

WEDNESDAY, MAY 5

OPENING GENERAL SESSION/ KEYNOTE/PANEL DISCUSSION

8:00 – 9:45am

In response to the growing recognition that the future of Arizona's water supplies is strongly linked to the future of our energy resources, and in recognition that our conference is during the National Drinking Water Week, we have developed an outstanding program for our Opening General Session.

WELCOME

Conference participants will be welcomed by AZ Water President, Mr. Don Manthe and by the Mayor of the City of Glendale, the Honorable Elaine Scruggs.

KEYNOTE AND PANEL DISCUSSION

Central Arizona Project, General Manager David Modeer will address us on water and energy issues at CAP. Finally, AZ Water Board Member Marie Pearthree, an Assistant General Manager at CAP, will moderate a panel of experts who will help us better understand the deep connections between Arizona's water and power industries. Join us for an interesting and timely discussion on where we are headed in providing water supplies for the future of Arizona.

TRACK 1 - MODELING OF WATER RESOURCES

1:00 - 1:30pm

Hydraulic Modeling - Yesterday, Today and Tomorrow
Dr. Sasa Tomic, PhD, PE, HDR Engineering, Inc.

Hydraulic models can help utilities manage, operate, and optimize every aspect of the system. Countless hydraulic models have been developed to address problems ranging from master planning to real-time operation optimization. It is surprising to see how rarely these models are maintained and utilized to help in everyday management of the system. In the simplest definition, a sustainable modeling system is one that is used in the everyday decision making process of a utility. Such systems continue to deliver returns on the original investment through improved system management, optimized energy use, and higher level of emergency preparedness. This continued return on investment provides clear justification for the ongoing model maintenance to ensure the accuracy and applicability of the results.

1:30 - 2:00pm

Groundwater Action Plan and Well Field Planning, Sahuarita Water Company

Mr. Buck Schmidt, BasinWells Associates

To meet the challenge of groundwater quality, a Groundwater Action Plan (GAP) was developed by the groundwater resource team of BasinWells Associates, to form the basis of well field planning for Sahuarita Water Company, Arizona. The uniquely developed GAP methodology provided an optimal, unbiased, and comprehensive plan. Potential well field improvements included well rehabilitation and new installations. Conditions and characteristics of existing wells were assessed along with hydrogeologic and regulatory constraints in siting new wells. New well installations were recommended for existing wells in poor condition at or near useful well life. Pilot hole and exploratory boring analyses were performed to form the basis of siting new water supply wells that develop groundwater with optimum groundwater quality and yield.

2:00 - 2:30pm

Water Distribution Modeling as a Decision Making Tool - Three Case Studies

Ms. Karla Lu, City of Phoenix

In recent years, the City of Phoenix water system hydraulic and water quality models have been increasingly implemented as decision-making tools to predict, prevent and control the water system behavior during future shutdowns of water treatment plants and water distribution facilities. You will hear three case studies present three distinct scenarios revealing why water system hydraulic and water quality models are fast becoming an integral preliminary step and are playing an important role when making high risk decisions in design, closure, and rehabilitation of water distribution facilities and water treatment plants. Hydraulic and water quality model applications are now central in facilitating strategies during implementation of the water distribution system.

TRACK 1 - WATER RESOURCES

3:30 - 4:00pm

Resolution Copper Mining Dewatering, Conveyance and Beneficial Reuse – Part 1: Design, Construction, and Operation of a 26-Mile Pipeline to Convey Treated Groundwater to the New Magma Irrigation District

Mr. Ty Morton, CH2M HILL

Resolution Copper Mining constructed a 26-mile pipeline to supply treated groundwater from their mine dewatering operations to the New Magma Irrigation District for supplemental water supply. This challenging project entailed constructing this HDPE dewatering pipeline to operate under gravity flow conditions over a 1,400 foot drop in elevation and in difficult terrain. A significant portion of the project was completed in U.S. Forest Service property that offered limited construction access and required minimal environmental disturbance. This presentation will be given in conjunction with Resolution Copper Mining Dewatering, Conveyance and Beneficial Reuse – Part 2: A Blending and Beneficial Agricultural Reuse Program for Treated Mine Water At New Magma Irrigation District.

4:00 - 4:30pm

Resolution Copper Mining Dewatering, Conveyance and Beneficial Reuse – Part 2: A Blending and Beneficial Agricultural Reuse Program for Treated Mine Water at New Magma Irrigation District

Dr. Joel Kimmelshue, Ph.D, NewFields Agricultural & Environmental Resources

Resolution Copper Mining, LLC (RCM) has partnered with New Magma Irrigation and Drainage District (NMID), the University of Arizona Department of Soil, Water and Environmental Science, and NewFields Agricultural & Environmental Resources, in an effort to dewater an existing underground copper mine in Superior, Arizona. Through dewatering operations, RCM provides supplemental treated water for crop irrigation to NMID via a 27-mile pipeline. This supplemental treated water is blended with Central Arizona Project water, to provide water that is suitable for irrigation of crops (alfalfa, cotton and turf) grown within NMID. This presentation will be given in conjunction with Resolution Copper Mining Dewatering, Conveyance and Beneficial Reuse – Part 1: Design, Construction, and Operation of a 26-mile Pipeline to Convey Treated Groundwater to the New Magma Irrigation District.

4:30 - 5:00pm

Yuma Desalting Plant Pilot Run – Status Reports Significant Outcome

Ms. Jennifer McCloskey, City of Yuma

5:00 - 5:30pm

FutureH2O – New Research Initiatives of Water Quality Improvement Center

Ms. Angela Adams, Bureau of Reclamation, Water Quality Improvement Center

This presentation provides an overview of the Bureau of Reclamation's Water Quality Improvement Center (WQIC) research program and describes its current roles and challenges in conducting research. It introduces a new WQIC initiative titled "FutureH2O", focusing on smart, sustainable water storage/supply and water/wastewater treatment infrastructure. Detailed information regarding this research initiative such as research priorities and funding sources will be discussed.

TRACK 2 - WATER RECLAMATION

1:00 - 1:30pm

Cave Creek WRF

Mr. Roger Greaves, Burns & McDonnell

The Town of Cave Creek's existing wastewater treatment plant is located in the middle of an affluent neighborhood, with minimal setbacks and minimal odor control. As the Town of Cave Creek contemplated building a new water reclamation facility, a simple but challenging set of criteria was devised, "We don't want to see it, hear it, or smell it." These were the marching orders given to the design/build team.

1:30 - 2:00pm

Start-up of the City of Peoria's Butler Drive

Mr. Robert Garcia, City of Peoria

Learn the steps and procedures that the City of Peoria operations staff and Black and Veatch took to prepare the Butler Drive Water Reclamation Facility (BDWRF) during start-up. The BDWRF is a 10 MGD water reclamation facility located at 79th Avenue and Olive. The BDWRF is unique due to having an Influent Pump Station (IPS) that pumps wastewater over two miles. The scope of the BDWRF start-up encompassed a new IPS and membrane treatment plant within a four week period from start to finish.

2:00 - 2:30pm

Minimization of Disinfection Byproducts through the Investigation of Step Feed and Sequential Chlorination at the Ina Road Wastewater Reclamation Facility

Ms. Jennifer Phillips, CH2M HILL

The Pima County Regional Wastewater Reclamation Department will implement enhanced chlorination at the Ina Road WRF to achieve E. coli inactivation of secondary effluent, based on recommendations from the Regional Optimization Master Plan. Testing indicated that use of free chlorine at a design CT of 100 minutes * mg/L would not consistently meet the 100 ug/L regulatory limit for Trihalomethanes (THMs) during minimum flow conditions. Combined chlorine minimizes THM production, but increases the formation of N-Nitrosodimethylamine (NDMA). Hear the results from step feed and sequential chlorination bench-scale tests, and recent research by Los Angeles County Sanitation District.

2:30 - 3:00pm

Occurrence, Control, and Treatment of NDMA at the Scottsdale Water Campus

Mr. Benjamin W. Lee, PE, Water Works Engineers

This presentation provides an overview of NDMA occurrence and formation at the Scottsdale Water Campus as well as bench scale chloramination and ozone pilot testing results.

TRACK 2 - WASTEWATER TREATMENT

4:00 - 4:30pm

Wastewater Process Optimization: A Non-Traditional Approach

Lance Mason, Brown and Caldwell

The presentation will show traditional parameters used for process optimization and the subjective nature of their use. The primary focus will be the method of "the Goal" which is a manufacturing approach to optimizing a process and how this can be applied to wastewater treatment. Specific examples will be given for successful projects using this approach.

4:30 - 5:00pm

Overview of the Development and Application of a Process Model for Updating the Master Plan for the 91st Avenue WWTP

Mr. Art Umble, Greeley and Hansen

The 91st Avenue Wastewater Treatment Plant (WWTP) treats wastewater from across the central Arizona valley including the Cities of Glendale, Mesa, Phoenix, Scottsdale and Tempe (Cities), which together constitute the Sub-Regional Operating Group (SROG). In 2008, recognizing the value of long-range planning in making timely, cost-effective decisions, SROG retained Greeley and Hansen LLC and CH2M HILL, Inc. to update the 25-Year Facilities Master Plan for the WWTP. One of the key aspects of the master plan was the evaluation of the facilities treatment capacity. To establish treatment capacity, the project team developed a process model using the commercially available GPS-X® simulator package. The presentation will include a framework for simulating the plant's liquid stream unit processes.

5:00 - 5:30pm

Using Process Modeling to Estimate Loss of Biomass Via Foam/Scum from the BNR Membrane Bioreactor at the Kyrene Water Reclamation Plant in Tempe, AZ

Mr. Gustavo Lopez, Greeley and Hansen

Managing the mixed liquor concentration and the overall solids balance in the bioreactor of a BNR treatment process is critical for consistency and predictability in nitrogen removal performance. The membrane bioreactor (MBR) system at the Kyrene Water Reclamation Plant in Tempe, Arizona, currently operates an MLE process to remove nitrogen to meet an imposed effluent nitrate limitation. Hear about the approach devised to use the GPS-X process model to estimate the quantity of foam/scum by calibrating the WAS flowrate and the mass to the actual plant data and balancing the solids inventory with the corresponding MLSS data in the bioreactor.

TRACK 3 - WATER TREATMENT

1:00 - 1:30pm

Start-up Experience of a 20MGD Ultra Filtration System Plant

Mr. Mathew Boettcher, City of Scottsdale

This presentation will cover the City of Scottsdale's start up experience with a new membrane filtration plant with Dissolved Air Floatation as pretreatment for the facility.

1:30 - 2:00pm

Getting Things Done – A Team Approach to a Successful Start-up, at the Glendale Oasis Surface Water Plant

Ms. Dawn Slaughter, City of Glendale

An atomic glance at a new water treatment facility inauguration that produced impressive results due to flexible collaboration and impressive working relationship among City leadership, City operational staff, Engineers and Contractors will be presented.

2:00 - 2:30pm

Alum and Ferric: Metal Equivalent Observations During Chlorine Dioxide Demonstration Testing

Mr. Ken Garrison, City of Phoenix

During the Chlorine Dioxide Demonstration Testing at the Deer Valley WTP, bench scale tests were performed to determine metal equivalent equilibrium and its interference on sludge blanket characteristics in the Gravity Thickeners when ferric and alum metals were simultaneously added to the flow stream. Maximum interference was found when the metal equivalents were approximately equal leading to light and fluffy sludge with lower sludge density.

3:30 - 4:00pm

Putting New Systems through their Paces: Start-Up of Multiple Treatment Processes at the Johnny G. Martinez Water Treatment Plant

Mr. Mark Urban, Carollo Engineers

At the City of Tempe's Johnny G. Martinez WTP, two recent CM@R projects have provided several new or upgraded treatment processes. The new facilities include a 12-MG finished water reservoir, finished water pump station, ultraviolet (UV) disinfection system, gravity thickener, gravity plate settlers, and solids polymer feed system. Rehabilitated facilities include a wash water recovery basin and pump station, filter press feed pumps, filter press washer system, and chemical feed systems. Additionally, the existing RTUs are being replaced to upgrade remote control, monitoring and process automation. The overall objective of the new facilities is to improve plant performance, reduce disinfection by-products, and increase automation.

4:00 - 4:30pm

Process Selection for the New Mesa Signal Butte CAP Water Treatment Plant

Ms. Teresa Smith-DeHesus, Black & Veatch

The Mesa Signal Butte CAP WTP will be a new 30 mgd treatment facility located in southeast Mesa, scheduled to begin operations in 2014. Process selection for a new water treatment facility can be a complicated endeavor. Multiple stakeholders are involved, and the selected process train needs to meet many objectives, including redundancy, flexibility, ease of operation, initial cost, and operational costs. This presentation will focus on the range of technologies considered, the criteria used to select the process train components, the interplay of construction costs and operational costs, and the choices that the City made in order to define the process for their new water treatment plant.

4:30 - 5:00pm

Sahuarita Treatment Plant No. 1

Ms. Kristen L. Whatley, P.E., WestLand Resources, Inc.

WestLand Resources and the Sahuarita Water Company embarked on a fast paced design build project to construct an arsenic treatment facility that utilized a newly manufactured regenerable adsorptive media that met both NSF and ADEQ requirements. Extensive coordination was required with many design professionals, water company staff, vendors, contractors, and regulators to accomplish this overwhelming task in what seemed an impossible time frame. In addition, the project was also able to take advantage of Federal Stimulus grants and financing thus resulting in a reduced financial burden to the end customer for the new facilities. This facility will be the first adsorptive plant to implement the regenerable media, pilot testing was conducted to verify the overall performance against existing disposable media.

5:00 - 5:30pm

Water Tank Rehabilitation for a Small Community

Mr. Ajay Kashi, Gannett Fleming, Inc.

The maintenance of water supply systems in smaller communities is a concern due to lack of funding and insufficient manpower. The USDA-RD financially supported the Bowie Water Improvement District (BWID), Bowie, Arizona to rehabilitate an existing 150,000 gallon water storage tank. The rehabilitation work involved replacement of tank floor, interior and exterior surface coating, and disinfection of interior surface with chlorine solution. The rehabilitation process followed the AWWA D-100 Standard and the ADEQ Engineering Bulletin No.10. This presentation will focus on the logistics, constraints and lessons learned in this project.

TRACK 4 - REGULATORY ISSUES

1:00 - 1:30pm

Proposed Changes to the Total Coliform Rule

Mr. Jason Gambatese, U.S. Environmental Protection Agency, Region IX

Under the Safe Drinking Water Act, EPA is required to review all existing regulations every 6 years. Under a recent review, it was determined that the Total Coliform Rule needed to be revised. EPA has met with stakeholders and developed an agreement in principle which will be the backbone of the proposed Revised Total Coliform Rule which is due out in summer 2010. This presentation will review the agreement in principle.

1:30 - 2:30pm

Arizona Drinking Water Regulatory Issues

Ms. Donna Calderon, Arizona Department of Environmental Quality

ADEQ will provide attendees with updates of the critical deadlines and requirements of the Stage 2 Disinfection by-products rule, with the majority of focus on Schedule 3 and 4 systems that should have submitted, or will submit, their IDSE reports by January 1, 2010 and July 1, 2010 respectively. A brief discussion of the Stage 2 Compliance Monitoring Plans will also be mentioned. With 6 months of experience with implementing the GWR, ADEQ will discuss the experiences they have had with various systems, common problems, reporting mistakes and feedback from labs, Certified Operators and PWSs. ADEQ will cover the 2009 CCR due to your customers no later than July 1, 2010 with the GWR and special notices.

TRACK 4 - WASTEWATER TREATMENT

2:30 - 3:00pm

Reclaimed Water Usage Issues

Mr. Dale Lieb, Stantec Consulting Inc

A review of the performance of the first large scale application of tire chip media in constructed wetland for removing TSS, BOD, fecal coliform from lagoon effluent. The tire chip media wetland removed 80% of CBOD, 88% of TSS and over 96% of fecal coliform. Effluent TSS and CBOD from the wetland were consistently below 10 mg/L, and less than 5 mg/L respectively, on average. The wetland not only enables the Owner to rerate their plant at a higher capacity, but also now serves a new local wildlife habitat.

TRACK 4 - SOCIAL MEDIA

4:00 - 5:30pm

Feeling LinkedIn or Left Out?

Ms. Deirdre Booth, Small Giants

Learn how to leverage the power of social media to increase your ability to communicate with customers/clients, protect your organization's image, and create new connections to increase your personal network. Discover how to create policies and procedures to help you navigate some of the potential problems these mediums can create and practical plans to accommodate even the most time-strapped organizations. Hear from a panel of speakers from both public and private organizations who are realizing results from these free tools and answer your questions about how it can apply to you. There will be a presentation with panel discussion at end.

TRACK 5 - WASTEWATER COLLECTIONS

1:00 - 1:30pm

Sewer Bypass Pumping Design Considerations

Mr. Harrison Steed, Brown and Caldwell

Pipeline rehabilitation via the cured-in-place pipe (CIPP) rehabilitation method is frequently used to extend the life of a deteriorating sewer. This method requires completely dewatering the pipeline to create a new pipe inside of an existing deteriorated pipe. To date, no commonly accepted standard for sewer bypass design criteria has been developed which becomes more significant for medium and large diameter projects. While limiting designer/owner liability is an important part of what an engineer does, there are proactive steps a designer can take on projects requiring bypass pumping to help save the owner money and make projects more successful.

1:30 - 2:00pm

Pipeline to Somewhere – Gilbert's Investment in Collection System Flexibility

Mr. Dan Booker, Wilson Engineers

The Town of Gilbert has taken a significant step towards flexibility in their collection system with the construction of the Gilbert Road Force Main and Sewer. Gilbert originally approached the Gilbert Road Force main as a means to provide redundant pumping capacity at one of the Town's significant lift stations. With further evaluation, Gilbert determined that the force main should also be used to "balance" wastewater flows between Gilbert's two wastewater treatment plants.

2:00 - 2:30pm

Comprehensive Sewer Study for Wickenburg, AZ

Ms. Misti Burkman, CDM

A comprehensive sewer study was prepared to identify necessary improvements to the Town of Wickenburg's sewer system to meet both current and future customer needs through build out. Almost a decade had passed since the previous master plan had been developed. Since that time the Town has experienced significant growth in residential sectors in many different geographical areas within the Town's boundary. To address the increased flows to the existing system, the Sewer Master Plan included hydraulic modeling of current and future planned sewer infrastructure. Hear the results of the hydraulic modeling provided a basis for developing a phased and prioritized Master Plan to provide direction to developers and the Town for necessary infrastructure to accommodate future growth.

2:30 - 3:00pm

Trenchless Technology: Pipe Rehabilitation Using Ultraviolet Light Cured-in-Place Pipe

Mr. Peter Okopny, Dibble Engineering

The Scottsdale Small Diameter Sanitary Sewer Rehabilitation case study will present the engineering, environmental, and construction obstacles encountered within the residential pipe rehabilitation project and the benefits of utilizing UV-CIPP to overcome these constraints. Presented are the lessons learned following two months of installation construction that led to a successful UV-CIPP trenchless project. This presentation will provide a sound basis for building a sustainable infrastructure management program that reduces operations and maintenance costs, improves system capacity, fosters community economic development, and reduces the risk of system failure.

TRACK 5 - CONSTRUCTION

4:00 - 4:30pm

Site Logistics – Coordination of Existing/New Facilities Using 3-D Modeling

Mr. Ron Bongard, McCarthy Building Companies

Learn about the tools used during construction to coordinate the new work inside the existing facilities, in the structures/yard, and the new work that crossed and/or connected to existing facilities. Discussion will focus on how the 3-D model was put together from the extensive pre-construction potholing effort, the surveys done during construction to confirm sleeve locations and how the 3-D model was used for site logistics planning, trade coordination, and the team coordination reviews with the Owner, Engineer, and Contractors to make sure the team was on board with the planning and construction of the facilities.

4:30 - 5:00pm

Coordinating Construction Activities During a Four Month Plant Shutdown

Mr. Venkata J. Yeddanapudi, Wilson Engineers

The City of Phoenix decided to replace the east train in the treatment basins at Deer Valley WTP, due to settling issues. Construction for a new treatment train started in early 2008 after demolition. This presentation will focus on the tie-ins necessary for start-up of the new treatment train scheduled for November 2010. This includes tying in the new treatment train to the existing raw water source, solids handling facilities, chemical facilities and finished water facilities.

TRACK 6 - UTILITY MANAGEMENT

1:00 - 1:30pm

Establishing Design Standards and Performing Technology Assessments for the City of Surprise

Ms. Nicole Tomaszewski, Carollo Engineers

Carollo Engineers performed a Design Standards and Water Technology Assessment Project for the City of Surprise, to provide them with a uniform approach for future water and wastewater infrastructure that meets City and regulatory requirements. The project includes complete drinking water and wastewater technology assessments and developing design standards and guidelines for water and wastewater treatment infrastructure. For the drinking water technology assessment, a customized computer model, SurpriseTree,™ was created to compare water treatment technologies for removal of constituents of concern: arsenic, nitrate and fluoride. Requirements were established for developers during treatment facility design. The guidelines also contain City preferences and standards related to constructing a treatment facility.

1:30 - 2:00pm

Digital Revolution in Water/Wastewater Utility Management

Mr. Gary Lassin, BirdNest

This presentation describes a 21st-century approach to Water/Wastewater utility information management that encompasses all facets of the job, from collecting data in a more direct and accurate way, to using the data to manage day-to-day operations more effectively. We focus on the advantages that a digital data system has offered to users. Three case studies of public and private water/wastewater operators of various sizes illustrate their successes after implementing a digital data system for information management. By attending this session, participants will be better able to evaluate the offerings in the marketplace today for setting up a mobile workforce and identify the stages of implementation for going digital.

2:00 - 2:30pm

System Risk: How Are You Managing It?

Mr. Randy Weaver, GHD Inc.

Guidelines used for identifying and analyzing the potential risk of infrastructure asset will be addressed in this presentation. The purpose of developing a risk model is to highlight those assets that represent a high risk and to develop the appropriate strategy to manage this risk. How to identify the potential risk posed by an asset failure and the key elements to conducting a cost benefit analysis for project evaluations on whether to invest in maintenance, rehabilitation, or replacement options.

2:30 - 3:00pm

Essential Toolkits for a Successful Project Delivery – An Owner's Perspective

Mr. Arif Rahman, City of Glendale

Contrary to the popular notion of project delivery as a "soft science" or "art" at best, it's actually very much quantifiable and has very well defined tools and benchmarks. The purpose of this presentation is to illustrate some of the key toolkits for Project Management that can make or break a project especially as it relates to alternative project delivery. Some of the key areas the presentation will touch upon include: human dimension in project management, project planning, importance of scoping in project delivery, and anatomy of a healthy project including vital signs and stress test.

4:00 - 4:30pm

Creating Innovation and Cost Reduction through Staff Involvement: How the City of Peoria Utilities Department found Opportunity from Within

Ms. Cathy Frost, City of Peoria Public Works

In November 2008, the City of Peoria Utilities Department initiated a process with department staff to brainstorm innovative ideas to reduce costs and find ways to work more efficiently. This presentation will provide a detailed background on the truly innovative approach in which the department engaged employees in the process. And, we will explore some of the major cost savings projects implemented; which saved in capital improvement program money as well as operating budget savings. In addition, a couple of the major projects will be highlighted, how they have impacted the budget, and how they continue to save the department money.

4:30 - 5:00pm

Pima County WRD CIP Delivery Improvement Enhancement Project

Mr. Alan O'Brien, Gannett Fleming, Inc.

Over 90% of the \$1.03 billion Pima County Regional Wastewater Reclamation Department (WRD) CIP is planned to take place in the period from Fiscal Year 2008/09 through 2013/14. Concerned about how to provide the capacity and capability to manage and deliver the projects

given this projected rapid growth in the CIP, they initiated a project to: assess factors influencing delivery; analyze WRD capability and capacity; identify gaps and develop a phased improvement plan. This presentation will discuss the recommended solutions which included modifying the WRD structure, increasing staff resources, revising program management and project delivery processes, and preparing tasks and a schedule for implementation. Modifications have successfully been implemented within WRD.

5:00 - 5:30pm

"I'm in Charge: Now What?"

Mr. Fred L. Kriess Jr., Severn Trent Environmental Services
The water and wastewater utility industry is undergoing a tremendous change with the aging of the baby boomer generation and younger workers entering the workplace. This new generation has different expectations; what worked a few years ago will no longer suffice. We are faced with a diversity of ideas, beliefs, ethnicity and gender in our work environment. This requires a change in leadership practices from asking employees to supervise and manage people based on their technical skills. The author will discuss the importance of employee involvement in decision making, active listening, and goal setting. Actual case histories and "Top Ten Lessons" of leadership are relevant for anyone who finds themselves in a position of leadership responsibility.

THURSDAY, MAY 6

TRACK 1 - BIOSOLIDS MANAGEMENT

8:00 - 10:00am

Moderator: Mr. David Epperson

This two-hour track devoted to biosolids management will begin with an overview of the research taking place at the University of Arizona evaluating endocrine disruptors and prions contamination potentials in biosolids. Then, we will explore how the City of Tolleson is systematically upgrading their solids treatment system to consistently achieve Class B biosolids utilizing federal and state funding as well as a Construction Manager at Risk contracting method. Next, we see how CH2M Hill is working with the City of Phoenix to update their 25 Year Biosolids Master Plan. Finally, the session will end with two presentations related to the ADEQ Annual Biosolids Report: including who needs to file an annual report as well as typical deficiencies found during an annual biosolids inspection.

8:00 - 8:30am

Fate of Chemical and Biological (prions) Emerging Contaminants in Biosolids through Wastewater Reclamation Process and After Land Application

Mr. I.L. Pepper, D.M. Quanrud and C.P. Gerba, University of Arizona

Studies at the University of Arizona evaluated the fate of two emerging contaminants: endocrine disruptors, known to be in Class B biosolids, and prions which have been shown to occur in the environment, and could potentially end up in biosolids. Soils receiving annual applications of Class B biosolids for 20 years were analyzed for the presence of PBDEs and nonylphenol. Data shows that PBDEs which are hydrophobic, sorbed to colloids in the surface soil, and hence were resistant to degradation. Nonylphenol concentrations were low indicating that they had been degraded within the soil. Prions added to biosolids and incubated at 35oC showed 1.5 log inactivation in 15 days compared to 2.5 log inactivation in 10 days when incubated at 60oC.

8:30 - 9:00am

City of Tolleson Wastewater Treatment Plant Solids System Upgrades

Mr. Edmond Low, Brown and Caldwell

Brown and Caldwell planned and designed upgrades and improvements to rehabilitate the Tolleson WWTP solids treatment systems to consistently achieve Class B biosolids, and restore solids treatment and handling capacity. Primary solids treatment improvements included rapid withdrawal primary solids pumps and rotary drum thickeners. Anaerobic digestion improvements incorporated new submerged fixed concrete covers with improved mixing, withdrawal, gas management and heating systems, and a new sludge storage tank with dual membrane gas holding (Dystor) cover. A standby dewatering belt filter press was also added. Project funding was partially supported through federal ARRA stimulus funds, and State of Arizona SRF loans. To meet funding deadlines, design and construction was phased, with current construction estimated to be complete in January 2011.

9:00 - 9:30am

City of Phoenix 91st Ave WWTP Biosolids Master Plan

Ms. Angie Klein, PE, CH2M HILL

The City of Phoenix is conducting a 25-year facilities master plan update for the 91st Avenue WWTP, which currently produces approximately 600 wet tons per day of biosolids. The 91st Avenue WWTP has experienced several disruptions that may potentially affect the way the plant would handle biosolids in the future. The primary driver includes higher demand of land proximal to the WWTP and, thus, cost instability of land for biosolids application. To address these issues, as well as public perception and on-site capacity and treatment options, the City desires to further examine biosolids management options. The issues driving the need for biosolids assessment, the assessment methodology, and the biosolids management recommendations for the 91st Avenue WWTP will be addressed.

9:30 - 10:00am

Who Needs to Complete and Submit an Annual Report?

Mr. Daniel Czecholinski, Arizona Department of Environmental Quality

So, who is required to complete and submit an annual biosolids report? An overview on how to complete the annual report, what information is required and why ADEQ is requesting the information to be provided will be presented. The session will also identify what supporting documents must be submitted with the annual report.

10:00 - 10:30am

Typical Biosolid Inspection Deficiencies

Mr. Daniel Czecholinski, Arizona Department of Environmental Quality

This session will identify common deficiencies observed during an ADEQ inspection, with a special emphasis on the AZPDES permit specific requirements.

TRACK 1 - WATER TREATMENT PLANT DESIGN CONSIDERATIONS

1:30 - 2:00pm

City of Scottsdale CAP Water Treatment Plant Expansion Implementing Dissolved Air Flotation and Membrane Filtration

Mr. Brad Reisinger, Separation Processes, Inc.

The presentation will summarize the lessons learned and challenges faced during the design, equipment procurement, and construction of the City of Scottsdale's 20 MGD CAP Water Treatment Plant Expansion. Discussion will address unique aspects of pilot testing, procurement, design, and

construction of the new DAF and MF system using an alternative delivery method.

2:00 - 2:30pm

Design of a Ferrous Chloride Facility at the Val Vista Water Treatment Plant

Mr. Vance Lee, Carollo Engineers

During this presentation the background and design of a Ferrous Feed Facility at the City of Phoenix Val Vista WTP will be discussed. Specifically, the following items will be presented: brief background of the Stage 2 DBPR; the overall strategy being used by the City of Phoenix to control DBPs; theory of chlorine dioxide and ferrous chloride; Varying raw water quality at Val Vista WTP and its impact on the design; design criteria for the chemical feed systems and controls; and the 3-D model of the ferrous chloride facilities developed during design.

2:30 - 3:00pm

Changing Coagulants at Arizona's Largest WTP

Mr. Gordon D. Thelin, Carollo Engineers

Recently, the City of Phoenix decided to convert alum to ferric chloride as the primary coagulant chemical at their Val Vista Water Treatment Plant (WTP). This presentation will focus on the background leading to this replacement including an explanation of the testing and decisions that preceded it. In addition, hear about the challenges that were overcome to implement the changes necessary for the conversion as well as lessons learned from the process that can be used in future conversions. Finally, the presentation will cover data and analyses/results of ferric chloride performance at the WTP since the conversion.

3:30 - 4:00pm

Process Selection and Design for City of Glendale Zone 4 Groundwater Treatment Plant

Mr. Lee Odell, CH2M HILL

This presentation will cover the design criteria and process selection for the City of Glendale's Zone 4 Groundwater Treatment Plant. The presentation will cover process selection, waste minimization and operations strategies for the plant.

4:00 - 4:30pm

Operating Multiple Arsenic Treatment Facilities

Ms. Erin Pysell, City of Phoenix

Since the new arsenic standard has been in effect, eleven Arsenic Treatment Facilities (ATFs) and four Arsenic Blending Facilities (ABFs) have been designed, constructed and are providing drinking water. The ATFs remove arsenic by treating a portion or the entire flow by an adsorption process using granular iron media. Managing the efficient operations of numerous facilities requires setting up procedures, documenting and tracking the treatment process, conducting maintenance, and media replacement. In an effort to further maximize life and increase efficiencies the City is in the process of pilot testing two different types of adsorptive media. Preliminary results of the testing will also be presented.

4:30 - 5:00pm

Site Logistics - Overcoming Challenges In Upgrading Existing Plant Facilities

Mr. David Rieken Jr. P.E., McCarthy Building Companies

This presentation will focus on the tools used by McCarthy Building Companies and Wilson Engineers during the Pre-Construction and Construction phases to coordinate the existing facilities and temporary/new facilities. The Pre-Construction stage will focus on the extensive field investigations to locate and document the existing facilities and resulting design of the new plant structures/facilities. The Construction stage of the presentation will focus on how the team worked around the operating plant during the

excavation and backfill sequence to build a 20-30 foot-deep shoring system while excavating/stockpiling nearly 400,000 cubic yards of native soil, with a brief discussion on the process of how the native soil was mixed with cement to create a stable foundation for the new facilities.

TRACK 2 - DISTRIBUTION SYSTEMS

8:00 - 8:30am

The Real Value of a Distribution System Valve Program

Mr. Noe Avila, City of Phoenix

This presentation identifies the criteria necessary to identify the critical valves, their condition, and their effective operation and maintenance. Hear about the value of a good valve program, its impact on reducing the amount of water loss during emergencies as well as how to use them to locate deficiencies within the distribution system. Vital considerations for establishing a valve program will also be addressed.

8:30 - 9:00am

Planning Large Diameter Watertline Shutdown & Startup

Mr. Michael Ambroziak, Brown and Caldwell

As the water infrastructure throughout the country continues to age, the need for inspection of large diameter (>36-inch) water pipelines will become necessary to ensure that major asset will be around for future generations. Because many of the large diameter pipelines in most systems were not designed for access or inspection, the shutdown, dewatering, and startup of these pipelines typically requires extensive planning. The range of steps that must be taken in order to prepare a large diameter water pipe for inspection and recharge of that pipe for normal operational service will be discussed.

9:00 - 9:30am

Implementing and Maintaining Effective Distribution System Programs

Mr. Kenneth Morgan P.E., City of Phoenix

This presentation identifies a number of critical operation and maintenance programs for distribution systems as well as their value to being able to provide a cost-effective quality product to the customer. It provides value in using these processes in assisting water providers in their requirement to meet and/or exceed regulations, to develop and maintain efficiencies within their system, as well as to cost-effectively establish and manage a reliable infrastructure.

9:30 - 10:00am

City of Willcox Water System Improvements and Optimization

Mr. Thomas A. Martinez, P.E., WestLand Resources, Inc.

The City of Willcox undertook extensive water system improvements, with the added benefit of creating exceptional energy savings. WestLand worked closely with City staff and their Construction Manager at Risk to develop the required well and reservoir projects, making the system easier to operate, reducing wear on the existing distribution system, reducing power consumption associated with pumping, and providing adequate water quality and quantity. This was a model project in both public and private partnering, where a technical team worked closely to define a project that would solve both short and long term needs. The Willcox community will see the long-term benefits, as improved electrical efficiency is the gift that keeps on giving.

10:00 - 10:30am

Improving Water Quality through Reservoir Management

Mr. Tom Galezewski, HDR Engineering, Inc.

The City of Phoenix is pursuing multiple strategies to cost-

effectively ensure compliance with the Stage 2 Disinfectant Byproduct Rule by April 1, 2012. One of these strategies is to optimize the operation of the distribution system to minimize the formation of disinfection byproducts. Reservoir management is a key component of the distribution system optimization strategy. An evaluation of storage reservoirs was conducted to identify potential operational changes and capital improvements to control or limit trihalomethane formation. The results of this evaluation, including recommended improvements and associated costs, are presented.

TRACK 2 - DISTRIBUTION SYSTEM OPERATIONS

1:30 - 2:00pm

How Reliable are your Fire Hydrants?

Mr. James Sterne, City of Phoenix

This presentation establishes a process for implementing and maintaining effective fire hydrant O & M programs. A plan to determine the location and responses of critical fire hydrants, how they can be used to manage an effective water quality, along with being a useful component in providing a reliable response to any emergency will be addressed.

2:00 - 2:30pm

Implementing a Large-Scale Field Data Collection Program for Water System Hydraulic Modeling

Ms. Fair Yeager, CH2M HILL

The City of Phoenix has undertaken a comprehensive field data collection program to calibrate its water system hydraulic model. The City identified nearly 120 field data collection points throughout major pressure zones; field data to be captured included pressure via data loggers installed on fire hydrants and hydrant flow tests. Also, tests were scheduled for summer, fall, and winter to capture the range of high and low water demands. Completion of this field work required close coordination between the consulting engineer and City, support from the City's Water Distribution division, as well as notification and coordination with multiple departments/divisions (e.g. Customer Services, Fire, Compliance and Regulatory Affairs, Public Information, and SCADA).

2:30 - 3:00pm

Wickenburg's Water Distribution System

Ms. Misti Burkman, CDM

A comprehensive water distribution system master plan was prepared to identify necessary improvements to the Town of Wickenburg's water system to meet current and future customer needs through build out. The Town has experienced significant growth in residential sectors in different geographical areas and pressure zones. Development of the master plan was a dynamic process as ongoing planning of new developments for the area was occurring at the same time. This Water Master Plan update provided an up-to-date comprehensive look at the overall water system, using recent planning information as well as demand and system information developed from GIS-based data and customer billing system records provided by the Town.

TRACK 2 - BIOSOLIDS MANAGEMENT

3:30 - 4:00pm

The Story of New Digestion Facilities at the City of Avondale

Ms. Dana Trompke, Carollo Engineers

The City of Avondale recently completed its Phase I Expansion project, which expanded its current treatment plant and

added new primary clarification and solids handling facilities for the first time at this plant. The new solids treatment facilities consist of waste activated sludge (WAS) thickening facilities, two anaerobic digesters, a pumped mixing system, tube-in-tube heat exchangers, digester gas-fueled boilers, and an enclosed gas flare. Anaerobic digestion was selected as the means of stabilizing solids due to the addition of primary clarification and in order to meet Class B requirements for beneficial reuse of biosolids. "Seeding" and start-up of the biological process in the digester had to be closely monitored by daily sampling and testing of both sludge and gas.

4:00 - 4:30pm

A Simple and Efficient Approach to Managing Biosolids at Small Wastewater Treatment Plants (0-5 MGD)

Mr. Howard McCarthy, Tetra Tech

The Superstition Mountain Communities Facilities District No.1 (District) together with Tetra Tech developed a biosolids process that is "green", labor friendly and efficient. The solids are dried on polymer assisted filter beds, sent to windrow composting, resulting in a Class A, exceptional quality biosolid product. The District has been operating the system for over a year and the results show that it is producing dried solids at a higher capacity than expected. The District and TetraTech will discuss the process from inception through final completion. The District will discuss the operational procedures that they have found to be most effective. This presentation will provide small districts with a valuable approach to managing biosolids produced from the wastewater treatment plant process.

4:30 - 5:00pm

Dissolved Air Flotation Treatment of Residuals from a Membrane Water Treatment Facility in Yuma

Mr. Devin Shaffer, P.E., Carollo Engineers

The City of Yuma's Agua Viva Water Treatment Facility (WTF) employs dissolved air flotation (DAF) to treat residuals from the membrane water treatment process. This application of DAF is one of the first of its kind. Optimizing system performance involved significant bench-scale and full-scale testing. Different alum doses and coagulant aid polymer types and doses were tested. Hydraulic loading rates, internal recycle rates, and mixing energies in the DAF system were also adjusted to optimize performance. The DAF system was optimized using high mixing energies, an alum dose of approximately 10 mg/L to the WTF raw water stream, no additional alum feed to the residuals, and a PAC/polyamine polymer blend dosed to the residuals at approximately 30 mg/L.

TRACK 3 - WASTEWATER TREATMENT PROCESS

8:00 - 8:30am

Development and Application of a Model for the Design of IFAS Wastewater Treatment Plants

Mr. Rhodes R. Copithorn, GHD

Integrated Fixed Film Activated Sludge (IFAS) is gaining increasing acceptance as a reliable and cost-effective method to upgrade existing activated sludge plants for nutrient removal and to increase capacity. IFAS is the application of a fixed or free floating media in a conventional activated sludge system to increase biomass. This presentation will discuss the media systems available and their design, installation and operating requirements. The focus is on the application of a simulation tool for the design and operation of IFAS plants. Hear about general modeling concepts relative to biofilm modeling and to modeling hybrid system. You will also learn about the Aquifas model and illustrate its application through several case studies demonstrating calibration to actual plant operating data.

8:30 - 9:00am

UV Disinfection Systems – Achieving Non-Detect

Mr. Andrew Mally, Black & Veatch

The Mesa Northwest Water Reclamation Plant (NWWRP) UV Disinfection Upgrade included retrofitting existing ultraviolet (UV) disinfection channels with a Trojan 3000+, Low Pressure-High Output System, replacing the existing Trojan 4000, Medium Pressure system. The new system has a design capacity of 28.2 mgd and is expandable to 45 mgd in the future. Throughout the system's operation, the plant has consistently achieved non-detect disinfection results and has drastically reduced power cost associated with disinfection. You will receive detailed data on power consumption and effluent quality and lessons learned while retrofitting, starting up and commissioning the new system. The system's ability to achieve non-detect results regularly will be discussed in detail.

9:00 - 9:30am

Good to the Last Drop: Maximizing the Nitrogen Removal Capacity of the Ina Road Wastewater Reclamation Facility

Mr. Jim Doyle, Malcolm Pirnie Inc.

This presentation will provide a description of the background and steps involved in optimizing a biological nitrogen removal activated sludge wastewater treatment process at the Ina Road Wastewater Reclamation Facility (WRF) in Tucson, Arizona. It will describe the evaluations that formed the basis of the optimization and describe the collaboration between treatment operators and engineers to develop and execute a plan that demonstrated that the system is capable of treating 40 percent more flow than its rated capacity. The optimization study was used to form the basis of an application to ADEQ to re-rate the facility and provide additional capacity to be used to provide operational flexibility during constructed improvements to the Ina Road WRF and Roger Road WRF.

9:30 - 10:00am

Avondale WRF Flow Equalization - Performance vs. Expectations

Mr. Joshua Brown, DSWA

The Avondale Water Reclamation Plant was expanded recently, integrating flow equalization into the process. By May 2010, the facility will have nearly six months of operation. This presentation compares the actual operational experience against the process expectations and anticipated challenges. The principle advantage of flow equalization is an increase in the plant's total capacity that minimizes the size and cost of the downstream treatment units. The second is improved plant operations by stabilizing flows to downstream processes. Anticipated operational challenges include avoiding basin overfilling and premature emptying, avoiding sedimentation and septic conditions within the basin, and fine tuning controls to maintain constant flow to downstream processes.

10:00 - 10:30am

Turbo Blower Technology at the City of El Mirage

Mr. David Emon, The City of El Mirage

In May 2009 the City of El Mirage suffered a fire that burned up two existing rotary lobe aeration blowers. Instead of replacing the blowers with similar units, the City of El Mirage seized the opportunity to explore newer technology and replaced the rotary lobe blowers with turbo blowers. These unique blowers are well suited for the SBR application with built in flexibility and pressures to accommodate the varying liquid levels. The presentation will cover the work needed to recover from the fire short term and long term, issues with blower selection, the installation and integration of the blowers into the existing mechanical and electrical system, and the electrical savings and other benefits realized.

TRACK 3 - MEMBRANE TREATMENT

1:30 - 2:00pm

Microfiltration System Upgrade at the Water Campus Advanced Water Treatment System

Mr. Robert Boysen, Separation Processes Inc

The City of Scottsdale is expanding the Water Campus Advanced Water Treatment System, which achieves indirect potable reuse through vadose zone injection. As part of the expansion, the City is replacing their membrane filtration equipment. The project has employed a unique procurement and construction approach where separate detailed designs have been prepared and bid for each MF system. During the project, the new MF equipment will be installed within the existing microfiltration building. This approach saved the cost of new building space but also places additional constraints on the construction work. This presentation will highlight key differences between the two designs and details of the design and construction efforts.

2:00 - 2:30pm

Ceramic Membrane Technology Update

Mr. Scot Thompson, Black & Veatch

A summary of the ceramic membrane technology, a comparison to polymeric membranes, and an update on configurations and cost information will be presented. Recent advances in configuration have brought the initial cost down compared to polymeric membranes. Compared to polymeric membranes, ceramic membranes offer increased chemical resistance, rigid structure for increased mechanical strength, and increased lifespan, but at higher initial cost.

2:30 - 3:00pm

Comparing Polymeric and Ceramic Membranes - Can Ceramics Really Compete?

Mr. Richard Stratton, HDR Engineering, Inc.

The City of Watsonville is designing a new 2.5 mgd membrane drinking water filtration plant to treat a flashly surface water. Polymeric and ceramic membrane suppliers were invited to propose on a competitive procurement that was based on total life cycle costs. The results of the competition and the proposed plant design are presented. Pilot testing results for the membranes are also presented.

3:30 - 4:00pm

Ultrafiltration Systems for Potable Water System Improvements at CAP Pumping Plants

Mr. Wontae Lee, HDR Engineering Inc.

This presentation will discuss the advantages and disadvantages of the three ultrafiltration systems, and the process selection procedures for the potable water system improvement at remote pumping plants.

4:00 - 4:30pm

Gila River Indian Community - Innovative Operations Approach to New RO Water Treatment Plant

Mr. James Yallaly P.E., CDM

Major changes in operational requirements have occurred at the Gila River Indian Community Wild Horse Pass Potable Water System. Treatment operations have transitioned from water wells with chlorination to a new high tech reverse osmosis water treatment plant. To meet this challenge, the Gila River Indian Community took an aggressive approach to involve the operating personnel, technical and administrative staff in the construction, prestart-up and start-up phases. With this intensive preparation, the five million gallon per day new plant went on line in July, 2009, and has remained in full operation without interruption, producing high quality drinking water for the community and the associated recreational facilities.

4:30 - 5:00pm

Powdered Carbon Silo Design

Mr. Rudolf N. Ouwens, Wilson Engineers

The City of Phoenix wishes to upgrade its Deer Valley WTP carbon feed system from a bunker slurry style to a dry powdered silo. The powdered carbon silo presentation will examine existing carbon feed systems and review maintenance items encountered. Then, it will summarize the design process in an attempt to reduce the maintenance involved. Silo location will be assessed and feed line sizing & routing will be examined, in order to reduce plugging. Underground conflicts are examined along with the steps taken to avoid them. The site has poor soil conditions and methods were used to prevent settling.

TRACK 4 - PRETREATMENT

8:00 - 8:30am

The Local Pretreatment Ordinance

Ms. Lynn Lychtenberger, City of Avondale

This presentation will provide an overview of the basic elements of a Pretreatment Ordinance. What is the significance of a local ordinance? How specific does it need to be and how general can it be?

8:30 - 10:00am

An Overview of Local Limits Development

Ms. Patti Trahem, Independent Consultant

Why do I have to spend the time and resources to develop Local Limits? Can't I just use BigCity's? EPA has approved their limits so why not just adopt the BigCity limits and be done with it? For that matter, EPA has all of these Categorical Standards - aren't they enough? This session will provide brief discussion about the information you need to collect; considerations about sampling and analysis; effects of the industrial and commercial makeup of your system; and the various methods to distribute the pollutant load to your customers.

10:00 - 10:30am

The Occurrence of Naegleria fowleri in Surface Waters in Arizona

Ms. Laura Sifuentes, University of Arizona

Naegleria fowleri is a water-based parasite that causes primary amebic meningoencephalitis (PAM) in young children and older or immunocompromised individuals with a 99% fatality rate. PAM is contracted during water-based recreational activities when water is forcefully inhaled through the nasal cavity. The amoeba penetrates the nasopharyngeal mucosa and migrates to the olfactory nerves, eventually invading the brain. Death typically follows within 4-7 days. Between 1995 and 2004, N. fowleri killed 23 people in the United States. Our current research focuses on determining the prevalence of N. fowleri and other amoebae in Arizona surface waters and determining the association between the occurrences of these organisms and seasonality. For the first round of samples in the summer months, 5% of the samples were positive for N. fowleri.

TRACK 4 - WATER RESOURCES

1:30 - 2:00pm

Sustainability in Water Environment: Industrial Wastewater Treatment for Recycle to Food Processing

Mr. Robert Clinger, CDM

As a part of the sustainability effort in its food processing plants, Frito-Lay (FL) selected its production plant in Casa Grande, Arizona to be the first "Net Zero" facility. Within the project, a new Process Water Recovery & Reuse treatment plant (PWR&R) that treats the industrial process wastewater

for recycle and reuse of over 75% of the total process water generated was planned and implemented. Sanitary wastewater is separated and discharged to the City sewer. These facilities were designed and constructed using the alternative delivery method of design build. Construction of the facilities was completed in 2009 and operation has started. The details of the process design steps and the results as it relates to the design will be discussed.

2:00 - 2:30pm

Onsite Water Recycling as a Cost Competitive Solution

Ms. Teresa Valentine, PE, PHD, Valentine Environmental Engineers

As the "Green" philosophy continues to expand, there is an ever increasing demand for more a more environmentally conscious approach to design. Simultaneously, as we continue through difficult economic conditions, there is also a drive for cost conscious engineering. The Corrections Corporation of America has fully embraced both philosophies as they tasked Valentine Environmental Engineers to provide Green engineering analysis of their proposed San Diego Replacement Facility.

2:30 - 3:00pm

Emerging Contaminant – Nanoparticles: Stability in Water and Removal by Water Treatment Processes

Dr. Yang Zhang, Wilson Engineers

Nanoparticles are receiving a lot of attention on their environmental implication. Our search provides a context for understanding the behavior and fate of nanoparticles in natural water and the capability of current water treatment technology to remove nanoparticles from the water. A typical concentration of 4 mg/L NOM in surface water can stabilize most nanoparticles. However, Ca²⁺ counteracts the stabilizing tendency of NOM. 4-6 mM Ca²⁺ causes aggregation of those nanoparticles stabilized by NOM. Conventional water treatment processes remove only 40% to 80% nanoparticles from the water. The presence of NOM requires extra-high alum dose (150 mg/L) for 80% nanoparticle removal. Comparatively, 0.45 um membrane filtration can improve removal efficiencies of nanoparticles.

TRACK 4 - YOUNG PROFESSIONALS

3:30 - 5:00pm

Recession-Proof Yourself and Your Career

Ms. Manika Gupta, CH2M HILL; Ms. Nancy Reynolds, Lee Hecht Harrison and David Feiler, North Star Financial

This session will address how to protect yourself as a young professional during times of uncertainty, both with your career and your personal finances. We will cover how to market yourself as a leader and build a support network in your current position. If you are looking for a new career, we will also discuss the latest trends in the job market and how to market yourself to other companies. In terms of personal finances, you will learn the best way to position yourself for future economic recovery. This session will also feature an open forum Q&A panel, where additional career and financial development questions can be addressed.

TRACK 5 - FACILITY OPERATIONS

8:00 - 8:30am

Arizona Water / Wastewater Agency Response Network (AzWARN)

Mr. Steve Shepard, AZWARN

This presentation will provide attendees information on the Arizona Water/Wastewater Agency Response Network (AzWARN) and its benefits to water and wastewater utilities in responding to emergencies. When a water or wastewater utility faces an emergency, the universal goal is to keep customers in service. AzWARN provides access to resources

to meet that goal. The presentation will also review the milestones achieved by AzWARN and future challenges.

8:30 - 9:00am

Engineers and Scientists Working Together: Disaster or a Better Process for Wastewater Treatment Plant Design and Permitting?

Ms. Rebecca Sydnor, EIT, LEED-AP, Engineering and Environmental Consultants Inc

Wastewater treatment plant design is generally conducted separately from wastewater treatment plant permitting. These two activities are often performed by different people, from different disciplines (sometimes at different companies), and at different times. However, when the engineers and scientists work together from the onset, the design and permitting processes both benefit - and the client as well. This presentation discusses a real-life example of such a synergy, including design processes that can be improved by an understanding of the permit requirements and the permitting processes that can be improved by an understanding of design requirements. Design and permitting, engineers and scientists working together ensure a better final product and a more streamlined process.

9:00 - 9:30am

The Case for O&M Optimization During Design

Mr. Kerry Brough, OEM Services

This session will emphasize the need for more O&M consideration in water and wastewater facilities design. O&M optimization has the goal of making the most efficient use of available human and facility resources. Local case studies and examples are provided to identify how design impacts efficient operations and long term O&M costs. Strategies and practices for O&M optimization are presented along with design considerations that can support optimization. Specific recommendations are provided on how facility stakeholders, not just design engineers, can work together to overcome the obstacles and constraints to O&M optimization.

9:30 - 10:00am

Carbon Fiber - Not Just for Golf Clubs Anymore

Ms. Carrie Cote, EEC Inc

EEC and HJ3 worked together on a wastewater infrastructure rehabilitation project using the HJ3 Carbon Composite Lining System to meet Best Available Demonstrated Control Technology requirements with the ultimate goal of classifying the structure as a non-discharging facility. Using the HJ3 Carbon Composite Lining System not only provides near impermeability of wastewater infrastructure in extreme temperature and chemical conditions and is formable to the structures' irregular surface, the added benefit of enhanced structural integrity enhances and extends the useful life of any structure.

10:00 - 10:30am

Corrosion Control & Cathodic Protection for Water & Wastewater Systems

Mr. Jack Ripley, Corpro

Corrosion is a process that attacks buried or submerged metallic structures often resulting in water and wastewater service disruptions along with increased maintenance and operating costs. The goal of this presentation is to identify and explain in an easily understood manner the corrosion process and its impact on cast and ductile iron steel and pre-stressed concrete cylinder pipe water storage tanks and lift stations. Topics to be reviewed and discussed will include stray electrical currents aggressive soils bimetallic coupling coatings and cathodic protection.

TRACK 5 - WASTEWATER OPERATIONS

1:30 - 2:00pm

Treatment Plant Optimization Leads to Additional Savings

Mr. Andrew Baumgardner, Black & Veatch

Learn how one municipality's focus on low-cost and easily implemented operational changes can result in savings. The presentation includes the study methodology, the study findings while presenting sensitivity of the evaluation to power and chemical cost variations. Many of the savings ideas could apply to similar municipal treatment facility operations, such as evaluating alternative chemicals, storage volumes, flow-pacing and off-peak operations.

2:00 - 2:30pm

Effects of Increased Wastewater Strength in Northern Arizona

Mr. Carlos Lopez, Carollo Engineers

Wastewater characteristics drive the performance of wastewater treatment processes. Several factors influence wastewater characteristics, such as increased use of water efficiency fixtures, lifestyle changes in the community, and increased commercial and industrial contributions, among others. The City of Prescott has experienced a significant increase in wastewater strength compared to the original design criteria at its two main wastewater treatment and reclamation facilities. The existing average wastewater concentrations at the Sundog WWTP and the Airport WRF have increased by factors between 2.5 to 3.2 for biochemical oxygen demand (BOD) and total suspended solids (TSS). This presentation will discuss factors contributing to the increase in wastewater concentrations, and the effect of the increased wastewater strength in the treatment process performance.

2:30 - 3:00pm

The Commissioning of a Large Pump Station - Lessons Learned

Mr. Chad Meyer, Carollo Engineers

The 91st Avenue Wastewater Treatment Plant (WWTP) Unified Plant 2005 (UP05) Expansion included the design and construction of a portion of the Unified Pump Station (UPS) that will deliver treated secondary effluent from the treatment facilities to both the Tres Rios Constructed Wetlands and the Arizona Nuclear Power Plant. Each half of the UPS will contain three 110 mgd, and two 40 mgd vertical mixed axial flow pumps, providing an eventual firm pumping capacity of 600 mgd. This presentation will review the design and construction phases of the UPS portion of the UP05 project, and will discuss a number of lessons learned during the commissioning phase of the new facility.

3:30 - 4:00pm

A Case for Lower Return Sludge Flow Rates

Mr. Ronald Schuyler, Tetra Tech EAS-IMR

Poor settleability of activated sludge is the most common cause of clarifier failure. High return sludge flow rates (RSF) are a principle cause of poor sludge settleability and other clarifier problems. It is theorized that floc-forming microorganisms proliferate under feast/famine conditions where they feed heavily at the inlet to the bioreactor and then deplete all stored food as they travel through the remainder of the bioreactor. High RSF reduces both the degree of feasting and the amount of time per pass for the microorganisms to accomplish complete famine. The result is greater potential for filament growth. This presentation will provide the results of operating a number of plants at lower RSF to help maintain good sludge settleability.

4:00 - 4:30pm

MBR - Maintenance for Operators 2 Know: "Our First Year of School"

Mr. Roger Carr, City of Peoria

The differences between a conventional wastewater treatment plant and a Membrane wastewater plant will be reviewed. Zenon, Sundt, and the City of Peoria's staff commissioned the plant in late June, 2008. One of the operational constraints to overcome was the lack of familiarity with the membranes, a new type of technology for Peoria operators. Another challenge was maintaining this entirely different process and equipment. There were, however, "opportunities" for improvement to be discovered and implemented by a creative start-up team. Statistics show a rapid growth of membrane facilities throughout the world. Membranes usage is widespread and they have historically performed very admirably. The use of membranes will continue for years to come. Who knows, MBRs may be your future!

4:30 - 5:00pm

Designing, Building, and Operating and 10 MGD Membrane Plant - Year One

Mr. Raymond F. Trahan, City of Peoria

In the early 1990's, the City of Peoria was faced with projections of rapid annual growth well into the next decade. Since 1978, the city had contracted with the City of Tolleson to treat the wastewater from the southern (most populous) half of the city and received no benefit from the effluent. This presentation recounts the effort to design, build, and operate a treatment plant that would enable the city to site a plant in the most developed area of the city, provide beneficial effluent recharge or reuse, design with a small footprint and room for expansion, and meet tight effluent standards. Citizen involvement, construction-management at risk procurement, start-up, and costs will be addressed.

TRACK 6 - SAFETY

8:00 - 9:00am

Ergonomics

Ms. Karen Lunda, Lunda & Associates, P.C.

While California remains the only state to have ergonomics regulations OSHA will still cite employers under the general duty clause if an employee is injured and it is related to a condition directly related to the workplace. Proposed regulation defines "ergonomic hazards" as conditions where intervention may be necessary to prevent a musculoskeletal disorder. Such conditions can be identified by an assessment of ergonomic occupational risk factors and reports of signs and symptoms. "Ergonomic occupational risk factors" means characteristics of a work situation that may contribute to a musculoskeletal disorder. These risk factors may be characteristics of the workplace, tasks or individual work practices; see how these risk factors may be addressed in the water industry.

9:00 - 10:00am

Defensive Driving

Ms. Maria Wojtczak, Driving MBA

Motor vehicle accidents remain the number one cause of workplace fatalities. Many of the issues facing our employees is that poor driving habits permeate the performance of vehicle operators and many times it is the poor habits of the "other driver" that create unsafe situations that drivers must react to. Recently many organizations have made moves to implement "Distracted Driver" programs to address some of the more common causes of vehicle accidents. In this session we will address some of these issues and ways that organizations can work to improve driver safety through training programs and driver evaluations.

1:30 - 3:00pm

Lone Worker Safety

Mr. Wayne Ziemann, Workplace Safety Specialists

Working alone can create extra health and safety risks. If you employ lone workers, you'll need to manage these risks. Many employees travel for work, work at night or are stand-by personnel, lone workers. The hazards for these workers are the same as those at large facilities with multiple employees on site, but the risk factors are magnified due to the absence of assistance in the event of an emergency. This session will outline some solutions to managing this risk with equipment, procedures or policy.

3:30 - 5:00pm

Accident Reporting/Incident Root Cause Analysis

Mr. Fred Kriess, Severn Trent Services

Effective accident reporting and incident root cause analysis programs are used to ensure that appropriate levels of an organization are actively involved in the process of determining ALL corrective actions; and then ensuring they have been implemented to prevent future occurrences. Employees, supervisors and management all have roles in which they should be active in the process. Too often only "direct" causes are identified and "indirect" causes are ignored as minor and "management systems" are completely ignored as an organization may not have active involvement of management in the safety program. This session will address some tools and techniques that can be used during the incident investigation process and provide some guidance on finding the true root cause of incidents.

FRIDAY, MAY 7

TRACK 1 - ENERGY CONSERVATION, RENEWABLE ENERGIES AND CARBON FOOTPRINT

This session will start with an overview of carbon regulatory trends and renewable energy opportunities with a potential for reducing the carbon footprint in water and wastewater facilities. The session will then discuss the potential beneficial use of fats, oil and grease (FOG) for the production of biofuel, while reducing the costs associated with maintenance of collection systems affected by the accumulation of FOG. Next, an update on the research conducted at Arizona State University on photobioenergy (energy produced by solar powered photosynthetic microbial engines to convert carbon to biomass) will be presented. Finally, an overview will be provided of finance mechanisms to incentivize clean technologies such as energy efficiency, renewable energy and carbon footprint reduction.

8:00 - 8:30am

Carbon Regulatory Trends and Renewable Energy Opportunities

Mr. Fernando Sarmiento, Greeley and Hansen

In the last few years we have been experiencing how the attention to GHG emissions (carbon footprint) has been rapidly growing in different sectors including water and wastewater. Also, there is more and more talking about energy-efficient facilities and the potential development of a cap-and-trade system for GHG emissions. This talk will provide an overview of carbon footprint regulatory trends and current leading protocols to estimate GHG emissions from wastewater treatment. Also, an overview of renewable energy opportunities (solar, digester gas, wind, geothermal, biomass and hydropower) with potential for carbon footprint reduction will be provided.

8:30 - 9:00am

The Economics of FOG

Ms. Jessica Luk, School of Business at University of Pennsylvania & Mr. Nate Turner, BlackGold Biofuels

Led by a team of students from The Wharton School of Business at University of Pennsylvania, in partnership with BlackGold Biofuels, Inc., Economics of Fats, Oils, Greases (FOG) strives to better understand how FOG is currently handled in U.S. municipalities. There is strong interest, and, in some cases action already, from municipalities to (i) start FOG collection programs that reduce and prevent FOG from entering the collection system, and (ii) invest in technology that converts grease to biodiesel. One successful grease collection and biodiesel program reduced the municipality's sewer system overflows by 40% and generated \$8-12k savings in fuel costs per year, respectively.

9:00 - 9:30am

Photobioenergy Platforms: Solar-Powered, Carbon-Neutral, and Sustainable Technologies for Tomorrow

Mr. Raveender Vannela & Mr. Bruce Rittmann, Biodesign Institute at Arizona State University

Global warming is a challenge that can be slowed, and perhaps reversed, with a social will to replace fossil fuels with renewable, carbon-neutral energy platforms. A long-term option upon us is the photobioenergy, energy produced by solar powered photosynthetic microbial engines to convert carbon to biomass. These photosynthetic organisms offer advantages over other forms of bioenergy, with a difference of two orders of magnitude in terms of yields of lipids per hectare over oil-rich plants and high lipid content for making convenient transportation fuels. Research at Arizona State University combines the metabolic engineering of the photosynthetic microbes with large-scale photobioreactor engineering. Different configurations of photobioreactors and issues pertaining to scalability, survivability, and sustainability for large-scale operations are discussed.

9:30 - 10:00am

LCA and Emerging Finance Mechanisms for Energy, Water and GHG Reduction

Ms. Juliet Johnson, Juliet S. Johnson Consulting

Assessment boundaries and full characterization of project impacts using life cycle assessment (LCA) can help water managers avoid "greenwashing" and support decisions that minimize total environmental impacts. LCA is a standardized process for evaluating environmental impacts of the full life cycle of a project. LCA accounts for energy, water and pollution not only from the operation of a project, but also materials extraction, manufacturing, transport, maintenance, emissions/waste and final disposal. Finance mechanisms are being proposed to incentivize clean technologies such as energy efficiency, renewable energy and GHG reduction. This talk summarizes how systems thinking and LCA can be used to inform decision-makers about total costs and environmental impacts and facilitate inclusion within emerging finance mechanisms for energy and GHG reductions.

TRACK 1 - ENERGY/CARBON FOOTPRINT

10:30 - 11:00am

Wastewater Treatment Plant Waste-To-Energy Case Studies

Mr. Greg Chung, Kennedy/Jenks Consultants

Three full-scale waste-to-energy recovery facilities at wastewater treatment plants will be presented. Information that will be covered in the presentation includes planning for the facilities, facility design, facility construction, and operational experience. General benefits to the communities include tipping fee revenues, stabilization of anaerobic

digester process, higher gas production, and lower solids hauling costs.

11:00 - 11:30am

Assessment of Electrical and Thermal Energy Needs, Requirements and Supply Options for the Ina Road Wastewater Reclamation Facility

Mr. Ron Williams, CH2M HILL

The expansion plan for the Ina Road WRF includes the continued use of methane gas to produce on-site power through a new Energy Recovery Facility. However, additional power will be required to meet the projected energy demands. Two primary alternatives are available for supplying the additional power to meet the projected loads. Alternative No. 1 considers TEP increasing their current supply to provide the balance of the power for meeting all of the electrical energy demands. Alternative No. 2 includes generating additional power on-site utilizing natural gas to meet all of the electrical energy demands. Each alternative provides a different thermal energy balance.

11:30 - 12:00pm

Energy Savings and Cost Reduction - Practical Applications for Engineers and Operators

Mr. Mark F. Taylor, P.E., WestLand Resources, Inc.

A great deal of energy is required for the delivery of potable water and for the treatment of wastewater. The focus on energy conservation, and recent economic challenges, makes it more important than ever for utilities to consider areas where modifications to operation, maintenance, and system design can save energy and expenses. This presentation will focus on energy usage and practical applications to reduce energy consumption, looking at both system level (flow, pressure and pumping time) and component level (specific equipment). Achieving a basic understanding of these considerations will allow water system personnel and engineers to focus on opportunities for energy savings, and start down the path toward the most cost-effective and appropriate changes for their water system.

TRACK 1 - UTILITY MANAGEMENT

1:30 - 2:00pm

Where's the Manual? An Internet Based Solution

Ms. Melissa C. Henderson, P.E., Lockwood, Andrews, & Newnam, Inc.

Many times documentation is lost, not provided, or not passed on between generations of plant operators regarding the design intent of the facility and how to optimize use of the equipment on hand. A simple approach to improve the operations of system-wide pump stations through the development of a web-based format will be explained. It allows the Operations Plan to be dispersed to the varied group of users, compiles all pertinent information in a single location, eliminates or reduces the need for paper, and also allows easy updating of the plant information. The diverse audience for the Operations Plan includes the control operators, field pump station personnel, and the engineers and managers responsible for the pump stations.

2:00 - 2:30pm

An Alternative Approach to Evaluating the Productivity of Field Crews

Ms. Mary Beckner, City of Phoenix

This presentation establishes a process of determining reasonable expectancies for the various distribution system functions, evaluates the productivity of the crews performing the work and aids in planning a path for the improvement and/or enhancement of water personnel.

2:30 - 3:00pm

Protecting Your Water Supply and Your Bottom-Line: Shifting Treatment Costs From Ratepayers to Polluters

Mr. Victor Sher, Sher Leff LLP

Landmark lawsuits brought by cities and other public water agencies against manufacturers of chemicals that have contaminated public drinking water supplies will be addressed. These lawsuits have important implications for public water suppliers' lawyers, regulators, and environmental consultants. Hear about the legal theories underlying these landmark cases and the status of lawsuits currently pending in jurisdictions around the country. Also discussed will be emerging contaminants of concern to rural water providers and the legal and political responsibilities and pitfalls involved in addressing actual or threatened contamination of a public water supply.

TRACK 2 - WATER FOR PEOPLE

8:00 - 8:30am

An Introduction to Water For People

Mr. David Christiana, Arizona Department of Water Resources

Water For People is an international nonprofit development organization that is committed to improving access to safe drinking water and adequate sanitation in developing countries. Water For People's strategic plan highlights four areas for focus: strategic growth, international programs delivery, resource development and organizational excellence. Launched in 2006, Water For People's World Water Corps program provides professional support to Water For People's work overseas within the parameters of its community-based model. Locally, the AZ Water Association Water For People committee supports the national organization's mission through community outreach, advocacy, and fundraising.

8:30 - 9:00am

Appropriate Treatment Technologies for Use in Developing Areas

Mr. Levi Dillon, Carollo Engineers

When implementing treatment technologies in developing areas it is important to utilize designs with special consideration to the environmental, ethical, cultural, social and economic aspects of the community it is intended for. Appropriate technology is generally that which uses the simplest level of technology that can effectively achieve the intended purpose in a particular location. Such technologies require fewer resources and simpler maintenance compared to industrialized practices and are typically labor-intensive solutions versus capital-intensive ones. Examples of appropriate technologies for use in developing areas include ceramic filters and storage tank chlorination for water systems and san-plats and pit latrines for sanitation.

9:00 - 10:00am

Film: The American Southwest: Are We Running Dry?

The Chronicles Group

Nearly every state in the American Southwest is affected by a water crisis and is struggling with record dry conditions. From the White House to the House of Representatives, director, writer and producer Jim Thebaut interviews key thought leaders for an intelligent and informed discussion about the evolving water crisis. Thebaut filmed at diverse locations including the Navajo and Hopi reservations, on Capitol Hill and in Las Vegas for an absorbing and contemplative discussion about conservation, water reuse, desalination, unprecedented population growth and future water policies.

TRACK 2 - REUSE/RECHARGE

10:30 - 11:00am

Point of Compliance Monitor Well Nitrates, A New Paradigm

Jamie McCullough, City of El Mirage

City of El Mirage Point of Compliance Monitor Well exceeded the Aquifer Quality Limit of 10 mg/L. The history of the area, land use, development, past wastewater discharge, soil morphology, hydrology and nitrate characteristics were reviewed in order to understand what could cause the high nitrate in the monitor well when the effluent quality was excellent. Through this investigation and utilizing valuable information found in the July 2009 article in the Kachina News, "Groundwater Recharge and Its Impacts on Non-point Source Nitrate Contamination," we developed a workable solution to avoid future violations.

11:00 - 11:30am

The Planning and Implementation of a Municipal Non-potable Water System

Mr. Alan Palmquist, Wilson Engineers

The City of Peoria encompasses the Vistancia Community, which is located in the northwest portion of the City. The Vistancia Community recently completed the installation of a new 1.5 MG Reservoir and Booster Station Facility to the existing non-potable water system. This project is another piece into an overall non-potable water system strategy for the community. This presentation will focus on the planning of the non-potable water system, its operation with the recent installation of the 1.5 MGD Reservoir and Booster Station, and future expansion as the community continues to grow.

11:30 - 12:00pm

So You Have You APP - What Now?

Mr. Keith Scouler, Archaeological Consulting Services Ltd.

Following up last year's presentation of "ABCs of APP," this presentation describes achieving and maintaining compliance with your APP. There is more to compliance than submitting SMRFs. There are permit requirements in the body of the permit and in the Compliance Schedule. Maintaining a positive compliance history and good relations with ADEQ will make subsequent permit amendments easier. When considering permit amendment, remember that when a permit is amended it also becomes subject to revision by ADEQ. Determining the type of amendment is also important since some amendments require more time and money than others. A significant amendment requires a new public review period. Understanding the different requirements of minor, significant, and "other" amendments can save you time and money.

TRACK 2 - RO/SALINITY/REUSE

1:30 - 2:00pm

It's the Salt: Evaluation of Alternatives to Mitigate Intermittent Reclaimed Water Toxicity at the Cave Creek WRP

Mr. Doug Kobrick, P.E., CDM

Salinity is a significant issue for Arizona water/wastewater utilities including at the Cave Creek WRP, where reclaimed water has been found to have intermittent chronic toxicity, and follow-up studies linked to salinity and chlorides. Alternatives evaluated included: diurnal flow management to avoid late-night hours when some water softeners regenerate; pretreatment requirements for significant commercial dischargers; an expanded aquifer recharge program (with reduced salinity reclaimed water); reclaimed water desalination; drinking water supply softening; and customer education/regulation to discourage home water softeners. The evaluation results will be instructive as other reclamation facilities are likely to face future similar issues.

2:00 - 2:30pm

Results of Pilot Study of Reverse Osmosis for Salinity and Trihalomethane Removal in Reclaimed Water, Fountain Hills Sanitary District

Mr. Willie Farmer, P.E., CDM

Results of a pilot study in Fountain Hills to determine the effectiveness of reverse osmosis in removing salinity and trihalomethanes from reclaimed water, water quality issues of concern for many Arizona reclamation plant will be presented. The study found that TDS removal was achieved; salt rejection rates were greater than 90%. Water recovery rates approaching 90% also were demonstrated. THM removal varied, and appeared to deteriorate over the course of the study; this may be due in part to changes in the composition of THMs in the RW due to variations in the drinking water sources. Calcium phosphate emerged as a constituent of concern. It became necessary to reduce the pH to around 6.3 to keep it in solution.

2:30 - 3:00pm

Expansion of Scottsdale Water Campus Reverse Osmosis System Using Large Diameter Technology

Mr. Robert McCandless, Separation Processes Inc

This presentation will cover the current expansion of the reverse osmosis system at the City of Scottsdale Water Campus. The expansion is being completed using large diameter reverse osmosis membranes to minimize building footprint and cost. Hear about the benefits and challenges of a large diameter reverse osmosis system over conventional reverse osmosis systems.

3:00 - 3:30pm

Post RO Conditioning Using Limestone Bed Contactors for Copper Corrosion Control

Mr. Jared Carr, Water Works Engineers

The City of Phoenix SR-85 Public Water System treats groundwater for its potable water service. A reverse osmosis system was installed to reduce concentrations of cadmium, fluoride, nitrate, uranium and TDS. This caused unintended consequence of exceeding copper action level within the distribution system. Several corrosion control techniques were considered to stabilize RO permeate before distribution. Limestone bed contactors were explored as a method of increasing dissolved inorganic carbon (DIC) and pH. Bench testing showed that pH and DIC can be sufficiently increased using calcium carbonate under relatively short contact times. Low capital and maintenance costs and simple operations make limestone bed contactors an attractive treatment method for this system. This presentation will benefit other systems considering RO system installations.

TRACK 3 - WASTEWATER COLLECTION

8:00 - 8:30am

How Many Funding Agencies Does It Take To Make A Project?

Ms. Maria Brady, Stantec Consulting Inc.

For the Yuma B&C Colonia Sewer Collection System, it took five: BECC, NAD Bank, EPA, WIFA, and Rural Development. These agencies contributed a total of \$23 million in grants and loans to a Yuma County Improvement District to provide a sewer collection system for 6,000 residents in an older neighborhood. Yuma County was the lead organizer and the City of Yuma will provide maintenance and treatment. Nine miles of collection system and 600 connections will be made. Construction is complicated by narrow streets, service connections on private property, and mains up to 18 feet deep in high groundwater conditions. Coordination is the foundation of this project and represents over ten years of effort to plan, fund, design and now construct.

8:30 - 9:30am

Tracking Down the Roots of our Sanitary Sewers

Mr. Jon C. Schladoweiler P.E., WestLand Resources, Inc.

The evolutionary development of sewers can be likened to the "bio-rhythms of life"; it has indeed had its ups and downs over the past 10,000 years. This presentation will trace the development of sewers from 3500 BC on through to the early 1900's. Through Tracing Down The Roots Of Our Sanitary Sewers, you'll be walked through time, and the need for ... and the evolutionary growth of sewers; with the aid of animation, photos, sketches and anecdotes. You'll come away with a better appreciation for the "roots" of our modern day sewage conveyance systems and, the "ups and downs" they have traversed through the ages.

9:30 - 10:00am

Condition Assessment of PVC "T-Lock" Lined Concrete Sanitary Sewers for Rehabilitation

Mr. Joe Graham P.E., Dibble Engineering

The City of Phoenix has initiated a condition assessment of large diameter PVC T-Lock lined pipe within their sanitary sewer collection system. Various standards and techniques have been employed in the past for joining the PVC lining of adjacent pipe segments. A 36-inch diameter pipe installed in 1986 is showcased as an example of the performance of the PVC lining and pipe joint integrity after 25 to 30 years of active service. Dibble Engineering utilized a digital Panorama 360 CCTV camera and Pipelogix - Flexidata software to visually assess the condition of the pipe interior. This presentation highlights the tools and techniques utilized during the condition assessment, and presents the performance of PVC T-Lock protective lining and typical defects encountered.

TRACK 3 - RESEARCH

The AZ Water Research Committee will sponsor six 30-minute sequential presentations relevant to current research on water and wastewater issues nationally and in Arizona. Speakers include experts from ADEQ, Arizona State University, and the University of Arizona. Topics will include sustainability, integrated modeling, salinity issues, water quality, contaminants of emerging concern, the water-energy nexus in Arizona, and other current water research topics funded at the State's universities. The session will also include the 2010 winning Quentin Mees paper, commemorating the late professor and department head of civil engineering at the University of Arizona.

10:30 - 11:00am

Quentin Mees Award Winning Research Paper

Speaker and Topic TBA

11:00 - 11:30am

Alluvial Filtration to Control DOC and DBP formation - Centralized vs. Decentralized

Dr. Peter Fox, Arizona State University

Groundwater recharge has the potential to remove DOC and minimize DBP formation. Large centralized recharge basins have been developed for storage and have limited potential for treatment. A decentralized approach to recharge such as the systems that have been developed in Southern California offers greater potential for a sustainable system.

11:30 - 12:00pm

Desalination of Central Arizona Project Water in Tucson - Cost comparison of methods for Minimizing Brine Losses

Dr. Robert Arnold, University of Arizona

Inland desalination inevitably leads to brine disposal costs that are not shared by coastal municipalities. Brine disposal costs were compared for treatment options consisting of (i)

reverse osmosis alone, (ii) RO followed by vibratory shear enhanced processing (VSEP), and (iii) pre-softening followed by high-recovery RO. Pilot data generated in Tucson/Marana were used to optimize VSEP operational parameters prior to cost estimation.

1:30 - 2:00pm

Updates on Industry Research: A Summary of New Information and Reports You Need to Know About

Ms. Shonnie Cline

This presentation will provide an overview of current research that benefits utilities in the southwest. Information covered will include research on EDCs, energy, climate change and distribution system water quality.

2:00 - 2:30pm

Assessing and Improving Water Sustainability with Water Reclamation

Dr. Kevin Lansey

Development of measures to quantify indicators for water sustainability and supply resilience is a significant component of the UA's NSF grant on water and wastewater infrastructures. An overview of water sustainability and resilience, the new measures, and the impact of alternatives non-structural system improvements and infrastructure changes on the measures will be discussed.

2:30 - 3:00pm

Emerging Contaminants in Arizona Waters - Pharmaceuticals to Nano-materials

Dr. Paul Westerhoff, Arizona State University

Data collected from surface waters and wastewater effluents from around the State of Arizona were collected and analyzed for emerging contaminants. The results will be discussed as to potential sources and impacts of emerging compounds from both wastewater sources and bodily contact.

3:00 - 3:30pm

Toward Sustainable Water and Wastewater Infrastructure: Recent Initiatives and Next Steps

Mr. Chuck Graf, ADEQ

Two recent sustainability initiatives will be highlighted: the Governor's Blue Ribbon Panel on Water Sustainability, hosted by ADWR, ADEQ, and the Arizona Corporation Commission, and a grant from ADEQ to the Maricopa Association of Governments entitled "Greening Water and Wastewater Infrastructure." These efforts will be described and the crystal ball consulted as to policies, regulatory changes, and research needed to advance Arizona toward sustainable water and wastewater infrastructure.

TRACK 4 - WATER RESOURCES

8:00 - 8:30am

Resource / Distribution System Optimization Leads to Additional Savings

Mr. Brian Biesmeyer, P.E., City of Peoria

The City of Peoria's water and wastewater system service areas encompass approximately 233 square miles and three separate service areas. The focus of the Resource/Distribution System Optimization Study was to identify low-cost technology and operational changes that could be implemented in one year or less with the goals of lowering costs with emphasis on energy savings, improving water resources management, and improving or maintaining water quality. The study team developed a comparative tool to determine which production sources and treatment systems were more cost-effective and determine how to best utilize facilities to meet demands. The study methodology can be easily adapted to most water supply and distribution systems.

8:30 - 9:00am

Squeezing Every Drop For The Future – What To Learn From Chino Valley

Mr. Mark Holes, City of Mesa

9:00 - 9:30am

Flagstaff, Arizona Water Supplies - What is Sustainable?

Mr. Bradley M. Hills, R.G., City of Flagstaff - Utilities

The presentation will provide a history of the City of Flagstaff's water supplies, and an overview of recent water resources planning efforts that include the following: land use and utility billing GIS analysis to determine the City's "build-out" water needs; overview of numerical groundwater computer modeling efforts to help the City determine both the 100-year availability and ultimately sustainability of its local supplies. Lastly an update on the engineering efforts being undertaken to evaluate the feasibility of importing groundwater from the City's Red Gap Ranch will be provided.

9:30 - 10:00am

Planning Strategy in a Changing Climate

Mr. Ron Joost, Carollo Engineers

During this session a perspective of how some utilities are responding to climate change and the impacts that occur to their water resources will be addressed and conclude with a list of relevant experts in the field of climate change whose research can be applied to water resource planning, the design of water and wastewater treatment facilities, and the design of storm water infrastructure.

TRACK 4 - WASTEWATER TREATMENT AND OPERATIONS

10:30 - 11:00am

Innovative Approach to Centrate Nitrification Accomplishes Multiple Goals - Nitrogen Removal and Odor Control

Mr. J.R. (Jim) Coughenour II, City of Phoenix

Following lab, pilot, and full-scale testing, a centrate treatment facility was designed and placed into operation March 2008. The centrate nitrification facility is achieving greater than 50 percent ammonia oxidation to nitrite-nitrate without supplemental alkalinity, resulting in more than a 10% reduction in primary effluent nitrogen. At 135 MGD, the NOx recycle to the headworks doses 2.5 mg/L of oxidized nitrogen. This has reduced influent gaseous H2S concentrations at the headworks odor scrubber by 70%, reducing annual wet scrubber chemical costs by \$100,000. Reducing H2S emissions from uncovered primary sedimentation basins was demonstrated at center wells and effluent weirs. The City will likely avoid spending \$40 million to cover and scrub twelve existing 140-ft primary clarifiers.

11:00 - 11:30am

When Good Instrumentation Goes Bad: The Town of Sahuarita WWTP 1.5 MGD Expansion Start-Up Experience

Ms. Sarah Gurule, Wilson Engineers

The recent expansion to the Town of Sahuarita WWTP increased the treatment capacity to 1.5 MGD and included many upgrades to the plant including converting to an extended aeration process, new continuous backwash filters, the addition of solids dewatering equipment, new full odor control system, increased instrumentation, and a new SCADA system. The new instrumentation promised to provide the operator with valuable information to help with process adjustment decisions. But how would you know if the information the instruments are providing is not accurate? This presentation will focus on the start up after the latest expansion, and will specifically discuss the lessons learned and challenges overcome when good instrumentation went bad.

11:30 - 12:00pm

Gentlemen, Synchronize Your Watches – Maintaining Operations In Expansion Of Chandler's Airport WRF To 15 MGD

Mr. Val Hammer II, Wilson Engineers

With the Airport Water Reclamation Facility (AWRF) operating near capacity, the City of Chandler began construction to increase the AWRF rated capacity from 10 to 15 million gallons per day (MGD). Chandler, Wilson Engineers and McCarthy Building Companies rely on a framework for maintenance of plant operations (MOPO) activities developed during the design phase, allowing the AWRF to run smoothly while expansion of the plant proceeds. This presentation discusses the project team's proactive approach to developing MOPO activities during design, and follows the activities as they evolve during the construction process. Additionally, this presentation addresses the benefit realized from Chandler's considerable investment in wastewater collection system flexibility.

TRACK 4 - WATER DISTRIBUTION

1:30 - 2:00pm

Hydraulic Modeling Yields Surprising Results

Mr. Mike Caruso, City of Phoenix

The City of Phoenix is expanding the treatment process at the Val Vista WTP to include post filter granular activated carbon (GAC) contactors and will require a low lift 220 mgd capacity GAC Contactor & Backwash Pump Station. Due to the large pump station capacity, Hydraulic Institute standards required a physical hydraulic modeling be performed on the influent box conduit and pump trench layout. This presentation will focus on modifications made during initial model testing which led to surprising results that were ultimately included in the final design configuration.

2:00 - 2:30pm

Too Much Pressure? Basic Water System Design

Mr. Roger Gray, City of Phoenix

The City of Phoenix has a complex water distribution system. Six treatment plants and over twenty wells provide water to a 500 square mile service area. The delivery of water must meet demands as well as water pressure requirements. To meet the proper pressure at homes and businesses the city carefully considers elevation, hydraulic grade lines and how this converts to pressure in the distribution system. However this is even more challenging due to the fact that the elevations across Phoenix range from 940 feet at the Salt River to over 2100 feet on the northeast portion of the City.

TRACK 5 - WATER DISTRIBUTION AND TREATMENT

8:00 - 8:30am

Protecting Critical Infrastructure – The City of Phoenix Reservoir Condition Assessment Program

Mr. Steven B. Tidwell, P.E., HDR Engineering, Inc.

In 1985, the City of Phoenix began a program to rehabilitate its large capacity concrete potable water reservoirs. From 1987 through 1997, eight reservoirs were rehabilitated through this program. In 1999, the City retained HDR Engineering, Inc. to perform condition assessments on 17 of its concrete reservoirs. This was completed in 2000. From 2000 through 2009, nine reservoirs have been rehabilitated and one is in process of being replaced. HDR served as design engineer for six of these rehabilitation projects and construction manager for seven. In 2007, the City again retained HDR to re-evaluate the remaining seven reservoirs not yet rehabilitated and to update the condition assessments from the previous project.

8:30 - 9:00am

Union Hills WTP Zone 4 108-inch Manifold Replacement: Repair Options and Design Considerations

Mr. Matthew L. Adams, Wilson Engineers

The Union Hills Water Treatment is currently the City of Phoenix's only source of water to Zone 4 of their distribution system. When in 2008 the City discovered that the manifold's cement mortar lining had failed and that the pipe was corroding, Wilson Engineers was contracted to come up with a solution. Discussed will be the pros and cons of the repair options considered, and compare them with the option of complete replacement on the manifold. And, you will hear about the issues encountered during the design of the manifold replacement.

9:00 - 9:30am

Pilot Aeration Reduces TTHMs

Ms. Erin Pysell, City of Phoenix

In preparation of the new Stage 2 Disinfection Byproducts Rule, the City of Phoenix Water Distribution Division designed, manufactured and constructed a pilot aeration vessel (PAV) to remove TTHMs from the distribution system. Water from the distribution system was piped into a retrofitted hydro pneumatic tank for batch treatment. During pilot testing the PAV was filled to a desired water level. Aeration was applied by passing water through the spray nozzles, bubbling air through the air diffusers or both simultaneously. The incoming water and the aerated water was tested for TTHMs and other water quality parameters. This presentation will evaluate and compare results of the different sample events with the varying aeration methods used at different operating volumes over time.

9:30 - 10:00am

Aeration Strategies for TTHM Control

Mr. Stephen Acquagreda, Damon S. Williams Associates

Many drinking water utilities are considering aeration to comply with the Stage 2 DBP Rule LRAA MCL requirements. While aeration has been studied for TTHM removal for over 3 decades, many present day issues such as applications of aeration in distribution systems, reformation of TTHMs and additional formation of HAA5s upon rechlorination, and energy consumption of optimal aeration approaches must be considered and addressed. This presentation will provide modeling, bench scale, and full-scale testing results; discuss issues including chlorine residual maintenance and additional HAA5 formation upon rechlorination, and compare energy consumption and costs for the aeration strategies from a lifecycle perspective.

TRACK 5 - GREEN/SUSTAINABILITY

10:30 - 11:00am

Cutting WWTP Costs Where It Counts the Most

Mr. Moncef Tihami, City of Scottsdale

The City of Scottsdale evaluated multiple projects to evaluate the most beneficial use of "green building" stimulus money. Recent developments in the turbo blower market led the City to investigate the possibility of replacing existing multistage centrifugal blowers with turbo blowers. After a detailed cost benefit analysis performed by Valentine Environmental Engineers, the City elected to utilize funds to replace blowers at the existing Water Campus, and Gainey Ranch WRF sites, for an estimated annual operations cost savings of over \$200,000 per year.

11:00 - 11:30am

Water System Energy Efficiency and Electrical Rate Structures

Ms. Kara D. Festa, P.E., WestLand Resources, Inc.

Electrical usage is one of the largest operational cost categories for water utilities. A comprehensive program for energy efficiency should review system operation and rate structure factors that affect electrical costs. Basic electrical concepts, power rate structures, specific energy calculations, items that can be influenced by the water utility, and how changes to the water system operation can affect electrical costs will be addressed. You will also hear about a case study of the Avra Water Co-op, a small utility that utilized alternative rate structures to take the "bite" out of high demand charges that came along with their new, larger pumps. The Co-op experienced a 20 percent reduction in power costs and learned a few lessons along the way.

11:30 - 12:00pm

Money Saving Opportunities for Utilities through Solar Energy

Mr. Scott Larson, RBF Consulting

As water utilities have experienced, electrical rates have been increasing considerably over the last few years. With all the electrical power required to operate a water system, now is the time to start saving money by implementing a solar energy program. With recent advances in solar energy equipment and processes, favorable legislation and generous rebates offered by the electrical utilities, it is now possible to save money and lock in energy costs for the future. While saving money the utility can also reduce its CO2 footprint. Our team will discuss methods that make it possible to install solar generating equipment on site at your facilities and opportunities to obtain electrical utility, state and federal rebates.

TRACK 5 - WATER TREATMENT

1:30 - 2:00pm

Pilot Testing of Nitrate-Contaminated Water: Ion-Exchange vs. Biological Treatment

Mr. Kerry J. Meyer, CH2M Hill

The "Triple Bottom Line" evaluation of ion exchange versus biological treatment will be presented as part of this paper. This refers to an evaluation that considers sustainability by evaluating environmental, societal and economic implications when characterizing the overall performance of a given process. Criteria used in the triple bottom line evaluation of ion-exchange vs. biological treatment for nitrate removal will include greenhouse gas emissions, water utilization, residuals quantity, land use, and operator safety, as well as performance and cost.

2:00 - 2:30pm

Uranium Removal in a Multi Contaminant Groundwater Source

Mr. Sami Kader, Water Works Engineers

Uranium often exists in groundwater sources with multiple constituents which require treatment. Design of a multi-contaminant groundwater treatment system must consider all of the constituents that are in the source water. The conceptual and final design of a treatment system for the removal of Uranium in a groundwater source that also requires Manganese removal. We will discuss the process design details that must be considered when removing Uranium in a multi-contaminant groundwater, including process chemistry, equipment selection, backwash management and Uranium waste disposal issues.

2:30 - 3:00pm

Multiple Benefits from a Centralized Pellet Softening Project

Mr. Lawrence Y.C. Leong, Kennedy/Jenks Consultants

The number one consumer complaint for the Valencia Water Company (VWC) is due to hard groundwater (total hardness of 395 mg/L as CaCO3). Fifty-five percent of customers have self-regeneration water softeners (SRWS). The regional wastewater treatment plant has a chloride NPDES limit requiring RO treatment. A study recommended centralized pellet softening that dropped the drinking water hardness by ~50%, eliminating the need of SRWSs, one of the measures for reducing the RO capacity. VWC equipped a 800 gpm well with a pellet softener and conducted a 9 month demonstration. Filter backwash (1.5 gpm) was permitted for local irrigation. The treatment train, O&M costs, a cost-benefit analysis and customers' reaction to the new water quality will be described.

3:00 - 3:30pm

Low-Level Phosphorus Supplementation Enhances Biofiltration Hydraulic Performance And Treatment Efficiency.

Mr. Chance Lauderdale, Carollo Engineers

This study, part of a Water Research Foundation Tailored Collaboration project, focused on evaluating methods for restoring and enhancing the performance of an existing full-scale ozone/biofiltration process through phosphorus supplementation. The findings from this work indicate that biofilter low-level phosphorus supplementation (<0.025 ug/L) can improve hydraulic performance and effluent water quality. Phosphorus supplementation sustainably decreased biofilter headloss by greater than 15% compared to a control. In addition, removals were enhanced for taste- and odor-causing 2-methylisoborneol (MIB) (between 30 and 70%), manganese (between 76 and 83%), and dissolved organic carbon (DOC) (between 50 and 100%).

TRACK 6 - DISINFECTION BYPRODUCTS & DISINFECTION

8:00 - 8:30am

Revisiting the EPA's Stage 2 Disinfectants and Disinfectant By-products Rule with a 2009 Economic Comparison

Mr. Al Roy, MTZ Global Technologies Inc.

Review of the known EPA regulated treatment technologies capable of achieving the U.S. EPA's Stage 2 Disinfectants and Disinfectant By-products compliance goals along with advantages and disadvantages of each. The presentation will compare the general implementation and on-going operational costs of these different treatment technologies with updated estimates for costs last generated by the EPA in their "LT2ESWTR T&C Document," dated December 2005.

8:30 - 9:00am

The City of Mesa's DBP Reduction Master Plan Part 2: WTP and Distribution System Optimization and Implementation

Ms. Jeanne M. Jensen, Damon S. Williams Associates, LLC

The City of Mesa, with assistance from DSWA, prepared a DBP Reduction Master Plan for compliance with the 2012 Stage 2 DBP Rule. The DBP Reduction Master Plan identified both capital and operation and maintenance improvements with supporting cost/benefit analyses and a decision matrix for achieving compliance with appropriate operational safety factors/buffers. Bench-scale testing was conducted at the CAP WTP to determine facility optimization opportunities. Full scale testing is being performed at an operational reservoir in the City of Mesa to verify the DBP reduction efficacies of two selected aeration techniques: surface aeration and spray aeration.

9:00 - 9:30am

"A Tale of Two Models" Optimizing Water Production & Distribution to Meet New Water Quality Goals and Reduce Operating Costs

Mr. Stephen K. Davis, Black & Veatch

As the deadline for compliance with the Stage 2 Disinfectants / Disinfection Byproduct (DBP) Rule nears, water utilities are looking for the optimum method to meet the new water quality standards while maintaining operating costs at the lowest possible level. The City of Glendale used a holistic approach to this task involving both a water treatment process model and a distribution system hydraulic model linked together under a structured operating plan. The models were used to define the complex relationships among the many moving parameters in the system and allow the City to find the optimum operating plan which would meet Stage 2 DBP standards with the lowest overall cost for resources, treatment and distribution.

9:30 - 10:00am

How 3D Modeling Assisted in the Selection of a Chemical Mixing System

Mr. Damien Tonnelle, Wilson Engineers

Due to enhance coagulation practice at the Deer Valley WTP, water pH needs to be lowered during the treatment process and adjusted before entering the reservoirs. According to literature review, THM formation can be reduced and disinfection improved if the chlorine contact time occurs at a lower pH. For this reason, the City of Phoenix decided to add a caustic soda feed point downstream of the reservoirs, well after primary chlorine feed. Wilson Engineers used 3D hydraulic modeling to select a process that would allow caustic soda to ensure optimum mixing in a virtually inaccessible area. This presentation will focus on options that led to the selection of a final design, including feed locations, mixer types and baffle configurations.

10:30 - 11:00am

Selection of Activated Carbon for the Removal of Disinfection By-Product Precursors in Surface Water

Ms. Kendra Shook, Calgon Carbon Corporation

Granular Activated Carbon (GAC) products manufactured from bituminous coal and coconut shell have been used almost exclusively in the removal of taste and odor compounds or disinfection by-product precursors but with some differences in their relative performances noted. Calgon Carbon's presentation will describe the results of side-by-side Accelerated Column Tests (ACT) of three re-agglomerated bituminous coal-based GACs and two coconut shell-based direct activated GACs for the removal of NOM (natural organic matter) as measured by TOC (total organic carbon). Removal of TOC models activated carbon's effectiveness in treating disinfection by-product (DBP) precursors.

11:00 - 11:30am

Balancing Treatment and Disinfection for DBP Control

Mr. Timothy White, Black & Veatch

The White Tanks WTP includes multiple barriers to various pathogens and DBPs. The session will focus on how the plant utilizes the various treatment systems to achieve an overall balanced approach to disinfection and DBP control.

11:30 - 12:00pm

Using Every Tool in the Tool Box - Phoenix Tackles It's Distribution System to Gain TTHM LRAA Stage 2 Rule Compliance

Ms. Michelle DeHaan, Water Works Engineers

In its effort to gain compliance prior to the January 2012 DBP - Stage 2 Rule effective date, Phoenix has determined it is critical that both improvements be made at the surface WTPs and within the water distribution system. This project focuses on improvements which will reduce TTHM concentrations to below the EPA Maximum Contaminant

Level of 80 µg/L based on a Location Running Annual Average (LRAA) and the City's goal of 72 µg/L and will stabilize chlorine residuals to increase or decrease residuals as needed, to reduce THM concentrations. Site specific distribution system improvements are being evaluated and will be implemented from 2009-2012 including reservoir recirculation improvements, remote aeration treatment and/or chlorination system and associated control improvements.

1:30 - 2:00pm
Bench Scale Study of Chlorine Dioxide as a Pre-Treatment Option for THM Mitigation at Chaparral Water Treatment Plant

Mr. Mark Xerxis, City of Scottsdale

This presentation evaluates the use of chlorine dioxide as a pre-treatment option for THM mitigation at Chaparral Water Treatment Plant. The removal of chlorite and arsenic was also investigated using ferrous chloride.

2:00 - 2:30pm
Startup/Commissioning Leading up to Chlorine Dioxide Demonstration Testing at DWWT

Mr. Sreeram Rengaraj, Wilson Engineers

This presentation will focus on the activities leading up to the start of the chlorine dioxide demonstration testing at Deer Valley Water Treatment Plant. This includes design and construction of the chlorine dioxide and all ancillary facilities. The successful completion of startup and commissioning of these facilities in a timely manner will also be addressed.

2:30 - 3:00pm
Using Chlorine Dioxide to Reduce Distribution System THM Formation: Costs, Benefits, and Operational Implications

Ms. Jacqueline Shaw, Malcolm Pirnie, Inc.

Typical doses of ClO₂ used in disinfection range from 1 to 1.5 mg/L; however, some studies have shown that the addition of ClO₂ up to 3 mg/L can reduce THM levels in the distribution system. Although ClO₂ addition may reduce THM formation, it forms chlorite, another regulated DBP. When 3 mg/L ClO₂ is dosed, FeCl₂ must be added to reduce the chlorite concentration to below the MCL. Discussed will be the findings of the full-scale study, including: the effectiveness of using ClO₂ to reduce distribution system THMs, the effectiveness of using FeCl₂ to reduce chlorite, and the associated regulatory and operational requirements.

3:00 - 3:30pm
Batch Test Modeling of Chemical and Biological Interactions that Occur in Chlorinated Drinking Water

Ms. Precious Bijela, Arizona State University

The Expanded Comprehensive Disinfection and Water Quality (CDWQ-E) model, is a dynamic, multi-species model that tracks interactions occurring among nutrient substrates, bacterial biomass, microbial products, and disinfectant residuals that may result in post-treatment water quality decay. We varied type and/or concentrations of electron donor, active biomass, dissolved oxygen, and disinfectant

residual and observed rates of formation and/or depletion of substrate, biomass, microbial products, and disinfectant residual. Modeled water quality trends were similar to trends reported in previous experimental studies. This model is useful for analyzing/projecting water quality decay trends and can be used, within its limits, to forecast post-treatment water quality decay.

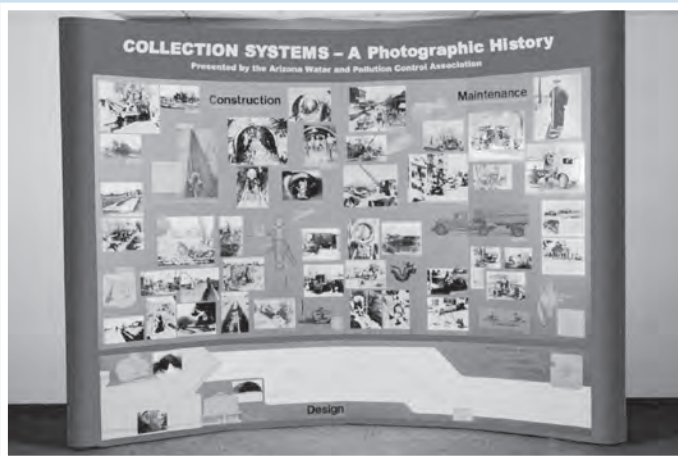
TRACK 7 - COMMITTEE MEETINGS

AZ Water committee meetings have become an important part of the Annual Conference by providing a venue for all committees to come together and meet and introduce their purpose and current activities to interested member volunteers. This is an opportunity for you to network with AZ Water's committee volunteers. Look under Track 7 for committee meetings during the three-day schedule.

SESSIONS AND SPEAKERS ARE TENTATIVE AND SUBJECT TO CHANGE.

REFER TO THE FINAL CONFERENCE PROGRAM GUIDE

WHEN YOU PICK UP YOUR REGISTRATION PACKAGE.



COLLECTION SYSTEM HISTORICAL PHOTO & ARTIFACTS EXHIBIT

AZ Water's historian, Jon Schladweiler conducted the research and provided the energy needed to develop an extensive Historical Photo Display of Collection System activities – including design, construction, operation and maintenance. The photos exhibit sanitary sewage conveyance activities that took place from the 1890's through the 1950's. The exhibit was first displayed at the Water Environment Federation's National Specialty Conference on "Collection System's Operations and Maintenance" held in June 1993 in Tucson, Arizona. After the 1993 exhibition, the Historian began collecting specimens of materials/objects directly related to the sewage collection, conveyance and system maintenance to add to the display. The Historical Photo and Artifacts Display can be viewed during the conference, May 5-6 at the Renaissance Glendale Hotel in the Exhibit Hall.

For further information go to www.sewerhistory.com.