

CONFLUENCE 2019

#CANVSC2019 SPRING CONFERENCE

Where Policy, Operations and Management Converge



March 25-28, 2019 & Sheraton Grand & Convention Center & Sacramento, CA

Please note, this is NOT the final schedule. Sessions may/will change.

## Tuesday, March 26

### Water Treatment

#### 1:30 PM - 2 PM

# A Tale of Two WTPs: GAC vs PAC for DBP Reduction

Participants in this session will learn about two plants treating the same source water and operated by the same staff use different treatment approaches to reduce disinfection byproducts (DBPs): one uses roughing filters, Granular Activated Carbon (GAC), and membranes, and the other uses Powered Activated Carbon (PAC), ballasted clarification and media filtration. You will learn about the operational differences, advantages and disadvantages of GAC and PAC from full scale operational data and Operator interviews.

#### 2 PM - 2:30 PM

## Heavy Hitters: Comparing Where DBPs Were Knocked Down in Two Ozone/BAF Pilot Trains

Participants will learn about DBP formation and reduction pathways evaluated using two parallel pilot treatment trains, one with pre-ozone, one with post-ozone. This work was completed to evaluate process improvement options for two of the City of Nashville's 80 mgd WTPs.

#### 2:30 PM - 3 PM

## Improving San Pablo Reservior Water Quality with Hypolimnetic Oxygenation System to Reduce T&O and DBPs

The participants of this presentation will learn about the water quality study that led EBMUD to select the HOS, the system's layout, design criteria, design challenges, and HOS's performance monitoring plan.

3 PM - 4 PM BREAK

#### 4 PM - 4:30 PM

## Denniston WTP - A Rags to Riches Story

Participants in this session will learn how CCWD overcame short CT, high THMs and unreliable productivity by making some innovative changes to Denniston WTP and the distribution system.

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#### SDWA Committee

1:30 PM - 2:15 PM

## State and Federal Regulatory Update

Participants will hear the latest updates from state and federal regulators.

#### 2:15 PM - 3 PM

## State and Federal Regulatory Update

Participants will hear the latest updates from state and federal regulators (NV focused).

## 3 PM - 4 PM

BREAK

### 4 PM - 4:30 PM Evaluating Risks to the Water Supply

Participants in this session will learn about the identification and management of risks and how it is fundamental to ensuring a safe and reliable drinking water supply. Attendees will hear from a water utility about their process for assessing water supply/quality risks in the distribution system and how they address evolving issues such as microplastics and PFOS/PFOA.

#### 4:30 PM - 5 PM

## Federal Perspective on Risk Assessment and Management

In this session, participants will hear about USEPA's approach to risk assessment and

management and the implications for California and Nevada water agencies.

#### 5 PM - 5:30 PM

## Communicating Risks to your Customers

As the public becomes more aware of potential hazards in our society, the more important it is to effectively communicate to your customers about those risks. This is especially the case when it is related to public health and the water supply. In this session, participants will learn strategies for connecting with customers and explaining the how, what, why, when and where they may be affected, both in an emergency situation and an ongoing basis.

### Materials Performance 1:30 PM - 2 PM Poly-What? Designing with Thermoplastics.

Participants in this session will learn about thermoplastic options. Starting with foundation knowledge the attendee will learn the basic differences of thermoplastics and installation methods. This presentation is geared toward maintenance personnel or in-house engineering staff.



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#### 2 PM - 2:30 PM

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#### 2:30 PM - 3 PM

## AWWA D102-Inside Coating System 3: Better Corrosion Protection of Welded Steel Tanks

Participants in this session will learn about 100% volume solids coatings for welded steel potable water storage tanks including installation and total expected service life.

3 PM - 4 PM BREAK

## Backflow Programs 4 PM - 4:30 PM

## Cross Connection Testing in San Francisco

Participants in this session will learn about Cross Connection Testing in San Francisco and methods and procedures for performing cross connection shutdown tests in dual plumbed buildings in San Francisco.

#### 4:30 PM - 5 PM

### Recycled Water Cross-Connection Test Procedures

Participants in this session will learn about various methods and procedures for performing recycled water cross-connection testing and the positive and negative aspects of each method.

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## *Pipeline Rehabilitation* 1:30 PM - 2 PM

## Pipe Bursting Water Mains -Trenchless Replacement and Rehabilitation

Participants in this session will learn about Pipe Bursting of Water Mains - Trenchless Replacement - Process & Case Studies.

#### 2 PM - 2:30 PM

## Earthquake Resistant Ductile Iron Pipe (ERDIP) as a Countermeasure Against Tsunamis

Participants in this session will learn about another aspect of Earthquake Resistant Ductile Iron Pipe (ERDIP) that was developed in Japan back in 1974. ERDIP is not only highly effective



against large earthquakes, but it is also effective against tsunamis.

#### 2:30 PM - 3 PM

## Corrosion and its Control for Ductile Iron Pipelines

Participants in this session will learn about the criteria to identify corrosive soil environments and how to protect ductile iron pipe from corrosion in these environments with polyethylene and V-Bio Enhanced Polyethylene Encasement.

3 PM - 4 PM BREAK

#### 4 PM - 4:30 PM

## ICE PIGGING – CLEANING MAINS WITH ICE

Participants in this session will learn about the science behind Ice Pigging – how ice has been proven to clean more effectively than water and more easily than traditional pigging.

#### 4:30 PM - 5 PM

## Panel Discussion: Pipeline Rehabilitation vs. Replacement, a Panel Discussion focusing on installation methods, emerging technologies, and lessons learned.

Participants will hear and learn from several pipeline design and construction experts on the

advantages, challenges, and opportunities of pipeline rehabilitation and replacement technologies, suitable conditions for different approaches, and lessons learned; Participants will also have the opportunities to discuss their questions and concerns about rehab vs. replacement

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#### Energy and Sustainability 1:30 PM - 2 PM

## A New Normal: The Confluence of New Electric Utility Requirements and Water Agency Impacts (Panel discussion)

Electric utilities are facing a multitude of new goals and requirements to develop renewable energy projects, enhance energy efficiency and even deenergize power lines in time of increased



fire danger, all of which can impact water agency operations. This panel will explore the new mandates and how water agencies can optimize their systems to address them.

### 3 PM - 4 PM BREAK

#### 4 PM - 4:30 PM

## Leveraging Energy Efficiency Programs and Processes in Water Sourcing and Distribution Systems to Achieve Optimized Operational Performance

High utility costs remain a stubbornly high operating cost for the water sourcing and distribution sector. When considering energy efficiency projects, many water sourcing and distribution utilities can access no-cost support services for identifying, funding, and installing energy efficient retrofits of pumping equipment. In particular, implementing highly efficient operational strategies by utilizing two-way SCADA controls and automated water quality monitoring can yield significant energy and cost savings. The United Water Conservation District's (UWCD) partnership with the Southern California Regional Energy Network (SoCalREN) serves as a case study for simplified energy efficiency project delivery and the cost savings opportunity provided by developing a customized operational strategy based on live metering and sensor data. UWCD, located in Ventura County, CA, maintains the water resources of the Santa

Clara River, its tributaries and associated aguifers. UWCD operates the Oxnard-Hueneme System (OH System), which supplies drinking water to cities and urban areas on the Oxnard Plain. The District supplies about 15,000 acrefeet per year of water and treats water on behalf of public water systems for the purpose of rendering it safe for human consumption. In 2015, United Water enrolled in services with the SoCalREN Public Agency Program, a utility ratepayer-funded program offered to public agency customers of SCE and SCG, and a 3rd party SCE program. The program conducted benchmarking of the District's energy usage, completed energy audits to identify opportunities to improve well pump performance, and captured \$72,937 in utility incentives to help fund overhauls of 5 of the District's well pumps. These projects produced an annual energy savings of 704,793 kWh, or roughly \$70,000 in operating costs. After improving individual pump efficiency, the SoCalREN program considered the District's operational strategy. By implementing advanced SCADA controls that monitored both the energy intensity and water quality for each pump, the District, with the help of SoCalREN, was able to create an innovative pump sequencing approach that maximized run hours on more efficient shallow well pumps while also maintaining MCL limits for nitrate in the system. All of this was achieved with minimal disruption to operations. This project achieved an estimated annual energy savings of over 1.85 million kWh, and the SoCalREN was able to capture \$72,850 to help fund the project. The combined effect of the



pump improvements and the advanced controls strategy has reduced the total annual energy consumption for United Water by an estimated 12% with further potential cost savings resulting from a peak demand reduction of 277 kW. Water utilities should utilize energy efficiency project support services and power utility incentive programs to implement advanced control and monitoring systems that can create projects with substantial impacts on operating costs, service quality, and permit compliance.

#### 4:30 PM - 5 PM

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#### 5 PM - 5:30 PM Water/Energy Bank "Proof-of-Concept" (EPC-16-029)

Participants in this session will learn about the potential to shift the operation of State Water Project water delivery, from summer high energy-demand periods into spring/fall lower energy-demand periods. If the imported water delivers can be shifted seasonally, it enables a reduction in the state's peak hour electric load.

Water Well Technology 1:30 PM - 2 PM TBD: DWR Update on SGMA Implementation TBD

#### 2 PM - 2:30 PM

TBD: DWR Technical Support for SGMA Implementation TBD

#### 2:30 PM - 3 PM

State Water Board Update on SGMA Implementation TBD

3 PM - 4 PM BREAK

#### 4 PM - 4:30 PM

## Streamflow depletion requirements in California's Sustainable Groundwater Management Act: A proposed approach for compliance

Participants in this session will learn about the complex groundwater management challenges associated with addressing depletions of interconnected surface water. While avoiding depletions of interconnected surface water is necessary under California's Sustainable Groundwater Management Act, there is currently a lack of established mechanisms for meeting this requirement. We present a proposed management approach for addressing this objective and limiting impairments to groundwater dependent streams and rivers.



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#### 4:30 PM - 5 PM

## Guidance and tools for mapping groundwater dependent ecosystems for SGMA

Participants in this session will learn a suite of tools and resources available to map, monitor, and manage groundwater dependent ecosystems when developing sustainable groundwater management plans. This presentation will introduce California's GDE mapping database, provide an overview of a fivestep process for considering groundwater impacts to GDEs when preparing groundwater sustainability plans, and provide case study examples on how these tools are currently being used in California.

#### 5 PM - 5:30 PM

## The groundwater manager's dilemma: How to comply with new California law without changing water rights

Participants in this session will learn about the role of groundwater pumping allocations under California's Sustainable Groundwater Management Act (SGMA). Under SGMA, local agencies are tasked with managing groundwater with the goal of bringing groundwater conditions into balance and stopping further depletions and other undesirable impacts, yet they do not have the authority to change or modify groundwater rights. This presentation will focus on considerations for local agencies as they work to devise groundwater allocation schemes, including a discussion of potential methods for establishing baseline groundwater pumping allocations.

#### Operator

1:30 PM - 2 PM

### Program Updates for Drinking Water Operator Certification

Participants in this session will learn about important program changes and updates regarding Drinking Water Distribution and Treatment Certification.

#### 2 PM - 2:30 PM

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## 2:30 PM - 3 PM

## Dewatering Facility Placement and Equipment Selection

Participants in this session will learn about the approach and challenges faced by the City of Napa's Water Division in selecting the appropriate technology and on-site location for a new dewatering facility at the EIB Jamieson Canyon Water Treatment Plant.

3 PM - 4 PM BREAK



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#### 4 PM - 4:30 PM

## Alternatives to Conventional and UDF Hydrant Flushing

Participants in this session will learn about the alternative solutions available to the industry for flushing water main pipelines without discharging water to waste.

#### 4:30 PM - 5 PM

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#### *Communications and Customer Relations* 1:30 PM - 2 PM

## Engaging Customers on Leaks: Beyond Customer Engagement Portals

Participants in this session will learn about the efficacy of current customer leaks solutions, utility customer behaviors and preferences, and how utilities can change their approach to leak management to more effectively resolve leaks and improve customer satisfaction.

#### 2 PM - 2:30 PM

## Tea Time With the Raftelis Ladies -Can Civility Be Returned to the Water Rates Discussion?

Participants in this session will learn about how other local agencies have tried different approaches to communicating and enlisting community accepatance and support of water rate increases. What has and has not worked and why and what are some suggestions for better communication with rate payers?

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3 PM - 4 PM BREAK

## *Leadership Development Committee* 4 PM - 4:30 PM

### **Flash Mentoring Session**

Flash Mentoring Session. Participants will have an opportunity to learn and seek guidance from several highly experienced water Industry



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professionals during this interactive mentoring session aimed at helping Young Professionals become more valuable employees and find greater success in their careers.

#### 4:30 PM - 5 PM

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#### *Environmental, Health & Safety* 1:30 PM - 2 PM

## Health & Environmental Impacts caused by Catastrophic Events: The Side-Effects of Wildfires

Participants in this session will learn about proactive ways to attempt to reduce impact during a fire event, what to do during a fire event to reduce impact, and what to do after a fire event to reduce impact.

#### 2 PM - 2:30 PM

### Utility Operations, Safety & Health, Emergency Prepardeness

This course provides an overview of the essentials necessary to be an effective Essential Responder in the time of Disaster and assisting from a health and safety standpoint.

#### 2:30 PM - 3 PM

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3 PM - 4 PM BREAK

#### 4 PM - 4:30 PM

## Complying with the Statewide General NPDES Permit for Drinking Water Systems Discharges – Lessons Learned and Best Management Practices.

Participants in this sessionwill learn about practices that have been developed since the issuance of the Statewide Permit for Drinking Water Discharges. Participants will also be provided with an update on the effort to revise the CA-NV BMP Manual.

#### 4:30 PM - 5 PM

## Statewide General NPDES Permit- A State Water Resources Control Board Perspective

Participants in this session will be provided an update on the implementation of the CA Statewide General NPDES permit including issues ranging from enrollment status to enforcement.



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#### 5 PM - 5:30 PM

## Everything you wanted to know about the Statewide General NPDES Permit--but were afraid to ask: A Panel Discussion

Participants in this session will gain insight on the CA Statewide General NPDES permit during an interactive discussion between the regulated community and the regulator. Participants will also have the opportunity to have their water discharge questions answered by the experts in the field.

## Security and Emergency Planning 2 PM - 2:30 PM

## America's Water Infrastructure Act – What does S. 3021 mean for water utilities?

Recently passed legislation has new Risk and Resilience requirements for utilities that must be met as soon as March 2020. Other provisions of the legislation will also impact reporting requirements for utilities. This session will review the highlights, deadlines, and requirements for utilities associated with S. 3021, including an all-hazards approach to risk and resilience management and enhancing source water protections.

#### 2:30 PM - 3 PM

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## 3 PM - 4 PM BREAK

#### 4 PM - 4:30 PM

### California and Nevada Water/Wastewater Agency Response Network Meeting

Meeting of California and Nevada Water/Wastewater Agency Response Network.

#### 4:30 PM - 5 PM

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#### 5 PM - 5:30 PM

California and Nevada Water/Wastewater Agency Response Network Meeting

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## Wednesday, March 27

*Water Treatment* 7:30 AM - 8 AM

## Back to the Basics: Challenges and Solutions for Small Systems/Groundwater Treatment -Introduction

This presentation will provide an overview of public water systems that rely solely on groundwater sources, water system sizes, population served and water quality challenges faced by these systems.

### 8 AM - 8:30 AM

## Back to the Basics: Challenges and Solutions for Small Systems/Groundwater Treatment -Arsenic

Participants in this session will learn about challenges and solutions for treating Arsenic in small systems/groundwater.

8:30 AM - 10 AM BREAK

## 10 AM - 10:30 AM

Back to the Basics: Challenges and Solutions for Small Systems/Groundwater Treatment -1,2,3-TCP

Participants in this session will learn about the challenges and solutions for treating 1,2,3-TCP in small systems/groundwater.

#### 10:30 AM - 11 AM

## Back to the Basics: Challenges and Solutions for Small

## Systems/Groundwater Treatment -Chrome 6

Participants in this session will learn about the challenges and solutions for treating Chrome 6 in small systems/groundwater.

#### 11 AM - 11:30 AM

Back to the BASICS: Challenges and Solutions for Small Systems/Groundwater Treatment -Multicontaminants/DBPs and Organics

Participants in this session will learn about the challenges and solutions for treating organics and DBPs in small systems/groundwater.



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#### 11:30 AM - 12 PM

Back to the Basics: Challenges and Solutions for Small Systems/Groundwater Treatment -Questions & Answer Panel Discussion

Question and answer panel discussion on the challenges and solutions for small systems/groundwater treatment.

## 12 PM - 1 PM LUNCH

#### 1:30 PM - 2 PM

#### Low Tech TTHM Removal

Participants in this session will learn how to remove THMs after they form using low-tech solutions.

### 2 PM - 2:30 PM

Designing and implementing sustainable water treatment solutions with small, low-income communities in the US: Field trial of ElectroChemical Arsenic Remediation (ECAR) on a farm in Allensworth, CA

Participants in this session will learn about water quality and capacity issues facing small, lowincome communities in the US, the design process of a field trial of a novel arsenic treatment technology, ElectroChemical Arsenic Remediation (ECAR), in Allensworth, CA, and results from field.

#### 2:30 PM - 3 PM

Fostering Community-Driven Solutions: Policy Tools and Implementation Strategies for the Human Right to Water in California

Participants in this session will learn to address the California water crisis, the Community Water Center acts as a catalyst for community-driven water solutions through organizing, education, and advocacy in California's San Joaquin Valley and Central Coast. We will share current policy tools.

### 3 PM - 4 PM BREAK

#### 4 PM - 4:30 PM

## Economic Feasibility, Affordability & MCL Setting

Participants in this session will learn what the CA SDWA requires in MCL setting with respect to economic feasibility, and how the May 2017 Court ruling on the Cr(6) MCL signifies how the SWQCB reconsiders its approach economic feasibility analyses. Define "affordability" in the context

#### 4:30 AM - 5 PM

## Nitrate Treatment Affordability in California, Three Case Studies

Participants in this session will learn about water affordability in small systems with nitrate contamination.



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#### 5 PM - 5:30 PM

#### Nitrate Treatment: It's Never Easy

Participants in this session will learn about the challenges and solutions that water utilities may encounter when their supplies are impacted by nitrate. The presentation will address capital and operational considerations that can have significant impacts.

#### Research

#### 7:30 AM - 8 AM

## Case Study in Non-Regulated Bacterial Testing

Participants in this study will learn the benefits from evaluating the ENTIRE bacterial environment affecting their systems. When to go beyond regulated coliform and e. coli testing. New information about the contribution of nonregulated bacteria to exis

#### 8 AM - 8:30 AM

## Extraction of Disinfection Byproducts in Potable Reuse and Conventional Drinking Waters for Bioassays

Participants in this session will learn about our novel approach to capturing and concentrating disinfection byproducts in real waters and the relative toxicities of different disinfection byproducts

8:30 AM - 10 AM BREAK

## Water Treatment 10 AM - 10:30 AM Tracer Studies & Delivered Dose (CT) - Drinking Water

Participants in this session will learn about tracer studies and methods for determining the disinfection exposure time (t10) for pathogen inactivation and how to use those results to calculate the pathogen delivered dose for CT compliance.

#### 10:30 AM - 11 AM

## Tracer Studies & Delivered Dose (CT) - Drinking Water

Participants in this session will learn about tracer studies and methods for determining the disinfection exposure time (t10) for pathogen inactivation and how to use those results to calculate the pathogen delivered dose for CT compliance.

#### 11 AM - 11:30 AM

## Circular Raceway Contactors Can Improve Disinfection Credit and Reduce Cost

Participants in this session will learn how a circular disinfection "raceway" contactor can be integrated into a tank design to provide a higher T10 to hydraulic detention time ratio than serpentine baffled contactors typically achieve, thereby resulting in a more efficient disinfection contact



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#### 11:30 AM - 12 PM

## Tracer Studies: the Good, the Bad, and the Ugly.

Participants in this session will learn about the issues that should be considered when planning and conducting a tracer study, and how a tracer test can accurately simulate or fail to determine a contactor's T10 to HDT ratio.

## 12 PM - 1 PM LUNCH

#### Research

1:30 PM - 2 PM

## Microplastics: Overview & California Legislation

Participants in this session will receive an overview and details of the legislative process that took place to develop two senate bills (SBs 1422 and 1263) to establish a statewide microplastics strategy and to regulate microplastics in drinking water.

### 2 PM - 2:30 PM

## Occurrence and Removal of Micro-Plastics During Drinking Water Treatment on the Great Lakes

Recent news reports have indicated that municipally treated drinking water may contain microplastics. These materials have been observed in untreated water supplies around the world, including North America, however their removal during drinking water treatment.

## 2:30 PM - 3 PM

## Microplastics: Exposure and Health Effects

Participants in this session will learn how humans are exposed to microplastics and the effects on health. This research summary will also identify a framework for understanding, describing, and communicating microplastics health effects that would be useful for drinking water agencie

3 PM - 4 PM BREAK

#### *Research* 4 PM - 4:30 PM

# Planning Considerations in the face of Change

Climate change is increasingly affecting water agency operations, from water supply concerns to water quality challenges. Participants in this session will learn about the importance of planning activities and programs in light of the "new normal."

## 4:30 PM - 5 PM

## California's Fourth Climate Change Assessment

California's Climate Change Assessments contribute to the scientific foundation for understanding climate-related vulnerability at the local scale and informing resilience actions, while also directly informing State policies, plans, programs, and guidanc



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#### 5 PM - 5:30 PM

### Local Climate Change in Pasadena, CA

Participants will learn how local climate change impact a surface water source for a California public water system

## Distribution System Water Quality 7:30 AM - 8 AM

## Lead Testing in California School

Community Water Systems (CWSs) serving K-12 schools in California under different bills and permits. CWS were required to work with school to develop a sampling plan, identify up to five sample locations, collect samples according to a guidance document,

#### 8 AM - 8:30 AM

## Lead Testing in California School

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## 8:30 AM - 10 AM BREAK

#### 10 AM - 10:30 AM

## Chloramine Disinfectant Residual Optimization and Management in Distribution Networks

Participants in this session will learn how Chloramination is a successful disinfectant strategy in potable water systems provides benefits such as a lower potential for disinfection byproduct formation (THMs) and improved disinfectant persistence in distribution systems.

## 10:30 AM - 11 AM

Hydraulic Modeling and Unidirectional Flushing (UDF): A Case Study in Burlingame, CA Demonstrates how UDF Modeling Tools Can Help Reduce Flushing Volumes and Simplify Flushing Operations

Participants in this session will learn how effective planning for a unidirectional flushing program can be achieved by combining hydraulic modeling analysis with operational strategies. The end results are significant saving in flushing water volumes and simplified operations.

### 11 AM - 11:30 AM

## The Devil is in the Details – Development and Rollout of an Interactive Water Quality Data Portal

City of Sacramento Department of Utilities (DOU), in partnership with our consultant team, designed and rolled out an interactive Water Quality Data Portal. Our goal in developing the data portal was to move beyond a static, listform water quality webpag





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#### 11:30 AM - 12 PM

#### Active Control of THM Levels in Drinking Water Distribution Systems

With the promulgation of the EPA's Stage 1 and Stage 2 Disinfection Byproduct Rules, water treatment operators and utilities scrambled to ensure their plants were in compliance with THM limits and more carefully monitored chlorine dosing – or switched to

## 12 PM - 1 PM LUNCH

#### *Water Loss Control* 1:30 PM - 2 PM

## Customer Meter Testing: Matching a Testing Program to Your Goals

This session will discuss the goals that can guide customer meter testing program and the testing programs that can meet those goals. This session will also discuss the challenges or shortcomings of customer meter testing so that you can embark on custome

#### 2 PM - 2:30 PM

## California Energy Commission Funded Case Study in Leakage Reduction Technologies – Acoustic Monitoring, Satellite Imagery, and Smart PRVs

Participants in this session will learn from a California Energy Commission research project implemented in California American Water systems about the deployment and evaluation of three (3) leakage control technologies: acoustic monitoring by Echologics, satellite imagery leak detection.

#### 2:30 PM - 3 PM

## Two Years and Counting: A Review of the Water Loss Audit Reports in California

Participants in this session will learn further about the use of Water Loss Audits as a tool for bettering water management practices related to audit methodology

3 PM - 4 PM BREAK

#### 4 PM - 4:30 PM

## The process of performing and validating an AWWA Water Audit

Participants in this session will learn about the data collection process, the process of filling out the water audit, and the validation process as required by SB555

#### 4:30 PM - 5 PM

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#### 5 PM - 5:30 PM

#### Understanding Non-Revenue Water Loss with Powerful Analytics

Participants in this session will learn about new analytical tools and methods to better understand water loss, discover patterns and trends in historical data, and make better decisions when it comes to water main repair and replacement.

#### **Systems Controls**

7:30 AM - 8 AM

# Getting the most out of your SCADA system

Participants in this session will learn how to optimize their SCADA system to get the most out of it. The talk will be looking at continuous SCADA improvements, SCADA screen optimization, operator training, and knowledge transfer to technical staff to mak

#### 8 AM - 8:30 AM

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#### 10 AM - 10:30 AM

SCADA in the New World: The Changing Landscape of IIoT and Mobility

Participants in this session will learn about necessary steps and best practices for navigating the changing landscape of IIoT and Mobility. This session will discuss practical tools you can leverage today.

#### 10:30 AM - 11 AM

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#### 11 AM - 11:30 AM "What's in a Name?"

Participants in this session will learn how device tag names, software variable names, and tagging schemes can impact a treatment and distribution system.

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## 12 PM - 1 PM LUNCH

#### 1:30 PM - 2 PM

## Implementation of Automation Projects Using a SCADA Master Plan

Participants in this session will learn about SCADA Master Planning and how to mitigate inconsistencies in automation design and utilization

#### 2 PM - 2:30 PM

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## *Recycled/Desalination Committee* 2:30 PM - 3 PM

## SCADA Panel Discission

Participants in this session will share lessons learned and problem solving related to today's SCADA industry.

#### 4 PM - 4:30 PM

## The Future of Automation in the Water Industry

Participants in this session will learn how to tackle the challenges facing the industry today with modern control solutions. Discuss considerations when choosing or upgrading a control system, technological advancements in the industry, and methods of ensuring security (cyber & physical).

#### 4:30 PM - 5 PM

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### 5 PM - 5:30 PM

## MOD Bust: Capturing Real Time Production Meter Reads with Your PLC

Participants in this session will learn the benefits of by-passing pulse reads from a production meter and reading staight from the meter head with a PLC

#### Tanks Reservoirs Structures 7:30 AM - 8 AM

### Water Storage Tank Coating Systems: Revisions to the AWWA D102

Participants will learn what updates and changes have been made to the AWWA D102 standards.



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## 8:30 AM - 10 AM BREAK

#### 10 AM - 10:30 AM

## What Owners and Engineers should know to eliminate corrosion inside steel tanks

Participants in this session will learn about various options available to him to lower corrosion opportunities and make their coatings last much longer.

#### 10:30 AM - 11 AM

### How to address Infrastructure Replacement Quicker In 2019

Participants in this session will learn about financing options and how to evaluate how justify the cost for implementing solutions

#### 11 AM - 11:30 AM

## Conserving Water by Making Data Actionable

Participants in this session will learn how data that is already available to them can be used to better manage the way they run their system for increased optimization

#### 11:30 AM - 12 PM

## System Wide Storage Tank Replacement in Remote California

Participants in this session will learn about the project, hydraulic considerations made and timing of the tank replacement to continue service to Shelter Cove, as well as the challenges of completing the project in such a remote part of the state, the condition of the orig

## 12 PM - 1 PM LUNCH

#### 1:30 PM - 2 PM

Economic Analysis of Water Quality Management Alternatives for Palo Alto's Foothills Emergency Storage System

Participants in this session will learn the Pros and cons of various water tank mixers and chlorine residual control systems; how economic analysis can help to inform decision-making

#### 2 PM - 2:30 PM

## A Systems Approach for Improving Water Quality

Participants in this session will learn that by utilizing the latest advances in potable water tank mixing, Trihalomethane (THM) removal and residual monitoring and boosting an operator can have improved water quality at less cost today that what was previously attainable.



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## 3 PM - 4 PM BREAK

### 4 PM - 4:30 PM

# Evolution of GIS – The Journey from Map Books to Tough Books

Attendees will have the opportunity to share and learn from the City's experience. Learning outcomes will include, but not be limited to the following: • How development of the Water Division's computerized maintenance management system helped/hurt the

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# Evolution of GIS – The Journey from Map Books to Tough Books

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Participants in this session will learn how to use software to perform real time failure prediction analysis on entire water or wastewater networks using the utility's own data and have this capability available real-time as new data is continually acquired

### 8 AM - 8:30 AM

## Selecting the right CMMS- Case Studies

Participants in this session will learn the steps towards identifying and procuring a new CMMS that can meet the diverse business needs of their agency such as staff, budget, and most importantly their assets.

8:30 AM - 10 AM BREAK

#### 10 AM - 10:30 AM

## An Innovative Optimization Model for Repair/Replacing of Water Meters

Like all mechanical devices, water meters always degrade in accuracy over time, resulting in an increasing amount of lost revenue. Unlike the conventional approaches to determine the time





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of replacing meters, this presentation provides information.

#### 10:30 AM - 11 AM

## Detecting Potable Water Leaks using Remote Satellite Sensing

This session will provide details on the Utilis satellite radar technology and how the data collected can be analyzed to accurately and cost effectively detect leaks. Value proposition and performance metrics of multiple case studies will be discussed.

#### 11 AM - 11:30 AM

## 20-Year Anniversary of Tucson Water's Pipeline Protection Program (PPP)

Participants in this session will learn how one water utility recovered from a critical water pipeline catastrophic failure

#### 11:30 AM - 12 PM

## Apply EPA's AM Framework to Optimize Your O&M - Case Studies

Participants in this session will learn from recent case studies on how application of the EPA's AM Framework puts to the test the principles/practices of asset management. The right approach to managing assets is critical when you want to optimize O&M wo

12 PM - 1 PM LUNCH

## Security and Emergency Planning 1:30 PM - 2 PM Lessons Learned from the California

## Wildfires

A series of wildfires in California in 2018 blazed through the state, directly affecting hundreds of thousands of people. Participants in this session will learn about the effects the fires had on local utilities and lessons learned from wildfire respons

#### 2 PM - 2:30 PM

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#### 4 PM - 4:30 PM

## Black Sky – what a catastrophic emergency means for utilities

In this session, a series of speakers will introduce the concept of a "Black Sky" event – a widespread catastrophe that disrupts essential infrastructure for extended periods of time. They will review utility reliance on power and communication systems,

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## Water Well Technology 7:30 AM - 8 AM Well Screen Performance and Efficiency Optimization

This presentation will highlight the evolotion of manufactured ground water production well screens combined with improvements in gravel envelope design and well development techniques which have lead to higher expectations in well performance. Laboratory

## 8 AM - 8:30 AM RISD a New Well Rehabilitation Approach

Participants in this session will learn how injection development methods adoped for the ASR industry have been sucesfully applied to potable production wells to restore and even improve performance.

8:30 AM - 10 AM BREAK

#### 10 AM - 10:30 AM

How Groundwater Models Can Help Plan Future Well Projects to Meet Water Needs A Case Study in Using Groundwater Modeling to Help Design and Locate Wells

Participants in this session will learn how groundwater modeling allows managers to identify potential project locations and detect key areas where additional information may be required. Field investigations can then be



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planned to maximize hydrogeologic understanding and minimize data costs.

#### 10:30 AM - 11 AM

## Gravel Pack Design to Maximize Well Capacity and Minimize Sand Production

This talk is structured to compare gravel pack design alternatives and installation methods. The goal of this talk is to illustrate how to improve well efficiency and reduce sand production.

#### **11 AM - 11:30 AM** Water Well Applications for Double Spline Lock Fittings

Attendees in this session will learn about different end fittings used for water well casing and pump column. Specifically this track will introduce the Double Spline Lock fitting as another option for well designers and contractors to consider when const

### 11:30 AM - 12 PM

## Development of a GIS-Based Methodology for Identifying and Ranking Prospective Sites for Public Supply Wells within a Large Urbanized Area

Participants in this session will learn about the application of industry-standard GIS-based techniques that facilitate the site screening process to identify the most viable public supply well sites for further evaluation.

## 12 PM - 1 PM LUNCH

## **Recycled Water and Desal** 1:30 PM - 2 PM Ozone/Biofiltration Application in Potable Reuse

This presentation will discuss optimization of O3/BAF system used in potable water reuse. To help assess the system performance and rapidly identify performance anomalies, a performance tracking tool (i.e., Proformance) was used, which allowed timely.

## 2 PM - 2:30 PM

### Maximizing Groundwater Use in the Central and West Coast Basins through Recycled Water from Hyperion

Participants in this session will learn: The efforts currently underway by the City of Los Angeles to maximize reuse of recycled water and create a sustainable local water supply. These efforts include a Nitrification-Denitrification Membrane Bioreactor P

## Recycled Water and Desal 2:30 PM - 3 PM

## Addressing Potable Reuse Operator Certification Needs - The AWTO Certification Program - A Joint Effort Between CA/NV-AWWA and CWEA

CA-NV Section AWWA and CWEA have developed a program to address the absence of significant testing on advanced water treatment topics in





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the existing Operator Certification Program for water and wastewater operators. This presentation will give an overview.

## 3 PM - 4 PM BREAK

#### 4 PM - 4:30 PM

## Lessons from a pilot study: strategies for managing tradeoffs between pathogens and disinfection byproducts in wastewater recycling for potable reuse

Participants in this session will learn the outcomes of a pilot study on tradeoffs between pathogen inactivation and disinfection byproduct formation during sequential chlorine and chloramine disinfection for wastewater reuse, and a promising new strategy for minimizing NDMA formation during ch

#### 4:30 PM - 5 PM

### Tracer Studies & Delivered Dose (CT) – Disinfected Tertiary Recycled Water

Participants in this session will learn about tracer studies for determining the modal contact time for disinfected tertiary recycled waters and to use those results to calculate the pathogen delivered dose for CT compliance.

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## *Leadership Development Committee* 10 AM - 10:30 AM

#### SDCWA's Approach to Attracting New Talent

Participants will learn about the SDCWA efforts to use their innovation and education programs to attract and hire new staff. This includes using social media, industry and community events to showcase innovative technologies and programs, and the divers

#### 10:30 AM - 11 AM

# Zone 7's Efforts to Retain Staff in Operations

The Operator's job market in California is very aggressive. As a water utility manager you not only have to think about wages and shift differentials, but also commutes, the cost of living and the fact that the majority of the operator staff is on the ve



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#### 11 AM - 11:30 AM

## Expert Panel focused on Enhancing Water Industry Recruitment and Retention

Participants will be able to ask the expert panel specific questions about outreach and marketing strategies in order to develop effective recruitment and retention programs for their own agencies.

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## 12 PM - 1 PM LUNCH

### 1:30 PM - 2 PM

BAYWORK—the opportunities and challenges of collaborative approaches to candidate development and outreach in the water and wastewater industry

In this session, participants will learn about the successes and challenges that San Francisco Bay Area water and wastewater utilities have encountered in their efforts over the past decade to coordinate regional approaches to candidate development.

## 2 PM - 2:30 PM

## Workforce Development and Succession Planning at SFPUC

In this session, participants will learn about the current workforce development and succession planning initiatives and strategies underway at SFPUC.

### 2:30 PM - 3 PM

## Effective Leadership Development for LADWP's Water Distribution Division

Participants in this session will learn how the LADWP structures and runs an effective management and leadership development program for its large and diverse water distribution workforce. The multiple avenues the Water Distribution Division uses.

3 PM - 4 PM BREAK

## 4 PM - 4:30 PM

## Preparing for 2025: MWD's Succession Plan for Engineering

Participants will learn about specific succession planning strategies that can guide organizations undergoing large amounts of employee turnover. The presentation will cover Engineering Services' current orientation programs that help bring new employees



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#### 4:30 PM - 5 PM

## Expert Panel Focused on Developing Effective Sucession Planning Strategies

Participants will be able to ask the expert panel specific questions about succession planning and mentoring strategies in order to develop effective programs for their own agencies.

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#### Meter

#### 7:30 AM - 8 AM

## The Evolution of Meter Management Practices: Testing, Replacement and Revenue Protection

Participants in this session will learn about apparent water loss and why it matters to utilities, Find out about current and future water loss regulations, Identify eight forms of apparent loss and unbilled water, Apply learned concepts to a specific utility.

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Like all mechanical devices, water meters always degrade in accuracy over time, resulting in an increasing amount of lost revenue. Unlike the conventional approaches to determine the time of replacing meters, this presentation provides information.

#### 10:30 AM - 11 AM

## C715 Test Bench Compatibility to Support Ultrasonic & Electromagnetic Meter Testing

# Participants in this session will learn the value of periodically checking meter and AMR/AMI scrap pile.



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#### 11 AM - 11:30 AM

## How to Use Portable Meter Testers

Participants in this presentation will learn the importance of large meter testing and hands-on, how to use a portable large meter tester.

#### Meter

#### 11:30 AM - 12 PM

## Factors Affecting Meter Accuracy

Participants in this presentation will learn what factors affect meter accuracy in order to make smart meter choices and to help determine meter testing program parameters.

## 12 PM - 1 PM LUNCH

#### 1:30 PM - 2 PM

### **AMI Customer Service Panel**

The meter committee panel is sponsoring this panel of utilities who have deployed fixed network meter reading systems with customer portals and smart phone applications. Participants will have the opportunity to ask the utilities questions regarding how .

#### 2 PM - 2:30 PM

## Got Meter & AMR Transmitter Scrap? Trash or Treasure? What is it telling you?

Participants in this session will learn the value of periodically checking meter and AMR/AMI scrap pile.

#### 2:30 PM - 3 PM

## AMI Compatible Meter Pit Lids

Participants in this presentation will learn which types of meter pit lids provide the best radio frequency propagation and why; sizes and load ratings available for retrofits in various applications/conditions; and features that should be considered when

3 PM - 4 PM BREAK

#### 4 PM - 4:30 PM

## Lessons Learned in Sacramento on DMA Implementation

Participants in this session will learn how Sacramento designed and implemented pilot District Metered Areas (DMAs) and is evaluating the feasibility of DMA management for its Water Loss Control program. Participants will learn about the tools that support real-time dataviewing and reporting.

#### 4:30 PM - 5 PM

## AMI Panel – Everything that you ever wanted to ask a utility about Advanced Metering Infrastructure

The meter committee panel is sponsoring this panel of utilities who have deployed fixed network meter reading systems. Participants will have the opportunity to ask the utilities questions regarding how the technology has been implemented, changed managem



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#### Operator

#### 7:30 AM - 8 AM

## Jar Testing Made Easy

Participants in this session will learn about practical jar testing procedures in obtaining meaningful results.

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8:30 AM - 10 AM BREAK

#### 10 AM - 10:30 AM

## Optimizing Polymer Efficiency for Improved Solids Separation

Despite the wide-spread use of polymers in water and wastewater treatment and their high recurring expense, there are very limited technical resources readily available to the many interested engineers and operators. With many equipment options available

#### 10:30 AM - 11 AM

## Optimizing Polymer Efficiency for Improved Solids Separation

Despite the wide-spread use of polymers in water and wastewater treatment and their high recurring expense, there are very limited technical resources readily available to the many interested engineers and operators. With many equipment options available

#### 11 AM - 11:30 AM

## Forgotten Assets – A City's look at Air-Release Valves on the Distribution System

Participants in this session will learn the perspectives of air-release valve installations within a flood way, resizing undersized facilities, finding hidden assets, actual cost of maintaining non-standard locations, working with customers on visual impacts, things to consider during design, commo

12 PM - 1 PM LUNCH

### 1:30 PM - 2 PM Operators Round Table

Water treatment professionals share experience with each others successes and failures. Come with your industry problems and solutions.



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#### 2 PM - 2:30 PM

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Water treatment professionals share experience with each others successes and failures. Come with your industry problems and solutions.

3 PM - 4 PM BREAK

#### 4 PM - 4:30 PM

## Keep it Out! Operator Tools and Resources for Watershed Spills

Since watershed spills/discharges have the potential to impact source water quality and water treatment plant operations, notification is the first line of defense. This presentation will provide information on a local water utilities voluntary notification.

#### 4:30 PM - 5 PM

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## Thursday, March 28

Water Treatment 8 AM - 8:30 AM

## What's up with PFAS?: Introduction to the Challenges and Solutions for Perfluorinated Compounds

Participants at the session will learn about new developments in PFAS and PFOA toxicological evaluations and subsequent current and potential future regulatory activities with respect to perfluorinated compound treatment requirements.

#### 8:30 AM - 9 AM

## Determination of the Effectiveness of Granular Activated Carbon for the Removal of PFAS Precursor Compounds

Participants in this session will learn about the effectiveness of activated carbon for removing PFAS precursor compounds.

### 9 AM - 9:30 AM

### Resin Treatment Technology for PFAS - How it Worked in Southern Colorado

PFAS is an emerging contaminant affecting many water districts. This presentation will show ion exchange can be a viable treatment method for the removal of PFAS.

9:30 AM - 10 AM BREAK



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## Research 10 AM - 10:30 AM Wildfire Impacts on Water Quality & Treatment

Participants in this session will learn about changes in source water quality that might occur following a wildfire, and the consequences for treatment process performance. Results from several Water Research Foundation projects will be discussed, including recommendations and guidance for utilities to plan and prepare for a wildfire.

#### Water Treatment

American Water Works Association

10:30 AM - 11 AM Multicontaminant Removal -

## Simultaneous Removal of Nitrate and Arsenic

Participants in this session will learn about simultaneous removal of nitrate and arsenic in a biological system that combines biological and physical-chemical contaminant removal mechanisms.

#### 11 AM - 11:30 AM

#### **Biological Selenium Removal: Total** System Optimization

The San Luis Demonstration Plant was constructed in 2014 to determine the best 'invalley' solution to agricultural drainage management, implementing biological treatment for selenium removal. The demonstration facility operation commenced in early 2016.

The selenium removal process biologically reduces oxidized selenium into insoluble elemental selenium under anaerobic conditions. The first stage of ABMet removes oxygen and nitrate, and selenium reduction occurs primarily in the second stage. An external carbon source is added due to lack of an electron donor in the feed water. Elemental selenium is filtered by biomass and bioreactor media, and removed with excess biomass by during a backwash, although a net rate of accumulation in the process has been determined through mass balances.

Process controls implemented chemical oxygen demand (COD) monitoring across the bioreactor and maintaining a between a -250 to -300 mV oxidation-reduction potential (ORP) in the effluent from the second stage. It was determined that optimal operation required the maintenance of a carbon dosing scheme using a constant COD:N ratio with additional carbon to account for dissolved oxygen demand based on daily nitrate monitoring coupled with periodic dissolved oxygen measurements. Differences in bioreactor feed and effluent dissolved organic matter (DOM) concentrations were analyzed, demonstrating a net reduction of 4 mg-C/L, indicating biomass consumption of DOM. Fluorescence and size exclusion chromatography were used to characterize changes in DOM across the bioreactor. Effluent selenium concentrations were between 1 and 3 [g/L] during typical bioreactor operation (98-99% removal), although higher effluent concentrations were measured following



backwash events. In addition to grab laboratory samples, online selenium analysis was implemented to determine bioreactor performance, which was demonstrated to be a viable monitoring technique that responded to changes or operational problems more rapidly than ORP measurements.

During winter 2017, excess biomass and a filamentous fungus infestation limited treated water production. A headloss inducing granular form of biomass was identified on top of the bioreactor. Shock and feed water chlorination coupled with air scouring the bioreactor was implemented to address biomass and fungal growth, while maintaining effluent selenium removal. Analyses on changes in seasonal biomass are being DNA sequenced to determine temperature impacts on biology. This paper presents detailed analysis of carbon dosing optimization, macronutrient balancing, bioreactor selenium removal performance, optimal monitoring techniques, biological DNA sequencing and measures taken to address seasonal operational issues.

#### 11:30 AM - 12 PM

## Optimizing Polymer Efficiency for Improved Solids Separation

Participants in this session will learn about factors such as charge site exposure, uncoiling of polymer molecules, application of mixing energy and the effects of dilution water as they influence proper polymer activation

## Source Water Quality 7:30 AM - 8 AM Monitoring tools to help save time & money while managing changing water sources

Drinking water systems and water treatment plants all face unique water quality challenges that affect treatment decisions, operational costs, and regulation compliance. In addition, water quality can change seasonally, with storms, with industrial effluents, and with location. For example, two plants nearby one another both sourcing from the same river could have different water quality challenges. Two water systems were analyzed in this study for their management of two separate plants with different source waters and how they use monitoring tools to stay in regulation compliance for disinfection byproducts (DBPs) rules and optimize treatment processes to save costs.

The first water system manages a conventional plant sourcing from mountain runoff and a membrane plant from a lake system. This water system also has a changing population throughout the year due to tourism in conjunction with seasonal water quality changes. These water quality challenges differ depending on the source: the mountain runoff has high organics in the springtime and the lake system has high levels of taste, odor, and organic compounds in the summer. As it is a relatively small system, the plant tries to optimize water production to capture the best water quality throughout the year and to meet production demands, via Total Organic Carbon (TOC)



analysis. To do so, they have implemented preventative monitoring of organics, a main contamination contributor to the system. This monitoring is applied to optimize pre-treatment to the membrane plant to prevent membrane fouling, control chemical dosing to the conventional plant, indicate when to switch or adjust which plant(s) is online, and to ensure regulation compliance as their lab is certified for reporting TOC to meet DBP rules.

The second water system provides most water from a plant fed by mountain runoff with a second peaking plant sourced from a river. The first plant has seasonally high organics in the springtime like the former system and that is coupled with low alkalinity, placing them in a high TOC % removal bucket to meet DBP rules. Collaboration with local regulators led the plant to implement onsite TOC analysis to monitor changes in raw water and determine the best treatment to remove TOC. Knowing TOC allowed them to achieve compliance throughout the year with more consistent quality effluent. The river plant has no issues meeting TOC % removal due to a higher alkalinity, but seasonal taste & odor issues have led them to investigate different treatment options. The river plant is also a zero discharge facility where backwash water from their filters is returned to be re-treated at the front of the plant. Monitoring TOC throughout the process has helped them minimize taste & odor issues and manage retreatment of backwash water.

While having two plants within a small water system can help during peaking conditions or

when upgrades are required, it can be difficult to manage separate sources with different water quality challenges. This study describes these two water systems and what changes they have made via onsite TOC monitoring to save time and money. Onsite monitoring of organics, a simple, reliable, and robust method indicating organic loading, helps operators make data driven decisions to optimize treatment processes and better comply with DBP regulations.

#### 8 AM - 8:30 AM

#### Maximizing Resource Efficiency via Controlled Raw Water Withdrawal

Traditionally, lakes and impounded surface waters have provided distinct challenges for drinking water treatment facilities. Episodes of taste and odor, or iron and manganese can create negative PR outcomes. Turbidity spikes can result in increased chemical usage. Effectively dealing with these types of surface water challenges places increased stress on operators and raises operating costs. We hypothesize that these undesirable outcomes can be avoided entirely by proactive selection of optimal source water.

Reservoirs were invented circa 3000 BC, yet 5000 years later many aspects of the technology leave room for improvement. Water quality parameters vary widely throughout a reservoir, but most have limited options, if any, when it comes to choosing the point of withdrawal. This presentation explores our solution to that problem: allowing water treatment plants to



identify and select that ideal albeit dynamic layer of better source water in real time.

The presentation details an ongoing full-scale trial at a Georgia surface water treatment facility, which is evaluating the importance of understanding reservoir depth profile data set and demonstrating the value proposition associated with applying whole profile raw water selection capabilities.

Trial generated data using selected profile influent conditions under varying water quality conditions along with downstream treatment observations and measurements are being compared with historical knowns from decades of water treatment plant operations.

The trial is currently at the end of its first year and has provided data collection and performance evaluation opportunities associated with seasonal reservoir turnover, cyclical cooling and warming trends and transients due to rain events. Real water treatment plant operational cost savings have been demonstrated via chemical reductions, i.e. 30-50% lower powdered activated carbon dosing as part of addressing T&O in the distribution system.

There may be significant value in having source water management and raw water pretreatment tools designed to allow, in real time, operator understanding and control of the water quality drawn into the treatment plant influent. The subject ongoing study is providing important reservoir characteristics, cost of treatment, and risk management information for surface water users and treatment plant operators.

#### 8:30 AM - 9 AM

## Water Planning for the Capital City -The Fastest Growing Big City in California

In 2018 the State Department of Finance determined that the City of Sacramento (City) is the fastest growing large City in California. The City Department of Utilities (DOU) completed a water supply master plan (WSMP) that identified the need for 410 million gallons per day (mgd) of surface water by 2050 as part of a conjunctive use program.

The City currently operates two surface water treatment plants. The E.A. Fairbairn Water Treatment Plant (EAFWTP) is located on the American River and rated at a hydraulic capacity of 200 mgd, and currently permitted capacity of 160 mgd. However, EAFWTP is unable to operate reliably at capacity due to environmental agreements that frequently limit diversion to 100 mgd during summer months, and other reduced rates during various times of the year. The Sacramento River Water Treatment Plant (SRWTP) has a reliable capacity of 160 mgd. Together, the two plants provide 260 mgd of reliable surface water during peak demand season. To meet the projected demand of 410 mgd, the City will need to develop 150 mgd of additional capacity.

DOU performed an alternatives analysis to develop and evaluate surface water supply alternatives as part of their overall water supply



program. The Project consisted of two phases of work: Phase I (completed in 2017) evaluated water supply options and recommended an alternative to meet projected future water demands; Phase II consists of implementation of the recommended alternative. Alternatives included various combinations of a new surface water intake on either the American River or Sacramento River, raw water conveyance to either the EAFWTP or SRWTP, surface water treatment expansion or improvements, and transmission system improvements to convey the additional potable water.

In this presentation, attendees will learn about the alternatives that were developed to meet the forecasted 2050 water demands, the challenges and costs associated with each, the decision criteria used to select a direction forward, the planned phasing, and the status of the Phase II Project implementation.

#### 9 AM - 9:30 AM

## Are We Ready for Cyanotoxins? Evaluating reservoir and treatment plant options to manage cyanotoxins and related water quality challenges

The Southeast Morris County Municipal Utilities Authority (SMCMUA) in New Jersey recently evaluated its use and treatment of water from the Clyde Potts Reservoir (Reservoir) to address challenges with algal growth, taste and odor compounds, cyanotoxins, and apparent increases in total organic carbon, iron and

manganese. The Reservoir is one of several water sources used for SMCMUA's potable water production, and SMCMUA needed an operational support tool to manage water quality and balance use of the Reservoir with other blended sources to meet seasonal demands. The water quality management project included an indepth limnological study and evaluation of the current diffused aeration system in the Reservoir as well as a review of unit process performance and historic finished water quality from the Clyde Potts water treatment plant (CPWTP). The existing diffused aeration system was put in place to oxidize iron and manganese and manage dissolved oxygen levels throughout the Reservoir water column, and the CPWTP has advanced treatment processes including membrane ultrafiltration, post filter granular activated carbon contactors, and free chlorine disinfection. This presentation will highlight SMCMUA's efforts to develop operational decision support tools for the Reservoir and the CPWTP, review short- and long-term recommendations, and balance the use of multiple sources.

Given the increasing occurrence of cyanotoxins in surface water supplies, and USEPA's release of health advisories for two cyanotoxins, surface water utilities are actively pursuing management strategies for mitigation of harmful algal blooms (HABs) and cyanotoxins in their water supplies. This presentation will be instructive for both large and small water system operators, engineers, and managers that are currently engaged in evaluation, selection, and



March 25-28, 2019 & Sheraton Grand & Convention Center & Sacramento, CA

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implementation of HAB mitigation strategies in their source waters and treatment plants.

#### 9:30 AM - 10 AM BREAK

#### 10 AM - 10:30 AM

## #ReddingStrong - City of Redding Water Utility's outstanding response to the 2018 Carr Fire

Participants in this session will learn how the city of Redding Public Works Department – Water Utility worked tirelessly to keep the water system operational and pressurized to deliver the water necessary for life safety and fire suppression. Through power outages and a 30% increase in peak daily demand, the water system never failed.

#### 10:30 AM - 11 AM

## Aquifer Storage and Recovery (ASR) in Sonoma County, California

Participants in this session will learn how Sonoma Water (SW) has managed a significant portion of water resources in the county since 1949, including the Russian River, groundwater, and other resources. The Sustainable Groundwater Management Act (SGMA) of 2014 established a specific process for the long-term management of groundwater basins:

• Creation of groundwater sustainability agencies (GSAs) for medium- and high-priority basins by June 30, 2016

• Submittal of groundwater sustainability plans (GSPs) for each basin by January 30, 2022 • Implementation of each GSP during a 20-year period

• Sustainable groundwater conditions by 2042.

Three basins in Sonoma County were originally prioritized as medium priority and are working on complying with SGMA.

Sonoma Water recognized the potential limits on water resources prior to SGMA and initiated a feasibility study in 2010 for a groundwater banking program where Russian River water would be diverted through Sonoma Water's riverbank filtration/treatment system during the wet season and conveyed to depleted aquifers in neighboring groundwater basins for storage and use in the dry season. Groundwater banking projects will likely play a key role for sustaining groundwater resources and complying with SGMA in many basins. Several water purveyors participated in the feasibility study, which identified various methods and favorable locations within the county. The City of Sonoma initiated further work on an ASR pilot test at an inactive well site.

GEI Consultants and Pueblo Water Resources, in coordination with the City and Sonoma Water, installed a test well at the well site to a depth of 230 feet and prepared technical documents in support of a permit application to operate the pilot test. The design of the test well was similar to the design of the nearby supply well. A permit was issued by the California Regional Water Quality Control Board – San Francisco Region and the pilot test began during March 2018.



The City of Sonoma contributed to the success of the pilot test by installing piping, valves, and flow meters from the potable water distribution main to the test well and from the test well to a drainage channel. The City operated the flows of water, treated the recovered water for disinfection byproducts during discharges to the channel, and measured groundwater levels.

Sonoma Water provided much of the financial support for the project and the potable water for the test. Sonoma Water also contributed technical expertise to the permit process and pilot test, including instrumentation of the well for water levels and temperature monitoring with a downhole fiber-optic cable, which enabled high resolution monitoring of water movement within the volcanic aquifer during injection and recovery.

The pilot test was completed during September 2018 and used over four million gallons of water during three cycles of injection, storage, and recovery. Injection and recovery pumping varied between 50 and 80 gallons per minute. Test well water depths varied from approximately 70 feet below ground surface before the test and during the storage phases, 20 feet during the injection phases, and 120 feet during the recovery phases. GEI collected numerous water samples from the water main, test well, and nearby supply well for laboratory analysis of general minerals, nutrients, trace metals, and disinfection byproducts (DBPs). The test well did not experience significant clogging due to the high quality of the Russian River drinking water. The native groundwater and the injection water

could be distinguished by differences in temperature, pH, chloride and sulfate concentrations, and the presence/absence of DBP.

#### 11 AM - 11:30 AM

## Responding to an Extreme Source Water Quality Event – Challenges and Lessons Learned in Clear Lake

The objective of this presentation will be to describe Golden State Water Company's experience with treating surface water in Clear Lake in 2017 where environmental conditions created a two-week extreme event with severely decreased dissolved oxygen and elevated ammonia, iron, and manganese. Lake conditions were so poor for short periods that treating the water was not feasible. This presentation will also describe Golden State Water's staff effort to collect water quality data that confirmed lake conditions, aided in treatment adjustments, and supported procurement of additional capital equipment. The presentation will also describe Golden State Water's experience with working in collaboration with regulators, consultants, the community, and neighboring utilities, during and after the event, as well as long-term efforts with multiple stakeholders to improve the source water quality in Clear Lake.

#### 11:30 AM - 12 PM

## Characterizing Groundwater Quality for SGMA Planning

The Sustainable Groundwater Management Act (SGMA) is largely viewed as a water rights issue however, one of the 6 undesirable results is



"significant and unreasonable degraded water quality." DWR's sustainable management criteria gives generic guidance for identifying undesirable results but does not provide insight towards characterizing water quality of the basin or which constituents should be evaluated. Current guidance largely focuses on plume contaminants which gives the impression that migrating a contaminant plume is the greatest concern in degrading water quality.

This presentation will give insight towards using publicly available data to characterize groundwater and the approach used in the Kern and Kaweah Subbasins. Through the process of drafting Groundwater Sustainability Plans (GSPs) for this region, we found that non-point source contaminants (arsenic, nitrate, and legacy pesticides) are the predominant contaminants of concern in these Subbasins. Specific water quality trends will be presented to demonstrate the correlation between constituent concentrations and water levels, to show how water levels directly influence changing trends. In contrast, some trends show that lowering water levels reduces contaminant concentrations. Trending differences will be discussed with context to well construction, depth of the groundwater basin and aquifer materials (hydrogeology).

Following the groundwater characterization, we'll discuss how the Groundwater Sustainability Agencies (GSAs) used this data to establish

minimum thresholds for degraded water quality; how the contaminants were identified; data that was most valuable in characterizing water quality; and trends that correlate to water levels. There will also be a few examples of how this data is used to establish minimum thresholds and measurable objectives, and what the Kern and Kaweah GSAs constitute as undesirable conditions in their respective Subbasins.

### *Water Quality Analysis* 8 AM - 8:30 AM

#### "History and Evolution of Turbidity Measurement"

Turbidity is a principal physical characteristic of water and is an expression of the optical property that causes light to be scattered and absorbed by particles and molecules rather than transmitted in straight lines through a water sample. It is caused by suspended matter or impurities that interfere with the clarity of the water.

One of the early parameters tested was turbidity. The normal procedure in 1912 used the turbidity standard adopted by the U. S. Geological Survey. A rod with a platinum wire on the end was calibrated by placing graduation marks on the rod, at various distances from the end, and this was lowered into the water as far as the wire could be seen. By 1933 the Jackson candle turbidimeter became the standard. Expressed as JTU (Jackson Turbidity Units). The nephelometric turbidimeter was developed in the 1970's.



Turbidity is measured by directing light of an appropriate wavelength through the sample and detect the intensity at 900 from the incident beam (scattered light). A 900 detection angle is considered to be the least sensitive to variations in particle size.

Turbidimeter design can be categorized into one of two categories, contact or non-contact. In the contact design the sample contacts the optics of the measurement system. In the non-contact design the sample does not contact the optics of the measurement system.

Calibration is required due to the following:

1. Use of tungsten lamp for light source (intensity deteriorates rapidly)

2. The most significant drift results from contaminants fouling the optical elements.

#### 3. Electronic drift

As technology improves the accuracy and reliability have greatly improved and calibration frequency has decreased. Use of laser and LED light sources have improve accuracy and reliability thereby eliminating the first cause for frequent calibration. Turbidimeters employing the non-contact design eliminate the most significant cause for frequent calibration. Thirdly, improvement in electronics has greatly reduced electronic drift, particularly if the incorporates "electronic drift stabilization" in their design.

EPA Method 180.1 states to maintain and calibrate on-line turbidimeters in accordance

with the manufacturers recommendation, and to ensure proper operation they require quarterly verification with a primary standard. If the instrument reading is within  $\pm$  10% of the value of the standard calibration is not required.

The readings indicated by turbidimeters are not scaled in light intensity but in the concentration of a reference suspension. Since the accuracy of the calibration solution determines the accuracy of the turbidity measurements, it is of crucial importance! The international turbidity standard is "formazine" which can be made using Standard Methods.

Zero calibration is essential for low level measurements. The slope of the calibration is pre-defined and stored in the instrument. Calibration is recommended quarterly for accurate measurement by most manufacturers.

New turbidity analyzer focus is on a low maintenance non-contact design where the optics do not contact the sample eliminating fouling and employs a long-life LED light source. This paper discusses contact and non-contact design along with design features eliminating the need to calibrate quarterly.

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#### 9 AM - 9:30 AM

### Total Microcystin Analysis by ELISA

The analysis of Total Microcystin by ELISA is very challenging as there are times that the calibration step fails even if the Lab Analyst is very careful in following the SOP. There are several factors that affect the calibration using the kit's supplied standards. These kit's standards have to be checked using primary standard solutions prepared in the laboratory from an independent source. If the standard calibration curve passes, several check standards are included in the batch and the results should also meet the QC criteria. I will discuss several sources of errors in the ELISA analysis and will also discuss how to prepare independent standard solutions.

#### 10 AM - 10:30 AM

## Slow Progress With Quicksilver: Methylmercury Reduction in Reservoirs Contaminated by Large-Scale Mercury Mining

Participants in this session will learn about the mercury transformations occurring in aquatic ecosystems that regulate the metal's toxicity and bioavailability. He will then detail results of the Santa Clara Valley Water District's 10-year studies aimed to reduce methylmercury concentrations in mining-contaminated reservoirs and fish.

#### 10:30 AM - 11 AM

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#### 11 AM - 11:30 AM

## Sample Integrity - A Guide to Sample Bottles, Preservatives, Hold Times and Collections

During the presentation attendees will learn what does a preservative do? Why do I need specific bottles? What happens if I don't preserve my sample? We'll discuss hold times, what they mean, why they matter and what happens if analysis is performed passed the EPA prescribed hold time. Finally, we'll examine sample collection and help attendees set themselves up for success by following the correct collections protocols and using the correct containers.

What does a preservation do? - As Defined by the EPA: Methods of preservation are relatively limited and are intended generally to (1) retard



biological action, (2) retard hydrolysis of chemical compounds and complexes, (3) reduce volatility of constituents, and (4) reduce absorption effects.

In other words, the purpose of a preservative is to "freeze" the sample chemistry at the point of sampling so that the volume analyzed at the lab is as similar to the source as possible, despite the unavoidable delay between the sampling and analysis.

Why are sample containers different - Sample containers, just like preservatives, are designed to inhibit the natural chemical changes which will occur in a sample as time passes. In addition to that, sample containers also serve a few other purposes:

• To ensure proper volume is provided to a lab (all tests have a minimum required volume)

• To ensure the lab has enough volume to perform the proper quality control

• Some containers limit a samples exposure to UV rays

• Some containers are designed to prevent sample contact with air

• Some are sterilized and sealed to prevent bacteria contamination

• Some containers are designed to limit sample absorption (plastic vs. glass)

• Some are specifically designed to be loaded directly into an instrument (or even an autosampler for composite samples)

What is an analytical holding time, and why does it affect me? - A "holding time" is the elapsed amount of time from the point of collection to the moment of preparation or analysis. If samples are analyzed beyond an analytical holding time, the data will be qualified on the analytical report.

Sample Collection is the first, and perhaps the most important step in the analytical process. Poor sampling inhibits the labs ability to produce representative data of a sampling source. Sampling is comprised of 5 main steps:

1. Create a Field Sampling Plan

2. Contact lab to order bottle kit and iron out any scheduling complications

3. Conduct sampling following instructions from Field Sampling Plan and the lab

4. Releasing Custody of Samples to the lab, or a third party shipper

5. Review Sample Receipt to ensure you're on the same page as your laboratory

The full presentation is available upon request.

## *Engineering & Construction* 8 AM - 8:30 AM

## How Can Hydraulic Models Solve Operational and Design Challenges in Water Distribution Systems?

Participants in this session will learn of several case studies where a water distribution system hydraulic model was successfully used to





March 25-28, 2019 & Sheraton Grand & Convention Center & Sacramento, CA

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address various operational and design challenges.

### 8:30 AM - 9 AM

## Canal Replacement Project -Innovate Approaches to Unique Challenges

Participants in this session will learn about the challenges and innovate design approaches applied to the Canal Replacement Project to install a 10-foot diameter concrete pipe with the presence of high salinity groundwater and multiple creek/drainage crossings, the use of soil cement to reduce imported bedding and other design approaches will also be described.

#### 9 AM - 9:30 AM

## Fastest Ever Aquifer Storage and Recovery Project - City of Woodland ASR Project

Participants in this session will learn about a creative water supply approach that can provide a solution to many common challenges utilities in California and Nevada are currently dealing with.

9:30 AM - 10 AM BREAK

#### 10 AM - 10:30 AM

## Stopping "Hammer Time" – A Unique Hydraulic Model Calibration Story to Evaluate Hydraulic Transient Events

Participants in this session will learn about a detailed and operationally focused hydraulic

model calibration and data collection effort to refine model use for operations and transient evaluations.

10:30 AM - 11 AM

## An integrated approach toward groundwater banking in the southern Central Valley, California Participants in this session will learn how regional Ag-MAR projects can influence stream

flows and surface diversions using an integrated - management model

## **11 AM - 11:30 AM** Start With the End in Mind -Designing Ductile Iron Pipe for Seismic Survivability

Participants in this session will learn what design parameters that should be considered when designing for seismic pipelines.

## 11:30 AM - 12 PM

## What keeps you up at night?

Participants in this session will learn about a strategic approach to evaluating risk from inaccessible piping networks within your distribution system.



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### Asset Management Committee, Water Management & Efficiency Committee, Water Transmission Systems

#### 8 AM - 8:30 AM

## California's New Water Efficiency Laws: Keep Calm and Comply (with our help!)

Participants in this session will learn what California's new water efficiency laws will mean for water providers along with the latest updates on the new regulations straight from the source. Participants will also explore tools and resources available to help them implement these new regulations and comply.

#### Water Management & Efficiency 8:30 AM - 9 AM

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9:30 AM - 10 AM BREAK

#### 10 AM - 10:30 AM

## Looking to the Past to Guide the Future: Strategic Planning for Water Use Efficiency

Participants in this session will learn how West Basin, a southern California wholesale water agency, is approaching strategic planning to transition its Water Use Efficiency program into the Making Water Conservation a California Way of Life era.

#### 10:30 AM - 11 AM

## We're in the Money: Scaling up Investments in Distributed Water Innovations

Participants in this session will learn how water efficiency tech, reuse systems, green infrastructure, and other "distributed infrastructure" are helping cities across the West address water supply, quality and stormwater management challenges. Attendees will gain understanding of an innovative new opportunity for financing distributed systems at scale in their own communities.



March 25-28, 2019 & Sheraton Grand & Convention Center & Sacramento, CA

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#### 11 AM - 11:30 AM

Self-Service Solutions – Improving Satisfaction and Saving Staff Time with AMI Data

The attendees in this session will be informed on how they can get their customers to engage with the utility for a working relationship in understanding their water bills.