

Presentation Title	Main Presenter Name	Presenter Organization	Presentation Summary
Track 1 - Wastewater Treatment			
Advanced Electro-Oxidation, Destroying a Wide-Range of Contaminants in All Types of Wastewater	Nicole Bolea	Xogen Technologies, Inc.	Xogen is the cutting-edge provider of Advanced Electro Oxidation technology to treat wastewater onsite to destroy ammonia and other contaminants. We will be presenting in conjunction with the WINSS UMass, Amherst folks on new data and findings.2
Assessing the Ecotoxicological Effects of Coronavirus Countermeasures on WRRF Performance	Bryan Coday	Carollo Engineers	Widespread disinfectant and antiviral drug usage during a pandemic response can have a direct impact on WRRFs and presents a potentially significant ecotoxicological challenge to wastewater microbiology. This presentation summarizes the current state of scientific knowledge and lessons learned related to coronavirus impacts on WRRFs, including a synopsis of full-scale operating data from local utilities.
Case study of Mid-Size WWTP Solids Treatment Mass, energy, and Nutrient balance	Zach Mazur	Centrisys-CNP	This presentation will cover the reduction in volume and nutrients at each stage of the plant as well as map out the energy balance and the potential for energy recovery.
Considerations for Implementing Colorado's first granular activated sludge (AGS) facility.	Michael Katalinich	JVA Inc	This paper/presentation will present a case study of the Construction Manager at Risk (CMAR) project and focus on the challenges of implementing Colorado's first AGS facility while maintaining daily operations and meeting discharge permit requirements. A significant portion of this paper will discuss the critical sequencing plans for construction activities, key tie-ins, start-up, and switching over to a new process during peak flows for facility approaching permitted capacity.
CVWRF Case Study: West Side Process	Adam Klein	Brown and Caldwell	A case study summarizing a multi-year effort to transition a large wastewater treatment facility to meet nutrient regulations. Includes discussion of technology development, lab and pilot scale testing, and cost considerations.
Decoupling Aeration from Mixing Achieves Up To 70% Energy Savings in Aerobic Digestion	David Lauer	EnviroMix, Inc.	Decoupling aeration from mixing provides significant energy savings in aerobic digestion. Process controls through instrumentation feedback of DO and ORP, reduces nutrients in supernatant recycle side streams.
Design and Lessons Learned from 1,2,3-Trichloropropane Groundwater Remediation with Granular Activated Carbon	Carol Martinson, PE	Trihydro Corporation	Regional groundwater impacts have been identified in the United States related to the release of agricultural chemicals, including 1,2,3-trichloropropane (1,2,3-TCP), an emerging contaminant. This case study focuses on the remedial process completed to address low-level concentrations of 1,2,3-TCP in groundwater below a former agricultural facility, including the remedial alternatives evaluation, remedy selection, bench-scale pilot testing, full-scale implementation, system optimization, and lessons learned for a large, dilute 1,2,3-TCP plume.
Don't Get Wasted: Recycling Industry Residuals for Water Treatment	Anthony Kennedy	US Bureau of Reclamation	This work involved two case studies where waste materials from different industries were proven effective as water treatment technologies. One was the use of bone char for the removal of fluoride from groundwater and the other was the use of steel slag for heavy metal removal from mine drainage water.
Evaluation of factors affecting Dissolved Oxygen (DO) concentration in treated wastewater	Ram Anirudh Kuchibhotla	Tetra Tech	A wastewater treatment plant at a confidential client's facility treats wastewater generated from the manufacturing operations on site. The treated effluent was not meeting the Dissolved Oxygen limits, even with aeration prior to discharge. Plant operations were reviewed, and treatability tests were designed to investigate the issue.
From Theory to Practice: A year of hydrocyclone-based wasting	Erin Tracy	Brown and Caldwell	This data-driven evaluation discusses the impacts of a year of hydrocyclone-based wasting at the City of Pueblo Water Reclamation Facility. The evaluation includes settling performance, nutrient removal performance, biological changes, and operations and maintenance considerations.
GAC or IX? Media Selection for PFAS Treatment	Stephen Timko	Kennedy Jenks Consultants	Two technologies have emerged as the preferred treatment methods for PFAS removal: granular active carbon (GAC) and single-pass ion exchange (IX). This presentation will review case studies of four treatment facilities to discuss the media selection process for PFAS treatment.
Getting the Salt Out -Converting an SBR to MBR Followed by RO for TDS Reduction	Andrew Waddoups	Burns & McDonnell Engineering	Converting an SBR to an MBR followed by RO for TDS reduction. How advanced treatment processes can be used to efficiently treat wastewater to ground water standards.
Navigating low effluent phosphorus limits: "Right sizing" phosphorus reduction strategies through uncertainty-based evaluations.	Colin Fitzgerald	Jacobs	Management of risk, as compared to risk avoidance, through implementing uncertainty-based approaches is one method that can be utilized to optimize nutrient reduction strategies. This presentation will provide background on uncertainty-based methods and utilize two case studies to demonstrate the impact of utilizing an uncertainty-based method on phosphorus reduction strategies.
Perfluoroalkyl Substances (PFAS): Challenges and Opportunities in Water Treatment	Mitchell Olson, PhD, PE	Trihydro Corporation	PFAS are a class of emerging contaminants that are pervasive in our society and which have challenged our understanding of water treatment through their unprecedented combination of persistence and mobility. This presentation includes an overview of PFAS compounds including PFAS chemistry, overview of the challenges presented by PFAS, best available practices for PFAS treatment in water streams, and review of the state-of-the-science for emerging PFAS treatment approaches.

Presentations at a Glance (Draft-Subject to Change)

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Saving Energy and Money through Better Wastewater Treatment Plant Mixing	Michele Braas	Xylem Inc.	This presentation will be valuable to the listeners because it will provide them with general knowledge on mixers as well as actual practices that they will be able to take back to their facilities. After the presentation they will be able to observe the mixers in their facility to determine if they are optimally positioned as well as if the mixers are overmixing and thus wasting energy and perhaps hindering treatment.
Selector Design – Rule of Thumb or Engineered?	Tye Jordan	Murraysmith	This presentation is developed from selector designs performed by Murraysmith for the Cities of Pasco and Richland's wastewater treatment facilities (WWTFs). Each WWTF is implementing the Modified Ludszack-Ettinger (MLE) process configuration. The selector volume resulting from each step of the design approach will be discussed and compared, as well as any potential implications for anoxic selector design assumptions and engineering approaches.
Specificity is Key: How We're Creating Our Very Own Nutrient Model	Erin Jenkins	South Platte Water Renewal Partners	The South Platte Water Renewal Partners (SPWRP) will discuss the development (data input and calibration) of a nutrient model to investigate multiple management scenarios related to regulatory and process decisions. Segment 14 of the South Platte River will be modeled using the QUAL2kw framework, with the application of Microsoft PowerBI for data cleaning and mining.
Spending Less to Get More: WWTP Optimization Improvements	Craig Anderson	Murraysmith	This presentation will discuss and demonstrate the success of three low capital cost methods of quickly improving wastewater treatment plant operation and capacity for the City of Pasco. Refinements made to cut the associated annual chemical costs by as much as 50% will also be presented.
Sustainable Solution for Grit Management Solves Plant Maintenance Challenges	Patrick Herrick	Hydro International	The need for a highly efficient system with a small footprint lead the City to implement a sustainable grit removal system proven to capture fine and slow settling grit. By characterizing influent grit distribution, a target particle size was selected and then the installed system was verified by an independent third party to achieve the desired removal efficiency.
The Secret of Low Effluent TN in Cold Climate BNR Facilities: SNDN or Nitrous Oxide Emission?	Natalie Beach	Carollo Engineers	This presentation examines the factors that result in effluent nitrogen and phosphorus concentrations that approach Regulation 31 standards at conventional BNR facilities under cold weather operation in the Rocky Mountain Region.
The Selection of Advanced Biological Nutrient Recovery (ABNRTM) for Phosphorus Compliance at Two Wisconsin Facilities	Jordan Lind	CLEARAS Water Recovery	Extensive piloting, process optimization and facility modifications to meet future low-level phosphorus permit requirements have been researched by the Village of Roberts and Waupun Utilities, each located in Wisconsin. Chemical dosing, ultra-filtration and Advanced Biological Nutrient Recovery (ABNR) were among the pilots conducted at each facility.
The silent thief. How influent metals can impact BioP and reduce nutrient recovery potentials.	Colin Fitzgerald	Jacobs	Metals present in the influent of WRRFs are often uncharacterized and not considered; these influent metals loads have the potential to impact biological phosphorus removal and nutrient recovery. This presentation will summarize potential impacts both at a conceptual level and utilizing a full-scale case study.
Things that make you go hmm?! Lessons learned when upgrading the 30 year old 3 mgd City of Durango Santa Rita WRF to biological nutrient removal.	Patrick Radabaugh	Dewberry	The impacts to the staff and management are often understated when a facility undergoes major improvements. This presentation is a summary of the lessons learned by the Project Team (Operations, Management, and Design Engineer) while the BNR process was coming online.
To ABAC and beyond: Integrating advanced controls to optimize performance and resource utilization	Heather Stewart	Jacobs	Wastewater utilities are being faced with increasingly stringent nutrient regulations while also trying to increase energy efficiency. Integration of advanced controls strategies at water resource recovery facilities (WRRFs) can be implemented to increase efficiency without sacrificing performance reliability.
Utilizing a Ceramic Membrane Bioreactor to Reduce Treatment Tankage Volume Requirement for Taos Ski Valley WWTP Expansion	Mark Dahm	Plummer Associates, Inc.	Ceramic Membrane Bioreactor Utilization Reduces the Required Treatment Tankage Volume of Ski Valley WWTP Expansion. Ceramic MBR membranes allow using high flux rates and high MLSS concentration process operating conditions reducing constructed cost substantially and reducing the construction timeframe by approximately 9 months.
Yes Aerobic Digesters Can Have Significant Nutrient Recycle Streams!	Michael Syverson	Dewberry	Facilities with aerobic digesters typically do not dewater biosolids everyday but instead dewater every other or every three days and many of these aerobic digesters turn off the air to the digesters when they are drawing off solids for dewatering. Consequently, phosphorus ends up being released which can result in 50 or more percent increase in phosphorus load to the secondary process if not properly managed.
Julesburg: Agile, Adaptable Plan for Wastewater Treatment Facilities Improvements	Jose Velazquez	Lamp Rynearson	While compliance with stringent discharge limits is a challenge, it is important to understand the integrated nature of the wastewater discharge permitting process and to maintain the ability to adapt recommended solutions to changes in the requirements and unexpected challenges. Julesburg was able to adapt and update alternatives analyses to meet unanticipated regulatory requirements quickly, and as cost-effectively as possible.

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Track 2 - Drinking Water			
A Comprehensive Tracer Analysis at a Conventional 40 mgd WTP	Jarod Limke	HDR	Following the recent plant upgrades, the City undertook an extensive tracer study to validate disinfection contact time throughout the plant. Testing was performed under a large range of operational scenarios, provided unexpected lessons, and served as a valuable resource for the City.
A Digital Twin Model for Cyanotoxin Removal at Drinking Water Treatment Plants	Benjamin Stanford	143 Union Blvd	This presentation will focus on providing an overview of the newest version of CyanoTOX (3.0), treatment strategies, and demonstration of case studies to show how the tool can be applied at facilities around the US. The tool provides water utilities with a means to assess how changes in their existing treatment scheme from hydraulics, to disinfection, to activated carbon, and standard filtration will influence the degradation and removal of specific cyanotoxins or groups of cyanotoxins.
Assessing Capture Zones for Albuquerque Wells	Steve Shultz	Hazen and Sawyer	The Albuquerque Bernalillo County Water Utility Authority used multiple approaches to assess capture zones to their wells. In this presentation, we compare and contrast the different particle tracking approaches used to describe the pathways to deep, production well screens in a dynamic aquifer system.
Assessing the risk exposure for select health outcomes of enteroviruses through C. Perfringens enumeration	Florian Kleinhoven	Newcastle University	Quantitative assessments through enumeration of C. perfringens indicator organisms may be used to measure the extent of faecal-oral contamination in water sources of Hepatitis A virus. Analytical data of C. perfringens to enteroviridae ratios may inform vaccination programs to control and prevent enteroviral endemicity including Hepatitis A.
Autonomous RO/NF Desalination by Solar Powered Energy on Rural Tribal Lands	Cheyenne Footracer	Colorado School of Mines	A closed-circuit reverse osmosis (RO) and nanofiltration (NF) system provides successful water recovery of 95-97% for impaired brackish water on the Navajo Reservation. Because the reservation (as well as other small, remote communities) lack adequate energy infrastructure, the RO/NF system is powered by solar energy to overcome this obstacle.
Bromide: the hidden precursor to disinfection byproducts.	Kelly Fearney	Plummer	Bromide in Colorado groundwater has been found at concentrations ten times higher than the national average and while bromide itself is unregulated, it significantly impacts the formation of disinfection byproducts (DBPs). Bromide and additional brominated disinfection byproducts are currently being monitored by the EPA under Unregulated Contaminant Monitoring Rule (UCMR 4), which could result in future regulation.
Disinfection Byproduct Precursors Compliance Tools	Jerry Duncan	Colorado Springs Utilities	After violating CDPHE's Disinfection Byproduct Precursors Rule in 2016, Colorado Springs Utilities has developed a suite of tools and projections designed to encourage operations staff to be mindful of TOC averages and trends and to be vigilant of sudden changes in source water quality that may endanger the water treatment plant's compliance.
Everything You Need to Know About Filter Surveillance – Basics, Best Practices, and Results	Ben Murphy	Carollo Engineers	This presentation includes a broad overview of the testing methods and analytical procedures of a filter surveillance program, best practice recommendations from the City of Aurora's filter surveillance program at their three Partnership for Safe Water Phase IV facilities, and specific results from filter testing conducted at the City of Santa Fe's Canyon Road Water Treatment Plant. Successful implementation of a filter surveillance program results in more efficient plant operation and improved finished water quality.
GAC or IX? Media Selection for PFAS Treatment	Stephen Timko	Kennedy Jenks Consultants	Two technologies have emerged as the preferred treatment methods for PFAS removal: granular active carbon (GAC) and single-pass ion exchange (IX). This presentation will review case studies of four treatment facilities to discuss the media selection process for PFAS treatment.
Groundwater Treatment of Fluoride, Arsenic and Hexchrome using Activated Alumina and Iron Oxide Media.	Stephen Timko	Kennedy Jenks Consultants	Bench and pilot studies were conducted on groundwater containing arsenic, fluoride, and hexchrome using two treatment media, activated alumina and iron oxide. Activated alumina media was determined to be the most suitable for treatment of the groundwater, and optimal operating conditions were established.
IMA 65 Filter Media: An Effective Tool for Iron and Manganese Removal from Groundwater Supply	xuehua Bai	Bai Engineers	IMA 65 media can help small system to cost-effectively remove iron and manganese. The benefits of using the IMA 65 are two folds: reduced the floor space due to the filtration rate of up to 15 gallon per minute per square foot; ease of operation because of the switch-over from the potassium permanganate to sodium hypochlorite.
Insights from 25 years of pilot testing	Laurie Sullivan	Brown and Caldwell	This presentation will discuss the elements of planning for a pilot study that will contribute to its successful execution.
Iron and Organics - A Foul Combination: Coagulant Transition to Improve Operations at a 50-mgd Membrane Plant	William Sarchet	Carollo Engineers	Membrane fouling at the 50-mgd Wes Brown WTP, identified primarily as iron and organics, has resulted in operational challenges including lower membrane permeability, reduced membrane capacity, and decreased membrane useful life. This presentation will review the findings and lessons learned from transitioning primary coagulants from ferric chloride to aluminum chlorohydrate as part of a year-long full-scale evaluation, covering such subjects as impacts to membrane permeability, recovery clean effectiveness, and reversible versus irreversible fouling for different aged membrane trains.

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Light at the End of the Tunnel: Squeezing in Direct Organism UV Inactivation at the Entrance to a Century-Old 108" Tunnel	Andrew Hart	Carollo Engineers	Rising THM's prompted the East Bay Municipal Utility District to move away from raw water chlorination and install a below-grade UV and free chlorine disinfection facility at the 200-mgd gravity/flow-through Orinda Water Treatment Plant, first constructed in 1933 along with the adjacent Claremont Tunnel. This paper will cover several of the most unique design challenges and solutions, including the constrained hydraulics and construction footprint, an unusual chemical mixing system, and the extensive use of virtual reality to enhance creativity and collaboration between the owner and the design team throughout the process.
Make it LAS: Improve Operational Safety Using Liquid Ammonium Sulfate	Haley Morton	Burns & McDonnell	Converting existing aqueous ammonia systems to liquid ammonium sulfate can improve operator safety will still achieving treatment goals. This session will cover the benefits of converting to LAS and present a case study of three different water treatment plants and the factors driving their conversion to LAS.
Manganese Reconsidered: Aesthetic Concern or Public Health Risk?	Phil Brandhuber	Phil B Water	In the future utilities may need to transition from viewing Mn as purely an aesthetic issue to an issue of public health protection
Optimizing Pellet Softening for Hardness Removal in Groundwater Sources and RO Brine: A Local Case Study	Katie Hicks	Brown and Caldwell	In order to significantly remove hardness, the City of Brighton and Brown and Caldwell have pilot tested pellet softening. Two scenarios have been considered; the reduction of hardness in two groundwater sources and the reduction of hardness in RO brine for the purpose of re-blending with RO permeate.
Perfluoroalkyl Substances (PFAS): Challenges and Opportunities in Water Treatment	Mitchell Olson, PhD, PE	Trihydro Corporation	PFAS are a class of emerging contaminants that are pervasive in our society and which have challenged our understanding of water treatment through their unprecedented combination of persistence and mobility. This presentation includes an overview of PFAS compounds including PFAS chemistry, overview of the challenges presented by PFAS, best available practices for PFAS treatment in water streams, and review of the state-of-the-science for emerging PFAS treatment approaches.
Reading the tea leaves - City of Craig Immersion testing to help predict whether a chloramines conversion would cause a lead problem	Tyson Ingels	State of Colorado - CDPHE	Learn how the City of Craig and CDPHE partnered to execute immersion testing to ensure the conversion to chloramines would not cause lead release. Immersion testing may be right for your utility to test up-coming changes to sources or treatment.
Recommendations for Monitoring of Legionella pneumophila in Drinking Water Distribution Systems	Mark LeChevallier	Dr. Water Consulting, LLC	Water utilities can implement a monitoring program to reduce the occurrence and risk of Legionnaires' disease in their distribution system. Guidance is available to help utilities develop a proactive voluntary monitoring program.
RO Permeate and Corrosion Control: For Municipal RO Applications the Complications Don't End with Brine Disposal	Julian Paiz	Plummer	Enhanced recovery and brine disposal get a lot of attention in the world of reverse osmosis membrane technology. This work presents a look at the less discussed aspect of RO permeate stabilization and remineralization using a modern calcite contactor design.
Suppression of Harmful Algae Blooms (HAB) in Drinking Water Reservoirs	David Austin	Jacobs Engineering Group	Suppression of harmful algae blooms (HAB) in drinking water reservoirs is a common and growing concern for utilities worldwide and effects of HAB include risk of cyanotoxin exposure, formation of taste and odor compounds, and operational impacts to water treatment plants. This presentation will provide theory and results from several projects in the US using pure oxygen, aeration, and geochemical augmentation.
Taste and Odor Problems? Learn how Thornton is Solving Their Earthy Water	Emily Huth	Burns & McDonnell	The new Thornton Water Treatment Plant is utilizing ozone oxidation and biofiltration for removal of MIB and geosmin from one of its raw water sources. The facility design, piloting data, and T&O removal data from the newly commissioned treatment plant will be presented.
The Future Has Arrived: Successful Application of Digital Twins for Process Decision Making	Hilary Feier	Jacobs	Plant flow fluctuations and filter flow control and backwash sequencing are common areas for process improvement at water treatment plants around the country and the West. This presentation will show two examples of how digital twins were used to inform improvements to existing water treatment plants by combining plant data with a hydraulics and controls model to facilitate communication, hypothesis testing, and decision making.
The Pressure of T&O Complaints and High PAC Doses Created a Diamond in the Rough – Biological Roughing Filters	Vincent Hart	Carollo Engineers, Inc	Biological filtration has gotten a lot of traction on the Front Range and has been traditionally used after conventional floc/sed as a part of the filtration step. This presentation will review the concept of biological roughing filters, how they work, the amount of taste and odor compound removal, and the important design criteria including reduction of fouling on downstream membranes.
Using water quality parameters for feed forward control of coagulant dose to provide confidence in water treatment	Wade McCaulley	Eagle River Water and Sanitation	A central Colorado surface water treatment plant utilized historical daily water quality data from 2015 and 2016 to create a feed forward coagulation control empirical model for primary coagulant dose adjustment. This has resulted in an increase in the plant's net production efficiency and improved operator confidence with adjusting primary coagulant dose during challenging water quality events.
Would YOU Drink It? Improving Taste and Odor to Build Customer Confidence!	Benjamin Shriber	Kennedy Jenks Consultants	Participants in this session will learn about taste and odor issues in drinking water systems. This presentation will explain why taste and odor is important for public acceptance, causes of taste and odor, and how to mitigate taste and odor issues at the source, in a water treatment plant and in the distribution system.

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Track 3 - Utility Management / Planning			
"The wind stole my plan set!": Avoiding Field Data Collection Mishaps with Google Earth and Collector for ArcGIS	Madeleine Harris	HDR	This presentation will describe technology and applications, such as Google Earth and Collector for ArcGIS, that can be used to aid in field data collection for various types of projects. The presentation will also go through case studies of projects these tools have been used on, some advantages and lessons learned using these tools, and an overall summary of implementing technology into a typical field visit.
A digital environment developed to protect the water environment	Jacob Young	Brown and Caldwell	Advancements in technology allow water utilities to develop integrated digital environments that empower their stewardship over the water environment. This presentation highlights how the Central Valley Water Reclamation Facility (CVWRF) Smart Utility environment made it possible for them to: 1) quantify energy cost savings from new pump operations, 2) identify up to \$180k/yr energy savings in UV disinfection, 3) identify needed corrective actions on sensor calibrations.
Asset Management; a culture of reliability first and engineering function second	Gerald Fejarang	Kennedy Jenks	Reliability is a methodology born out the airline industry in the 1950"s and is the soul of reliability programs in other asset intensive industries, like water and wastewater. Attendees of this presentation will learn about the challenges faced when implementing and sustaining an AM Program, how to prioritize a culture of reliability as a utility or agency, and what it means to practice an AM methodology centered on O&M.
Audit Tips and Tricks	Sherry Scaggiari	City of Aurora	Whether you are in water treatment, wastewater treatment or the laboratory you are subject to audits. Audits should be used as a tool to learn where you have opportunities to improve as well as know what you are doing right. Explore how to be prepared for, conduct and follow up on audits of all types. Learn how to train your team for an audit.
Building Trust to Sustain Success	Marianne Langridge	Sustainable Synthesis Limited	Technology projects have great potential value for utility sustainability yet often come with fear and risk. This session will present case studies with techniques to reduce risk by creating a productive environment that enables project success.
Communication & Outreach Through A Crisis – Lessons Learned & True Stories	Tara Bettale	HDR Engineering, Inc.	HDR's strategic communication managers will unearth their lessons learned and best practices for internal and external communications during COVID-19 and how utilities can prepare for the next crisis (big or small) in their communities. Also, a panel of local utility communicators and operators will share their stories of communication to staff, the public and elected officials/decision makers during this pandemic and advice on how to handle the next one.
Decision Support Systems in Water Resources: Using Live Drought Exercises to Improve Water Management	Casey Caldwell	Hazen and Sawyer	The presentation will detail a case study of SUEZ Water in Northern New Jersey using drought exercises to help develop and implement dynamic operating rules for its reservoir system. This collaborative risk management approach is changing the paradigm of drought management, and the experience of SUEZ can provide a template for other utilities, both large and small, that seek to make their water supply operations more resilient and cost-effective.
Denver Water's Safety Maturity Index: Understanding Safety Climate, Leadership and Operational Risk	Josh Kreger	Denver Water	Denver Water has identified safety culture as a key mechanism limiting enterprise safety efficacy beyond tracking negative safety data as means of understanding operational risk. In response, the organization designed and developed a unique Safety Maturity Index (SMI) that identifies a holistic, evidence-based view of safety data to leverage and control operational risk.
Distribution / Collection or Management / Planning -- A Deep Subject for a Shallow Mind (Wells and Pumps as seen from a Wet Behind the Ears Contractor turned Professional Consulting Engineer, then back to an Old Professional Contractor)	Tom Dea	Colorado Water Well	Water supply wells and pump equipment operational history viewed from different perspectives from 1985 - 2020. Be curious about changes that have happened and be curious about the changes that will happen - with or without you being on board.
Dynamic Asset Management and Capital Planning – Emerging from Stagnation	Diane Roher	Hazen and Sawyer	Asset management plans (AMPs) are valuable tools for realizing organizational objectives and capital programs. The dynamic integration of data and dashboard visualizations enable AMPs to remain pertinent and valuable past completion.
Ethics, Values, and Leadership for Water Leaders	Dennis Gatlin	Boxelder Sanitation District	Learn the key roles your values and leadership play in managing ethical dilemmas. This practical, interactive session prepares you for strategic and everyday challenges working in the water industry
Leveraging CMAR Delivery to Maximize Scope and Cost Certainty	Jason Rysavy	Jacobs	The South Fort Collins Sanitation District (SFCSD) utilized a Construction Manager at Risk (CMAR) project delivery approach for a \$35 million-dollar capital improvements project at its Water Reclamation Facility (WRF). This presentation will discuss how SFCSD utilized this delivery approach to maintaining the project's construction cost while maximizing the project's scope.
Looks like Fort Collins is Going to be Out of Water? You Want to Put a Temporary Pump Station on Private Property...with Cows Around? Stakeholder Management Strategies During times of Limited Water Supply	Nina Khanzadeh	HDR Inc	The City of Fort Collins and the neighboring Tri-Districts in Colorado are at risk of not having a reliable water source in Fall 2020. HDR and the City of Fort Collins worked together to develop a reliable stakeholder management strategy to develop a reliable and cost effective water supply project under intense scheduling constraints.

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Mesa Verde Community Water Systems	Kenneth Wright	Wright Water Engineers, Inc	The evaluation of four reservoirs and one cistern at Mesa Verde National Park uncovered much about the knowledge, skills, and history of the early people of Mesa Verde. The Ancestral Pueblo people of Mesa Verde were successful water harvesters and reservoir builders under difficult conditions because they were good engineers with innate technical knowledge.
More than a paperweight: Going Digital with Denver's Stormwater Master Plan	Wilson Wheeler	HDR Inc	The City & County of Denver's innovative GIS-based approach to storm drainage master planning resulted in a more accurate assessment of the collection system. It also created a strategic communication platform to reach a broader audience with varying levels of technical interest, including internal stakeholders and the general public.
OMAR – Meditating on Long-Term Operations	Elizabeth Minyard, CRL	Brown and Caldwell	Operations and Maintenance (O&M) for water and wastewater projects can represent fifty percent (50%) or more of a project's lifecycle cost; however, obtaining long-term O&M performance commitments is a fundamental challenge within traditional and DBO delivery models. A new model, Operations and Maintenance At-Risk (OMAR), in conjunction with DB or traditional delivery, takes on the risk of performance with a corresponding interest and contribution early in the design and construction to influence how that long-term performance commitment plays out.
Pandemic! Panel on Lessons Learned from COVID-19	Victor Sam	Stantec	The water and wastewater industry is crucial component of hygiene and sanitation in the fight against the spread of COVID-19. This presentation will involve a panel of various utilities and engineers in both water and wastewater to discuss lessons learned in response to the global pandemic.
Planning for the Future, What to do when the Future Keeps Changing	Sarah Dominick	Hazen and Sawyer	Water utilities must frame long-term decisions using a time horizon that includes significant uncertainty. To mitigate uncertainty, municipalities across the West have implemented adaptive strategies that use triggering events to guide action.
Rate Surveys in the Rocky Mountain (how to really do an apples to apples comparison)	Fernando Aranda	Aurora Water	How to do rate surveys that are correct and account for the complexities of the different rate structures that can be found in the Rocky Mountain region
Show Me the Money - Source Water Protection Funding through the Farm Bill	Sarah Dominick	Hazen and Sawyer	In 2018 AWWA worked with the USDA and Congress to increase the opportunities available to use agricultural conservation programs to advance source water protection goals. The first round of funding has been completed and this presentation will discuss future funding opportunities.
The CMaR Delivery Method- Facts, Myths, and Everything in Between	William Canterbury	Canterbury Construction Ma	CMaR is a very powerful project delivery method when properly utilized. While there are many differing opinions around what constitutes a proper CMaR project delivery, this presentation will provide the basic guidelines for delivering a successful CMaR project.
Understanding and Measuring Affordability and Effectively Targeting At-Risk Households	Janet Clements	Corona Environmental Cons	This presentation will present the range of metrics and methods for assessing affordability at the household level. A key objective will be to understand how to use the data from affordability assessments to effectively target at-risk customers in need of assistance.
Unmanned Vehicles Drive Safety, Efficiency, and Quality in Condition Assessment	Nick Worley	Brown and Caldwell	Unmanned aerial, surface, and submersible vehicles, coupled with new data visualization techniques to improve data utilization, are helping to provide utilities with the critical condition assessment information they need to strategically rehab their facilities and stretch their dollars further. This presentation will review case studies and demonstrate how these vehicles can augment, improve, or reduce traditional manned inspection methods.
Upgrading a City's Entire Plant Network System Allows Them to Operate Together Risk-free	Tricia Quigley	HDR	A creative and flexible solution to aging water infrastructure. This approach allows for future growth and infrastructure for the next 100 years.
Sticking Together Like Peanut Butter!! A Case Study Demonstrating how a Progressive Design Build Team Overcame Challenges of Dewatering Water Treatment Residuals at the Town of Erie Lynn Morgan Water Treatment Facility	Michael Katalinich	JVA Inc	How to troubleshoot performance issues between several pieces of water residuals dewatering equipment . How to stick together between engineers, manufacturers and their representatives, and owners to produce a successful project
Leadership Surprises! – What You Didn't Expect, Transition from Individual Contributor to Manager	Jamie Langer	South Platte Renew	How can we prepare the next generation of leaders, supervisors, and managers to navigate the change from individual contributor to manager? This session, organized by the Rocky Mountain Water Young Professionals, the local Young Professionals member association of American Water Works Association (AWWA) and Water Environment Federation (WEF), focuses on how we can learn from industry professional's experiences regarding the unexpected challenges that come with moving up to management.

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Leadership in Times of Change	Richard Gerstberger	Tap Resource Development	Leadership in today's organizations require an understanding of the environment the organization operates within, its purpose or mission, and the core competencies needed to accomplish that mission. When a crisis arises, it is usually from within one or more of those areas. As organizations struggle with crisis, leaders have a choice. They often either avoid the issue, struggle, or panic. However, what is needed for the wellbeing of the organization is that leaders direct the very best of themselves to identifying how to lead in ways that move their organizations through these times of turmoil, through crisis large or small.
Track 4 - Distribution / Collection			
2020 Second Edition of AWWA M55 HDPE Pipe	Amster Howard	(blank)	Understand about the new chapters and information in M55 manual
Automation in Collection System Planning – Seattle's Wastewater System Analysis	Rizwan Hamid	Murraysmith	System-wide H/H modeling is an extremely data-intensive process, especially when evaluating multiple scenarios. Automation of repetitive tasks is beneficial to the project by eliminating redundancies and delivering high quality products.
Corrosion - Best Practices to Prevent and Manage this Uninvited Guest	Sean Lammerts	US Pipe	As we strive to improve our water systems and leave them in a better condition than we found them, questions inevitably arise concerning how to protect metallic pipelines from corrosion. This presentation will cover the fundamentals of corrosion, tools available to prevent corrosion, a summary of the last 12 years of test data on the leading pipeline protection methods.
Developing a Unidirectional Flushing for a Mid-Sized Mountain Town	Jason Coontz	AECOM	Using the targeted approach of unidirectional flushing (UDF), municipalities can increase the flushing velocities and pipe scouring to remove more contaminants and sediment from water distribution piping while using less water than conventional multidirectional flushing. Using a mid-sized mountain town municipality as an example, this presentation will go over the approach to create a UDF program, including data review, developing flushing criteria, the pros and cons of using hydraulic modeling software to develop flushing sequences, and lessons learned from preliminary flushing conducted with the UDF program.
Distribution System Water Quality Improvements with Implementation of Active Tank Mixing	Jeff Rhodes	UGSI Solutions	Active mixing in drinking water storage tanks has become a proven tool for improving water quality in potable water distribution systems. By ensuring water chemistry homogeneity, properly sized active mixing can reduce disinfectant residual loss, water age, prevent tank icing and, when combined with active ventilation or aeration, remove THMs from finished water.
Eyes on your Sewer Collection System: A Cost-effective Method	xuehua Bai	Bai Engineers	Using SmartCover System for the cost-effective sewer flow data collection. The benefits are two folds: real-time flow monitoring for sewer collection system operations and reliable data source for sewer modelers.
Fast-track Water Distribution Pipeline Design Using a GIS Database	Mandy Rasmussen	JVA, Inc.	Best management practices and suggestions for using information from an existing GIS database concurrent to performing a topographic survey to establish a horizontal alignment and complete a preliminary pipeline design. This joint presentation by JVA and King Surveyors will be a summary of how the GIS database maintained by the Town of Estes Park was useful in meeting an aggressive schedule for completing the preliminary design of a 30,000 LF pipeline project.
Gunnison, CO: I&I Reduction Using Collection System GIS Mapping & Hydraulic Modeling	Jose Velazquez	Lamp Rynearson	Moderate data gathering and modeling of collection systems, when integrated with GIS tools provide a powerful method to integrate knowledge from multiple sources and creates a crosscutting environment for collaboration. They combine powerful visualization tools with strong analytic and modeling to identify sources of I/I and where repairs are needed, track the effectiveness of repairs and manage the budget for continuing to reduce and control I/I.
Homestake Pipeline Internal Crack Repairs Design with Carbon Fiber	Derek Nelson	Dewberry	This presentation discusses the lessons learned through the process of assessing, selecting appropriate rehabilitation technologies, design, and installation for a section of a 66-inch diameter prestressed concrete non-cylinder pipe (PCP). The Homestake Pipeline is a critical piece of infrastructure that conveys approximately 60% of the water supply for each of the Cities of Colorado Springs and Aurora. The technology ultimately selected, and which is the core of this presentation, is a carbon fiber reinforced polymer lining system.
Large Diameter Slipline of an Active 1.5-Mile Sewage Tunnel	Konnor Bursaw	Dewberry Engineers Inc.	The Colman Tunnel Rehabilitation Project utilized a horizontal directional drill machine to pull a 48-inch, 7,614-foot long HDPE pipe into a failing sanitary sewer tunnel while keeping the tunnel in service. After completing the pull, despite limited access to the tunnel, the annular space between the new pipe and existing tunnel was filled with approximately 7,400 cubic yards of low-density cellular grout to prevent future tunnel collapse.
Lessons Learned: Sewer Interceptor Construction Dewatering	John Feldhauser	HDR Engineering	Challenges faced dewatering sewer pipeline construction in the Little Dry Creek Basin. Lessened learned from dewatering sewer pipeline construction in the Front Range and take away for the next project.

Presentation Title	Main Presenter Name	Presenter Organization	Presentation Summary
PCAT – NON-INVASIVE PIPELINE CONDITION ASSESSMENT FOR WATER AND SEWER FORCE MAINS USING INVERSE TRANSIENT PRESSURE WAVE ANALYSIS	Ramsey Hemaïdan	Hydromax USA	Assessing the remaining life of aging water and sewer pipeline systems is key to developing a plan for pipeline maintenance and renewal/replacement programs and there have been little to no technologies that could externally assess and measure wall thickness over long distances - until p-Cat. Non-invasive p-Cat technology provides a low-cost, versatile, and easy to use solution for pressure pipeline condition assessment.
Restoring Water System Confidence with CIPP	Brendan O'Sullivan	Murraysmith	The City of Salem, OR recently completed the rehabilitation and replacement of a critical water main. The 560-foot section of a 30-inch diameter welded steel 1947 pipe, with 200 feet located in Pringle Creek and under a 100-foot wide railroad bridge, was rehabilitated utilizing CIPP and open cut construction methods.
The Lure of Depth-Only Measurements for I&I Assessment	Jay Boyd	ADS Environmental	I/I is a major source of SSO threats and expense in wastewater collection systems. Awareness of how to collect accurate, reliable data is the critical first-step to assess solutions.
Which Came First? The Lift Station or The Flow! A Case Study Demonstrating the Challenge of Designing Lift Stations for Buildout Flow Conditions and Unique Design Elements Incorporated in the Pueblo West States Avenue Lift Station	Peter Hassinger	JVA, Incorporated	In 2018, JVA Inc. began the design process for a unique lift station for Pueblo West Metropolitan District to replace an undersized onsite wastewater treatment system. This presentation will give an overview of the facility, challenges and drivers for wastewater service, how to design for both current and future flows, and creative design changes implemented to achieve regulatory approval.
Conserving Water In The Distribution System While Cleaning Mains And Improving Water Quality	Chris Wilkinson	NO-DES	Hydrant flushing is a horrific waste of water; but needed to maintain water quality and clean distribution system mains! With the realization that there will never be enough water to waste, find out ways for utilities to perform distribution system flushing in a way that meets water quality goals and enables them to conserve water?
Combined Modeling Strategy to Resolve Chlorine Residual and DBP Challenges for Potable Water System	Evan Tromble	Garver USA	This presentation will discuss coupling water quality data, network hydraulic models, and CFD models to develop system-specific operations and maintenance procedures and identify capital improvements needed to improve distribution system water quality. The authors will demonstrate this approach via a recent study for a mid-size water system.
Emerging Renewal Technology for Pressurized Pipelines	Brad Conder	Aegion	This presentation will review four recently installed, high-profile pressure pipe rehabilitation projects that utilized separate trenchless products and processes. A detailed review of each project will walk attendees through the engineering, material construction, installation, and cost-effectiveness of each selection.
Track 5 - Regulations / Water Quality			
Denver Water Variance - Can we put a Square Peg into a Round Hole? Designation of Optimal Corrosion Control Treatment vs. the Lead Reduction Program(Session 4)	Tyson Ingels	CDPHE WQCD	A summary of the drinking water regulator's perspective on alternative treatment techniques, and how the CDPHE WQCD worked as a performance partner with the USEPA and with Denver Water in development and support of the variance; and how others may use this as a learning experience.
Denver Water Variance - Service Line Identification, Prioritization, and Management (Session 6)	Steve Ravel	Mott MacDonald	The methods taken to create and maintain a lead service line inventory; the criteria used for annual prioritization of lead service line replacements; and the preliminary output of the prioritization model will be presented to provide an understanding of the requirements to other entities that may be interested in implementing a similar lead service line replacement program.
Denver Water Variance - Standing Up the Accelerated Lead Service Line Replacement Program (Session 8)	Drew Randall	AECOM	Within a year Denver Water developed, planned, and implemented a lead service line replacement program that has the potential to last for 15-years. The ability to stand up the Program in short-time is attributed to several key components utilized during the development and planning stages.
Denver Water Variance - Strategic Communications & Outreach for Denver Water's Lead Reduction Program (Session 5)	Stacy Chesney	Denver Water	In this session you will learn about Denver Water's public outreach and engagement strategies and tactics; how Denver Water incorporated the principles of health equity to provide access to information with many opportunities and ways to participate; and tools and resources for how to get people engaged and how to reach the hardest to reach communities.
Denver Water's Variance – An Innovative and Holistic Approach to Reducing Lead Levels (Session 1)	Nicole Poncelet-Johnson	Denver Water	Denver Water undertook significant efforts to identify, study, and support an alternative to optimal corrosion control treatment that was protective of public health and the environment. After a year and a half of research and negotiations, EPA granted a variance to the Safe Drinking Water Act allowing Denver Water that includes pH adjustment, lead service line removal, pitcher filters, lead service line inventory, and an extensive communication outreach and education program.
Denver Water's Variance - Demonstrating Equivalency With Data (Session 2)	Chris Corwin	Corona Environmental Cons	A system wide equivalency model was developed to show predicted lead concentrations from the LRP compared to OCCT side-by-side. The model used the system-wide inventory estimate, pilot rack data, immersion study data, and thousands of results from the distribution system from LCR monitoring and Denver Water's customer inquiry testing.
Effluent Temperature Reduction – Cooling or Heat Recovery?	Tanja Rauch-Williams	Carollo Engineers	This presentation will summarize lessons learned from effluent temperature reduction technology evaluations in Colorado in 2019/2020 and provide planning guidance for utilities who are in the process of assessing options for sustainable solutions that minimize negative environmental consequences while protecting Colorado's unique aquatic life.

Presentations at a Glance (Draft-Subject to Change)

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Feasibility of Meeting Future Temperature Limits and Downstream Impacts	Ben Wise	South Platte Water Renewal	In-stream temperature standards will result in more stringent temperature permit effluent limits for many facilities in the coming years. This presentation details how the South Platte Water Renewal Partners, in partnership with Carollo Engineers, used process temperature data and predictive models to quantify the level of cooling necessary to meet future end-of-pipe limits and how in-stream temperature data compares to potential future standards.
Keeping Pace with Colorado's Accelerated Approach to PFAS Control	Sarah Reeves	Brown and Caldwell	Control of PFAS compounds is being accelerated through the use of the narrative standard in Colorado. Testing for PFAS compounds alone is expensive, and treatment and disposal of PFAS from construction dewatering and wastewater discharges is likely to significantly impact utilities across the state.
Putting an End to "Forever" – An Update on PFAS Regulations and Treatment Strategies	Lauren Riedle	Tetra Tech	With traces of perfluoroalkyl and polyfluoroalkyl substances (PFAS) found everywhere, from remote parts of the globe to our own bloodstreams, the widespread presence of PFAS has become a concern both for water professionals and for the public. This presentation aims to provide up-to-date information on the latest PFAS regulations from the US EPA and state regulatory agencies, available treatment strategies for meeting these regulations, and options for responsibly managing PFAS-contaminated biosolids.
Two biosolids contaminants emerging on the regulatory horizon: PFOA and Microplastics	Tanja Rauch-Williams	Carollo Engineers	This presentation summarizes the status of two contaminants emerging on the regulatory horizon in the US specifically for biosolids, PFOA and microplastics, under which conditions to anticipate occurrence and how impacted utilities have approached contaminant management.
Track 6 - Laboratory / Online Instrumentation			
How to Avoid DMRQA Study Trials and Tribulations	Natalie Love	GEI Consultants, Inc.	The DMR-QA study requirements can lead to stress for labs when they don't go as planned. By sharing stories of laboratories experiences getting through failures, and learning special tips and tricks, laboratories can gain confidence for future DMR-QA studies.
New Improvements in Ammonia-Based Aeration Control (ABAC)	Benjamin Barker	YSI Inc, a Xylem brand	Ammonia-based aeration control is enticing but can be difficult to implement. We can use the expertise and learned experiences from those WRRF's that have previously been successful to design new ABAC systems for more facilities in the future.
Non-Contact Turbidimeter Design, Verification, and Calibration	Steve Devilleneuve	SWAN Analytical USA	This paper discusses contact versus non-contact turbidimeter design and the advantages of the non-contact design. Design features that eliminate the need to perform routine calibrations is also discussed.
Water Lab Design on the Front Range– From Remodeling to Constructing New and Facilitating a Paradigm Shift	Rick Hunter	HDR	Discussion of water lab planning approaches to support a range of Owner needs from first step needs assessment / master planning to full project design for new construction. Case study examples will showcase the Westminster Big Dry Creek WWTP lab remodel and new WQ/WW combined lab for City of Loveland.
Track 7 - Wastewater O&M			
"Ooooh that smell, Can't you smell that smell?"	John Kuosman	Garver	This presentation will define the data-driven, root-cause approach to charactering the source, magnitude, and type of odor across the entire City of Grand Junction wastewater system as part of master planning efforts. It will talk about how the data was used to transparently justify an odor mitigation capital improvement program for the City's wastewater operations.
Air Ionization System Odor Control Developments Provide Economies of Scale and Reduced Capital and Operating Costs and New Studies Show it Kills COVID-19	Dennis Tulenko	Trans-Tech Energy and Env	Traditionally, a five (5) ion tube flange mounted module has been standard for polarized air ionization for odor control, but now a more efficient a ten (10) tube ionizer module has been developed and applied at wastewater treatment plants in Colorado. This ten tube ionizer design reduces ionizer hardware requirements by 60% and overall capital equipment expenditures by thirty percent (30%), tube cleaning costs by 50%, and overall O&M by 30%.
Evolution of Temperature Phased Anaerobic Digestion Systems in the U.S.	Steve Krugel	Brown and Caldwell	This presentation will review the evolution of Temperature Phased Anaerobic Digestion (TPAD) systems for wastewater sludge processing. It will contain details and requirements, such as sludge retention times in each phase and will highlight different municipalities across the U.S. that have adopted the TPAD process, some of which are using separate batch tanks to achieve Class A biosolids.
Going Vertical: Simplifying Dewatering by Minimizing Cake Conveyance	Matt Gough	HDR	This presentation discusses the challenges with conveying dewatered biosolids cake, reviews the process employed of pursuing layouts and options to minimize conveyance issues, and establishes criteria that allows other facilities to evaluate what's best for them.
Nothing Funny about Laughing Gas: N2O Production from Post Aerobic Digestion Processes	Christopher Marks	City of Boulder	With the EPA's reclassification of the Denver Metro/North Front Range ozone nonattainment area from moderate to serious the generation of greenhouse gasses and ozone precursors (e.g. N2O) from WRRFs will be an important consideration for future WRRF processes. This presentation aims to provide background on N2O emission pathways, compare N2O emissions from secondary and sidestream processes, quantify emissions of N2O from Post Aerobic Digestion (PAD) processes operating at the City of Boulder's WRRF and the Spokane Regional WRF, and discuss PAD operational conditions that affect N2O emissions.

Presentations at a Glance (Draft-Subject to Change)

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Payback Challenge – Keep Class A, Replace the Technology, and Save Money	Kristen James	HDR	By the end of this presentation the audience will have gained an understanding of the comparative evaluation process performed by the Town of Erie's NWRP that led to the decision to replace their existing biosolids stabilization process with an alternative Class A process that will eventually provide substantial cost savings to the Town. This evaluation process utilizes both economic and non-economic criteria in order to produce an outcome that is best suited for the Town.
The New Soil Around Us – Historical Perspective on Biosolids	Teigan Gulliver	HDR, Inc.	Though biosolids have served a significant benefit in our past, their future is in question with recent poor publicity. In this session, we will explore the past, present, and future of biosolids, challenging the audience to rationalize the benefits and potential concerns of the land application biosolids to raise awareness of a cross-sector, industry-changing potential policy.
Using Hydroxyl Radicals to Treat FOG & Odors and Prevent Corrosion	Michael Tuel	Vapex Environmental, LLC.	This presentation explains how hydroxyl radicals are used to effectively treat odorous compounds, fats, oils and grease (FOG) and microbial induced corrosion.
Track 8 - Water Reuse / Resource Recovery			
Carbon, Corn, and Coronavirus: Renewable Fuel Credit Market Drivers	Dan DeLaughter	Littleton/Englewood WWTP	More and more utilities are embarking down the road to resource recovery. Understanding renewable resource market drivers can be critical to project profitability and communication
Full-scale Demonstration of a Food Waste Preprocessing Technology and Co-Digestion Operation	Ganesh Rajagopalan	Kennedy/Jenks Consultants	Although co-digestion of organic wastes promotes sustainability and enhances resource recovery (i.e. biogas), several technical, economic and regulatory challenges exist for successful implementation of the program. In this session, hear about and discuss a three-year long full-scale demonstration of FOG and food waste co-digestion program, including permitting requirements, food-waste pre-treatment and polishing, digester performance, and operational issues.
Northern Water's New Efficiency Program - A year in review	Frank Kinder	Northern Water	Northern Water provides raw water to 1 million people and is offering new services to help maximize water efficiency. Come learn what, how, where, and why this is taking place, see examples, and your role in the solutions.
Observations and Trends from the First Year of Operation of a Direct Potable Reuse Demonstration Facility in Florida	Jennifer Ribotti	Tetra Tech	This presentation will provide an update on the first year of testing at the City of Daytona Beach's 0.2 MGD FAT potable reuse demonstration facility. Performance will include a review of water quality and process performance data as well as a review of key indicator parameter data that support the resiliency of membrane technologies in water reuse.
Pure Water Monterey: Northern California's First Indirect Potable Reuse Project	Alex Page	Kennedy Jenks	Monterey One Water Agency (M1W) and Monterey Peninsula Water Management District have partnered to create Pure Water Monterey, a \$110M groundwater replenishment project and the first indirect potable reuse project in Northern California. This presentation provides an overview of the PWM project, the treatment technologies selected to meet water quality objectives, and lessons learned from the design, construction, and start-up of the M1W Advanced Water Purification Facility.
Strategic Energy and Biosolids Planning - "Small Utilities Can Dream Big Too"	Bryan Oldham	Hazen and Sawyer	Biosolids and energy management for water resource recovery facilities (WRRF) are evolving nationwide. Goleta Sanitation District assessed several energy production approaches with the goal of gaining energy neutrality.
Time for Hydro	Brett Pugh	Burns & McDonnell	Many utilities simply reduce the incoming pressure on their source water at water treatment facilities. The potential energy of this high-pressure water can be captured using hydroelectric generating systems as a sustainable energy source. - Using a case study at the Town of Erie, this presentation outlines operating conditions favorable to hydroelectric systems and factors impacting feasibility.
WWTP Capacity Expansion for Under \$2M - Advanced Modelling, RTC, and Process Design	RYAN SANFORD	DHI Water & Environment, Inc.	The Viby WWTP increased treatment capacity by 33% without adding any new tankage. Using WEST process modelling, flexible N/dN process design, and advanced control algorithms, a new process configuration and TN controller was implemented that minimizes cost and also ensures compliance.
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