design, construction, operation and management of all water utility systems of every kind and description; (b) formulating solutions to the problems involved in the development of water resources and in the production and distribution of safe and adequate water supplies; and (c) educating the public on matters connected with the water utility industry.

ARTICLE III - MEMBERSHIP

3.1 The membership of the Section shall consist of those members of the American Water Works Association (designated as the “Association”) residing in or having principal business activity in the Arizona Section, multi-section members, and those assigned to the Section by the Executive Director of the Association.

3.2 The geographic boundaries of the Arizona Section are defined as the State of Arizona.

ARTICLE IV - HEADQUARTERS AND OPERATIONS

4.1 The headquarters of the Section shall be designated by the Section Board of Trustees.

4.2 All matters pertaining to the operation of the Section shall be in accordance with the Articles of Incorporation, Bylaws, and Governing Documents of the Association, and with these Bylaws and policies and procedures of the Section.

ARTICLE V - ELIGIBILITY TO VOTE

5.1 All members of the Section in good standing, including multi-section members, are eligible to vote in accordance with the Bylaws and Governing Documents of the Association and with these Bylaws and Policies and Procedures of the Section.

5.2 Occasions where a vote of the membership is required include: the election of Section officers and/or other members of the Section Board of Trustees, approval of a proposed amendment of these Bylaws, approval of a special dues assessment of the Section membership, or in any other event for which the Board of Trustees requires a vote of the Section membership.

ARTICLE VI - SECTION FINANCES

6.1 Dues

6.1.1 Dues shall be assessed against members as required for membership in the Association.

6.1.2 The Section may, in accordance with the procedures defined in the Governing Documents of the Association, apply for permission to levy a Section dues assessment. The Section assessment would be levied annually at the time of membership renewal, and the revenue collected would be used to increase the funds available for Section uses, consistent with the Association objectives and policies. Once approved, the changes in a section assessment can be authorized by a vote of the Section Board of Trustees for submission and approval by the Association Board of Directors.

6.2 Fees

6.2.1 The Section reserves the right to collect fees for Section activities and events, as appropriate (e.g., registration fees for annual meetings and other educational programs). Such fees will be established in accordance with these Bylaws, the Policies and Procedures of the Section, and the Bylaws and Governing Documents of the Association.

6.3 Financial Controls

6.3.1 All Section finances shall be managed in accordance with these Bylaws, Policies and Procedures of the Section, and the Bylaws and Governing Documents of the Association, and all applicable financial rules and regulations of the State of Arizona.

6.3.2 The Section shall conduct, on an annual basis, an independent audit of all Section finances. The audit shall be conducted by a qualified financial advisor who is neither an employee of the Section nor member of the Board of Trustees.

ARTICLE VII - SECTION GOVERNANCE

7.1 Authority and Purpose of the Section Board of Trustees

7.1.1 The Section is an autonomous entity and has the authority to govern the operation of the Section and to be consistent with the Articles of Incorporation, Bylaws, and Governing Documents of the Association.

7.2 Structure of the Section Board of Trustees

7.2.1 The Section shall have a governing board, which will constitute a Board of Trustees consisting of a Chair, Chair-Elect, Vice-Chair, Secretary, Treasurer, Immediate Past-Chair, AWWA Director, and such Trustees as deemed necessary for the proper functioning of the Section.

7.3 Eligibility to Serve on Section Board of Trustees

7.3.1 Any member of the Section including multi-section members shall be eligible to hold an elective office in the Section. Multi-section members may only hold office in one Section at a time.

7.3.2 Two or more offices may not be held by the same individual.

7.4 Nominations for Members of the Section Board of Trustees

7.4.1 The Section shall conduct an appropriate nomination and election process for the following members of the Section Board of Trustees: Chair, Chair-Elect, Vice-Chair, Secretary, Treasurer, AWWA Director, and Trustees.

7.4.2 The AWWA Director shall be nominated and elected in a manner consistent with Article III of the Bylaws of the Association.

7.4.3 A Nominating Committee shall be appointed by the Chair for all elected positions other than AWWA Director. The Nominating Committee shall consist of a minimum of five (5) members in accordance with the Section’s Policies and Procedures. In the year preceding the end of the current AWWA Director’s term of office, a Nominating Committee for a new AWWA Director shall be organized. The Nominating Committee for the AWWA Director shall consist of the outgoing AWWA Director and the most recent past two AWWA Directors.

7.4.4 The Nominating Committee shall ask for nominations to be submitted to the Committee at least 60 days prior to the actual election, by announcement. The Nominating Committee shall review all nominations to determine eligibility and willingness to serve. All eligible names will be forwarded to the Section Chair for review and action by the Section’s Board of Trustees. The Nominating Committee shall submit a minimum of one (1) name for each vacant office for the ensuing Section year. In the last year of the three-year term of the currently serving AWWA Director, the AWWA Director Nominating Committee shall review candidates and forward a minimum of one (1) name for the AWWA Director to the Chair for review and action by the Board of Trustees. Notice shall be sent to all voting members at least 30 days prior to voting at the annual business meeting.

7.5 Election of Members of the Section Board of Trustees

7.5.1 Members of the Section Board of Trustees shall be elected at the annual business meeting by a two-thirds (2/3) vote of the eligible voting members present.

7.6 Terms of Office for Section Board of Trustees

7.6.1 The AWWA Director shall be elected for a term of three years or as otherwise required by the Bylaws of the Association. The term shall commence at the Association’s Annual Conference Board of Directors Meeting.

continued on page 62
7.6.2 The term of the Chair, Chair-Elect, Vice-Chair, and Trustees shall be one (1) year, with the understanding that a three (3) year commitment is involved for Trustees, and each year's term is subject to re-election. Terms of office shall commence on the first day of the month following the month in which the Section's Annual Conference is held.

7.6.3 The term of Secretary and Treasurer shall be three (3) years. Terms of office shall commence on the first day of the month following the month in which the Section's Annual Conference is held.

7.6.4 The term of Immediate Past-Chair shall be for one (1) year. Term of office shall commence on the first day of the month following the month in which the Section's Annual Conference is held.

7.7 Vacancies on Section Board of Trustees

7.7.1 In the case of a vacancy in the office of the AWWA Director, a successor to serve for the remainder of the term shall be selected by the Section Board of Trustees, as described in Article III of the Association Bylaws. The Section shall notify the Executive Director of the Association of such selection.

7.7.2 In the case of a vacancy in the office of the Chair, Chair-Elect, Vice-Chair, Secretary, Treasurer, Immediate Past-Chair, and Trustees, the Section Board of Trustees shall appoint a suitable replacement to complete the term of the vacant position.

7.8 Duties of Section Board of Trustees

7.8.1 The AWWA Director shall represent the Section on the Board of Directors of the Association, and shall act to work with the Chair and other members of the Section Board of Trustees to coordinate and unify the actions of both the Association and the Section.

7.8.2 The duties of the members of the Section Board of Trustees shall be defined in the Section's Policies and Procedures.

7.9 Removal and Resignation

7.9.1 At a properly called regular or special meeting, any officer, director, committee chair, member, or other agent of the Association may be removed by a two-thirds (2/3) vote of the Board of Trustees whenever in the judgment of the Board, the best interests of the Section will be served thereby; but such removal shall be without prejudice to the contract rights, if any, of the person(s) so removed.

7.9.2 Any director, committee chair, or other agent of the Association may resign at any time by giving written notice to the Chair of the Section Board of Trustees. Acceptance of such resignation shall not be necessary to make it effective unless the notice so provides.

ARTICLE VIII - COMMITTEES

8.1 The Section Board of Trustees may establish standing committees to conduct Association and Section programs and business.

8.2 The Section Board of Trustees has the authority to dissolve standing committees.

8.3 Standing committees shall be established and shall convene in accordance with the Section's Policies and Procedures.

ARTICLE IX - MEETINGS

9.1 The Section shall hold at least one (1) annual business meeting in each fiscal year. This meeting shall be held at the same time and place as the annual conference meeting of the Section. The time and place of all meetings of the Section shall be fixed by the Section Board of Trustees or by a committee appointed by them.

9.2 Fifteen eligible voting members present in person shall constitute a quorum for the Section's annual business meeting.

9.3 The Section officers and/or the Section Board of Trustees shall meet at least once each year to conduct the business of the Section.

ARTICLE X - AMENDMENTS TO SECTION BYLAWS

10.1 The Section Board of Trustees will approve proposed Bylaw amendment(s) prior to bringing them to the vote of the membership.

10.2 These Bylaws may be amended at any annual business meeting of the Section by a two-thirds (2/3) vote of eligible voting members present at the meeting, provided however that all members shall have written notice at least 30 days in advance in which to consider the proposed amendment(s) prior to voting.

10.3 At the discretion of the Section Board of Trustees, the Bylaws may also be amended by a mailed ballot with an affirmative vote of two-thirds (2/3) of ballots returned by eligible voting members. All eligible voting members shall be provided a copy of the proposed amendment(s) with the mailed ballot and shall be given at least 30 days to return the ballot.

10.4 If the amendment(s) are approved by the Section membership, the Section shall submit the amendment(s) to the Executive Director of the Association for approval by the Association Board of Directors.

10.5 Corrections deemed insubstantial (grammar, punctuation) may be made at the discretion of the Association Board of Directors. The Section Board of Trustees will be advised of these corrections and may call for a vote of the Section.

10.6 Amendment(s) shall be effective only after receiving notice from the Association Executive Director that the amendment(s) have been approved by the Association Board of Directors.

ARTICLE XI - DISSOLUTION

11.1 In case of dissolution of the Section, such portions of the funds or property thereof in the hands of the Secretary and Treasurer, as may have been derived from the general funds of the Association, shall be returned to the Association.

11.2 The balance of the Section funds or property shall be disposed of by transfer and distribution to any one or more corporations, funds or foundations with like purposes or goals that is organized and operated in an area included in an AWWA Section, hereinafter referred to as the “receiving organization.”

11.3 The receiving organizations shall:
(a) be operated exclusively for scientific or educational purposes,
(b) not be conducted or operated for profit, and
(c) not be operated such that a substantial part of the activities of which is carrying on propaganda or otherwise attempting to influence legislation, and not participate in, or intervene in (including the publishing or distributing of statements) any political campaign on behalf of any candidate for public office.

The receiving organization would then qualify under the provisions of Section 501(c)(3) of the United States Internal Revenue Code as they now exist or as they may hereinafter be amended.

11.4 Such receiving organization(s) shall be selected by vote of the majority of the members of the Section at a meeting called for this purpose, or if for any reason such disposition cannot be affected, then such funds shall be so distributed pursuant to the order, judgment or decree of a court having jurisdiction over the assets and property of the Section.

ARTICLE XII – INDEMNIFICATION

12.1 Indemnification is provided by the Association as described in the Association Bylaws, Article VI, Section 6.0.1.

VOTE!

Bylaw Amendments
Board Member Nominations

ANNUAL BUSINESS MEETING

May 5, 1:00-1:30pm
Renaissance Glendale Hotel
Glendale, AZ
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**WASTEWATER COLLECTION GRADES 1 & 2**

**WASTEWATER COLLECTION GRADES 3 & 4**

**WASTEWATER TREATMENT GRADES 1 & 2**

**WASTEWATER TREATMENT GRADES 3 & 4**

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