American Water Works Association
Pacific Northwest Section

PO Box 872467
Vancouver, WA 98687
T 503-760-6460
F 360-254-0695
www.pnws-awwa.org

December 1, 2021

Ms. Judy Grycko
OESAC CEU Committee
PO Box 577
Canby, OR 97013-0577

Re: CEU Application for Technical Program Content, Pacific Northwest Section – American Water Works Association (PNWS-AWWA) 2022 Annual Conference.

Dear Judy Grycko,

Enclosed for your review, evaluation and CEU credit approval are about 95 hours of drinking water and 45 hours of wastewater training, for the 2022 PNWS-AWWA Annual Conference, to be held in Tacoma, WA, April 27 – 29, 2022.

The conference will allow water and wastewater professionals the opportunity to enhance their job skills and knowledge. Information and education about topics including engineering, water quality, water resources, water treatment, water distribution, customer service, public information/education, water information technology, water system resilience, regulatory compliance, asset and data management as well as other utility management strategies will be presented during this virtual conference.

Enclosed materials include:

- Program schedule
- Abstracts, which also include training goals and speaker information
- Example of a certificate of attendance

Attendance at sessions during the conference will be tracked by quizzing attendees at the beginning of each session and after each hour of presentations. Registration materials and conference information can be accessed on-line http://www.pnws-awwa.org/conference/ .

On behalf of the Pacific Northwest Section – American Water Works Association, thank you for your time and assistance regarding this request. Should you have any questions, please do not hesitate to contact me at my home office (541) 543-5774 or at jhoyenga@ci.the-dalles.or.us .

Respectfully, Jill Hoyenga
2022 PNWS-AWWA Program Committee Chair
Home office (541) 543-5774

Enclosures

Maximum Possible Water CEUs - 2.0 ID, 2.0 OR, 2.0 WDOH
Maximum Possible Wastewater CEUs - ?? ID, ?? OR, ?? WDOE

2022 Conference Program Schedule

scheduling notes below the calendar

DRAFT - Nov 12, 2021

Wednesday, April 27								
Morning	**Morning Pre-Conference Seminars**							
Room	315	316	317	318	404	405	406	407
Hosting Committee	**Distribution & Water Information Technology**	**Engineering**				Not Available		Not Available
Preconference Seminar	**Cybersecurity in the Water Industry**	**Fire & Ice: Supply Resilience (Part 1)**						
Moderator		**Taylor Stockton**						
8:30	20 - Cybersecurity Tabletop Exercise - Ian Moore	45 - Wildfire and Winter Storm Risk Management Examples - Taylor Stockton						
9:00		127 - Lessons Learned from Wildfire Impacts on Distribution Systems - Rachel Lanigan, Jamie Porter, Mike McClenathan, Ken Johnson, Lacey Goeres-Priest						
9:30 - 9:45 Break								
9:45	20 - Cybersecurity Tabletop Exercise - Ian Moore (continued)	127 - Lessons Learned from Wildfire Impacts on Distribution Systems (cont)						
10:15		127 - Lessons Learned from Wildfire Impacts on Distribution Systems (cont)						
10:45 - 11:00 Break								
11:00	20 - Cybersecurity Tabletop Exercise - Ian Moore (continued)	60 - Total Blackout: Finding Power for the Lake Oswego-Tigard WTP During the Ice Storm of 2021 - Austin Peters, Bret Bienerth						
11:30		52 - Fire and Ice: Stories and Lessons from Wildfires and Ice Storms in Clackamas County - Scott Duren, Todd Heidgerken						

Afternoon	Afternoon Pre-Conference Seminars							
Room	315	316	317	318	404	405	406	407
Hosting Committee	**Distribution & Water Information Technology**	**Engineering**				Not Available		Not Available
Preconference Seminar	**Cybersecurity Tabletop Exercise (Part 2)**	**Fire & Ice: Supply Resilience (Part 2)**						
Moderator		Douglas Lane						
1:00	20 - Cybersecurity Tabletop Exercise - Ian Moore (continued)	74 - Analysis of Risk and Resilience Assessment (RRA) Utility Resilience Index (URI) Scores in the Pacific Northwest - Margarita Rodriguez, Venu Kandiah						
1:30		76 - Planning for Resilience in the Water Industry - Casey Hagerman						
2:00 - 2:15 Break								
2:15	20 - Cybersecurity Tabletop Exercise - Ian Moore (continued)	108 - Planning For and Managing Through a Chemical Shortage - Alex Chen						
2:45		81 - Chlorine Supply Resiliency - The Unexpected - Quianru Deng, Kimberly Gupta, Lyda Hakes, Tyler Kane, Andrew Nishihara, Celia Harvey						
3:15 - 3:30 Break								
3:30	20 - Cybersecurity Tabletop Exercise - Ian Moore (continued)	89 - Coordinated Chlorine Supply Shortage Response: Lessons Learned from PNW Utilities Discussion Panel - Libby Bakke, Kimberly Swan, Kimberly Gupta, Chris Wilson, Susie Smith						
4:00								

Maximum Possible Water CEUs - 2.0 ID, 2.0 OR, 2.0 WDOH
Maximum Possible Wastewater CEUs - ?? ID, ?? OR, ?? WDOE

Thursday, April 28

Morning — Thursday Early Bird Sessions

Room	315	316	317	318	404	405	406	407
Hosting Committee	**Distribution**	**Engineering**	**Customer Service**					
Moderator		Joelle Bennett	Cathy Middleton					
7:00	13 - What If Your Meters Could Hear What You Cannot See? - Martin Vaerum, Karen Siu	43- Delivering Capital Projects: A Young Professional's Guide to Construction Contract Administration - Spencer Adams	167 - Supporting the Customer Service Representative - James Dean					
7:30		75 - Working with Architects 101: Understand the Architectural Design Process and Get What You Want - Casey Hagerman, Kimberly Gupta, Lyda Hakes						

Morning — Thursday Morning Technical Sessions

Room	315	316	317	318	404	405	406	407
Hosting Committee	**Distribution**	**Engineering**	**Utility Management**	**Water Quality & Treatment**	**Research & Water Quality**	**Conservation**	**Wastewater**	**Distribution & Water Information Technology**
Moderator		Nick Augustus		Kay Rottell		Dan Denning	Eric Schey	
8:30	42 - Optimize Water Distribution Pipes and Water Loss With Digital Solutions (WRF 4917) - Michael Karl	46 - How to Start and Fund Asset Management Program From Scratch - Arnab Bhowmick, Bret Heath	106 - Surfing and Cresting (?) the Silver Tsunami - Alex Chen	67 - Developing an Algal Bloom Management and Response Plan - Nancy Feagin, Jolyn Leslie	24 - UVLEDs: From the Plant to the Pipe - Tara Randall, Breanna Real, Emma Wells, Karl Linden	143 - How City of Spokane is Making Water Efficiency as Routine as Recycling - Annikki Chamberlin	158 - Chlorine Residual Testing at Wastewater Facilities - Jeff Lundt, Darwin Phu	25 - Introduction to SCADA Cybersecurity - James Swanson
9:00	133 - Pipeline Asset Management: The Benefits to a Proactive Maintenance Approach - Audrey Leamy, Jeff Austin		36 - Development of a Drinking Water Intersnship Program (DRIP) - Chris Wilson, Jude Grounds, Kimberly Gupta, Derek Robbins	150 - Richland's Lessons Learned When Anatoxin-a Was Found in the Columbia River - Pat Everham	126 - The Impact of Bromide on Chlorine Decay and Disinfection Byproduct Formation - Kyle Shimabuku, Tarrah Henrie, David Schultise		149 - Virtual Factory Acceptance Test: Innovation Developed Through a Pandemic - Tina Hastings, Brian Shuck, Cameron Isaman, Jesse Collins	
9:30 - 9:45 Break								
9:45	4 - The Future of AMI Networks - Matt Zellers	103 - Elevating the City of Lacey's Water System with the Terry Cargil Reservoir - Maricris Orama, Puna Clark	23 - Condition Assessment Made Easy for O&M Personnel - John Koch	120 - Evaluating Options for Taste and Odor Problems (Umpqua Indian Utility Co-op) - Daniel Mosiman, Lee Odell	96 - Optimization of Distribution System Chlorine Residuals Through Chlorine Decay Tests and Hydraulic Modeling - Russell Porter, Keith Stewart, Eric Delfel	54 - Water Curtailment Planning and Outreach – Approaches in Oregon - Suzanne de Szoeke	138 - Why Coat Concrete Structures in Potable and Waste Water Systems - Jeff Austin	63 - Common AWIA Assessment Findings and How To Address Them - Bob George
10:15		113 - Not Just a Day at the Beach: Balancing Competing Priorities While Upgrading an Inlet Station - Sage Ebel	1 - Unleashing the Power of Technology for Effective Communication and Organization - Laura Oxsen	123 - City of Salem - Geren Island WTP Improvements Project Update - John Kenedy, Tim Sherman, Chris Johnson, Tyler Butler, Jude Grounds	101 - Evaluation of Pre-Oxidation and Secondary Disinfection Approaches on DBP Formation and Taste and Odor Using Simulated Distribution System Testing - Anna Vosa	16 - The Whole Conservation Picture: Tracking and Reporting Multiple Programs - Rochelle Gandour-Rood	159 - Biosolids on the Farm - A Virtual Tour - Jon Kercher	
10:45 - 11:00 Break								
11:00	134 - Advanced Metering Infrastructure (AMI) - Is It Now Within Reach for Small to Mid-Sized Utilities? - Andre Noel, Jeff Austin	94 - South Redmond Water Facilities: Using Alternative Delivery to Fast-Track Critical Infrastructure to Serve a New Pressure Zone - Dennis Galinato, Mike Caccavano, Brian Vinson	12 - The Value of Connection - Rebecca Geisen, Bonny Cushman	124 - Salem's Cyanotoxin Response – A Success Story - Nicole Williams, John Kenedy, Chris Johnson, Jude Grounds	88 - Optimizing Corrosion Control Treatment for Low-Alkalinity Source Waters - Damon Roth, Steven Shiokari, Stephen Grooters, Niall Stewart, Laurie Sullivan	5 - How to Conserve Water With Electronic Control Valves and Active Pressure Management - Robert Velasquez, Steve Causseaux	156 - Listen Closely, Your Sewers Are Talking to You - Brogan Quist	62 - Surviving SCADA Ransomware Attacks - Bob George
11:30	14 - Tacoma Water's AMI Technology Roadmap, a 10-year Digital Journey Plan - Alex Puryear, Corey Bedient	31 - Couldn't Have Done it Any Other Way: Progressive Design-Build of an Urban Stormwater Pipeline - Patrick Weber, Christa Lee	22 - Engaging O&M Staff to Improve the Design of the Bull Run Filtration Facility - Willis Carr	141 - Creating a Crystal Ball: The Future of Harmful Algal Bloom Forecasting Using Artificial Intelligence - Alena Thurman, James Watson, Matt Titus	91 - Using Bench Scale Coupon Testing to Assess Lead Reduction Performance in Portland's Water Supply Across a Range of Coagulants and Corrosion Control Treatment Methods - Anna Vosa, Alex Mofidi, Melinda Friedman, Yone Akagi, Mac Gifford, Danbi Won			

12:00 - 1:30	Vendor Lunch / Division Meetings							
Afternoon	**Thursday Afternoon Technical Sessions**							
Room	315	316	317	318	404	405	406	407
Hosting Committee	**Distribution**	**Engineering**	**Utility Management**	**Competitions***	**Research, Water Quality, Treatment**	**Treatment**	**Wastewater**	**Distribution & Water Information Technology**
Moderator		Bill Reynolds					Eric Schey	
1:30	27 - Pumps and Motor Condition, Optimization and Reliability Evaluation - Gregg Davidson	84 - ENVISIONing a Green Building Policy that LEEDs the Way - Holistic Sustainability for Infrastructure Facility Design - Wendy Macdonald, Christopher Bowker, Summer Gorder	30 - Facility Planning for More Than Capacity - Patrick Weber, Zachary Brown	144 - Top Ops	125 - Using UV and Fluorescence Spectroscopy to Monitor and Predict PFAS, MIB, and Emerging Contaminant Removal by Activated Carbon - Kyle Shimubuku, R. Scott Summers, Myat Thandar Aung, Natalia Soares-Quinete, Joshua Kearns	110- Managing a Diverse, High-Performance Team for Portland's Bull Run Filtration Project - Josh Miner, Lyda Hakes, Rachel McGinn, Nicki Pozos, Kyle Sandera	154 - Benefits of Recycled Water - Chris Stoll	47 - New Tech Normal and Digital Revolution - Arnab Bhowmick, Bret Heath
2:00		79 - I Gotta Insulate What?! - Energy Code Compliance for Minimally Conditioned Buildings - Alan Armstrong			34 - Collaborative Pilot-Scale Evaluation of GAC and IX Medias for Removal of PFAS from Groundwater - Adam Chang, Charles Powley, Jay Guyer	56 - Bull Run Filtration Project: 60% Design Update - Lyda Hakes, David Peters, Michelle Cheek, Mark Grahm, Jude Grounds		
2:30 - 2:45 Break								
2:45	131 - Aging Water Storage Reservoir Evaluations: Where Do I Begin? - Greg Lewis, Chris Young	119 - Balancing the Water Equity Equation - Andrew Nishihara	15 - Minimizing Apparent Losses: City of Bend's Analytical Approach to Revenue Recovery - Spencer Cashwell, Alex Puryear	145 - Gimmicks & Gadgets	83 - From Bench Test to Reality: Comparing Operations of Full-scale PFAS Treatment Facilities to Preliminary Bench Scale Test Results - Stephen Timko	73 - What's Next? Planning the Future of Clackamas River Water's WTP - Ali Leeds, Adam Bjornstedt, Austin Peters, Connor Mancosky	157 - Cascadia WWTP Facility Virtual Video Tour - Jon Kercher, Chris Stoll, Laurie Pierce, Dennis Cosset	90 - How Lakewood Water District Uses ArcGIS and UtiliSync 811 to Manage Utility Locates - Matt Stayner, Kevin Wyckoff
3:15	135 - Tank Asset Management & Maintenance Programs: A Viable Alternative to Traditional Run-to-Fail Maintenance Procurement - Jeff Austin	104 - Sustainable Infrastructure - Advances in Concrete Construction - Matthew Perkins, Jordan Palmeri	35 - Fear, Uncertainty and Doubt with Cybersecurity - Nate Palmatier, Victor Perez-Bonilla		55 - How Ion Exchange (IX) Shoehorns PFAS treatment into a Tight Site - Esther Chang, Josh Kennedy	80 - Prioritization Matters – How Aging Infrastructure, Treatment Needs, and Site Layout Inform the Butterfield WTP's Expansion - Brandon Dunagan, Ali Leeds, Britney Whitfield, Joe West		
3:45 - 4:00 Break								
4:00	136 - Role of Smart Tanks in Distribution Water Quality Management - Ethan Brooke, Jeff Austin	39 - InPipe Hydropower Generation - City of Hillsboro's Story - Nesh Mucibabic, Tacy Steele	48 - The Show Must Go On: Business Continuity and Emergency Response - Arnab Bhowmick, Bret Heath	Fresh Ideas Poster Contest	70 - PFAS vs Lead and Copper Rule Compliance - Beth Mende, Pierre Kwan, Tony Nguyen, Greg Keith, Bob York	57 - Making the Most of Your WTP, Increasing Capacity and Reliability at the Medford Water Commission WTP - Joshua Kennedy	160 - PFAS and Biosolids - Current Issues and a Look Forward - Todd Williams	155 - Digital Twins - Eion Howlett
4:30	7 - Enhancing Supply Flexibility and Accommodating Storage Facility Maintenance through the Construction of a Critical Regional Supply Source - Chris Kelsey, Jordan Zier	18 - Permitting, Design, Technology and Construction of a Micro Hydropower Facility for the City of Beaverton - Adam Odell, Sheila Sahu			111 - Addressing Unforeseen Challenges with Spent Media Disposal: The City of Issaquah, WA Experience - Beth Mende, Pierre Kwan, Bob York, Greg Keith	44 - Take it to the Limit – Hydraulic Testing at Maximum Instantaneous Plant Capacity - Spencer Adams		11 - Real-time Software for Distribution System Operations: An Operator-Focused Design Approach - Marcelo Cusacovich, Justin Bowling, Samantha White, James Uber, Sam Hatchett, Srinivas Kulkarni

Maximum Possible Water CEUs - 2.0 ID, 2.0 OR, 2.0 WDOH
Maximum Possible Wastewater CEUs - ?? ID, ?? OR, ?? WDOE

Friday, April 29

Morning — Friday Early Bird Sessions

Room	315	316	317	318	404	405	406	407
Hosting Committee	**Distribution**	**Engineering**						
Moderator		Greg Loscher						
7:00	10 - Pipe Thrust Restraint Buried - Doug Schlepp, Dan Kegley	29 - Hydraulic Control Valve Fundamentals - Steve Causseaux						
7:30	9 - Pipe Thrust Restraint Exposed - Daniel Kegley, Doug Schlepp							

Morning — Friday Morning Technical Sessions

Room	315	316	317	318	404	405	406	407
Hosting Committee	**Distribution**	**Engineering**	**Public Information**	**Water Quality & Treatment**	**Diversity and Inclusion**	**Water Resources**	**Cross Connection Control**	**Treatment**
Moderator		Erika Murphy	Andrea Watson	Virpi Salo-Zieman		Andrew Austreng	James Dean	
8:30	8 - Clearing the Air on Air Valves: Air/Vac/Air Release Valves Design, Selection, and Sizing - Steve Causseaux	132 - Spray In Place Pipe Rehabilitation: Trench-less Technology Utilizing Advanced, 100% Solid, High Mil Epoxy Lining Systems - Audrey Leamy, Jeff Austin	153 - What You and Your Community Need to Know About WIFIA - Kim Marshall, David Stangel	105 - Pilot Testing for Iron and Manganese Removal: Successes and Challenges for Two Water Districts - C. Aaron Gress, Lee Odell, Jay Breen	64 - Using Data to Drive Water Equity - Christine Boyle	2 - Water Rights Mitigation Pilot Project - Challlenge, Status, and Opportunity - Jason Van Gilder	162 - Understanding the Costs When You Fail to Protect Drinking Water Resources - Terry Pickle	72 - Filtering the Options in Grants Pass - Ali Leeds, Jason Canady, Adam Smith, Steve Flett
9:00	3 - Hydraulic Control Valve Training - Mike Uthe	115 - Restoring Water System Confidence with CIPP - Brendan O'Sullivan, Michael Linn	161 - Modernizing the Cross Connection Control Program Reporting, Compliance, and Communications to Meet 21st Century Needs - Joel Cary, Khalil Howell	38 - Process Control and Treatment Optimization for Groundwater with Elevated Ammonia and Manganese - Alex Mofidi, Karen Heneghan, Michael Hallett, Andrew Hill, Al Vetrovs, Stephen Booth, Brant Wood	71 - A Utility Starts Its Equity Journey - Lee Lindsey, Tacy Steele, Nicki Pozos	128 - Snoqualmie Pass Utility District – Water Right Portfolio Optimization - Tyson Carlson	164 - Using Community-Based Social Marketing to Promote Cross-Connection Control Compliance - Jessica Shaw	
9:30 - 9:45 Break								
9:45	85 - Leveraging a Hydraulic Model Across An Entire Organization - Daniel Reisinger, LaDonne Harris	37 - It's Not About What's on the Outside, It's What's on the Inside that Counts! A Story of Pipeline Rehabilitation - Ryan Smith, Nicholas Augustus	148 - Water Workforce Development Through the Education Pipeline - Tacy Steele, Kristi Wilson, Chris Wilson	78 - Implementation of Taste & Odor Improvements at Scotts Valley - Milt Larsen	59 - Maximizing Water Management Dollars While Bringing Transparency, Equity and Multiple Benefits - Morgan Shimabuku, Sarah Diringer	87 - How Small Water Providers Are Using ASR to Help Manage Supplies - Ellen Svadlenak, Larry Eaton	163 - Backflow Incident Response: Dana Street Irrigation Cross Connection - Jessica Shaw	102 - Restoring Filtration Performance at the Deer Creek WTP - Pierre Kwan, Scott Dunn, Jay Prosser
10:15	117 - Using Hydraulic Modeling to Support Storage Evaluation and Operational Changes - Aurelie Nabonnand, Adib Altallal, Natalie Reilly	82 - Replacing the South Fork Tolt River Project Low Level Outlet Regulating Valve - Ulysses Hillard, Val Kovalishyn		69 - Converting an Unchlorinated System to Full Chlorination / Arsenic / Manganese Treatment - Beth Mende, Pierre Kwan, Greg Rae	53 - Integrating Social Equity Into the Bull Run Treatment Projects - Nicki Pozos, Lyda Hakes	129 - Three for the Price of One - Using Aquifer Storage and Recovery to Reduce Peak Demands, Increase Storage, and Meet Emergency Backup Requirements - Randy Mueller, Brad Phelps, Mark Crowell	165 - Increasing the Protection of the Water System and Finding Money, Political Support & Understanding Where There May Not Be Any - Loren Searl	97 - City of Sultan Water Treatment Plant: Improvements to Expand Capacity and Enhance Plant and System Safety, Reliability and Resiliency For a 2-MGD Treatment System - Kristy Warren, Nate Morgan, Jefferson Moss
10:45 - 11:00 Break								
11:00	61 - Putting Tools in One Place: How Lakewood Water District Integrates Field Data Systems - Kevin Wyckoff	121 - Whack-A-Mole: Waterproofing a 100-Year-Old Clear Well - Matt Hickey, Lori Schumacher, Kiera Usagawa	152 - Communications Awards - Kim Marshall, Andrea Watson	146 - Manganese Management in Distribution Systems - Andrew Hill	19 - Communicating with Engineers - Getting Operators and Engineers to Understand Each Other - Michael Grimm	33 - City of Othello Aquifer Storage and Recovery: Source Treatment and Program Implementation - Andrew Austreng	166 - Communication During a Backflow Incident - Customers, the Media and the Utility - Scott Hallenberg	116 - Pilot Testing Membrane Filtration to Treat Surface Water for Aquifer Storage and Recovery (ASR) - Brian Rowbotham, Lee Odell
11:30	50 - Calibrating Distribution System Models – From the Field to the Desktop - Zach Schrempp	114 - Replacement of 110,000 gpm of Pumping: Designed Solutions and Lessons Learned - Pat Van Duser, Liz Edgar, Cameron Isaman		28 - Investigating Manganese Accumulation, Release, and Mitigation in Tacoma Water's Large Diameter Transmission Mains - Melinda Friedman, Kim DeFolo, Virpi Salo-Zieman, Chris McMeen, Ali Leeds	147 - King County Wastewater Treatment DEI Efforts - Robert Tovar	21 - Condition Assessment of a 100-Year Old Well Station - Kenny Janssen, Joe Foote		68 - Anacortes WTP Optimization with Advanced Analytics - Isaac Brunk, Jamie Lefkowitz

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Maximum Possible Wastewater CEUs - ?? ID, ?? OR, ?? WDOE

12:00 - 1:30	Awards Lunch							
Afternoon	**Friday Afternoon Technical Sessions**							
Room	315	316	317	318	404	405	406	407
Hosting Committee		**Engineering**		**Board of Trustees**		**Water Resources**		**Treatment & Research**
Moderator		Taylor Stockton						
1:30		65 - Practical Applications for Transient Ground Shaking in the Design of Earthquake Resistant Welded Steel and Ductile Iron Pipelines - Mike Britch		set up for Meeting		40 - All in One: The Benefits of Integrating Comprehensive Long-term Water Supply, Treatment, and Distribution Planning - Connor Mancosky, Alena Thurman, Adam Steele		140 - Pilot Operations: Foundations, Adaptation During On-Site Operations, and Lessons Learned - Mia Vijanderan, Lynn Williams Stephens, Mac Gifford, Thomas Krause, Rick Norris, Damon Roth
2:00		66 - Seismic Design Quality Control Practice to Improve Overall Seismic Performance of Large Water Transmission System Pipelines and Facilities - Mike Britch				41 - You Cannot Conserve Your Way Out of Infrastructure Improvements - Michelle Johnson, Brandon Rose		100 - Bull Run Water: Investigating Coagulation, Flocculation and Sedimentation at Pilot Scale - Mojtaba Azadiaghdam, Humberto Piedra-Ruiz, Mac Gifford, Anna Vosa, Melanie Roy, Thomas Krause
2:30 - 2:45 Break								
2:45		95 - Seismic Resilience Without Breaking the Bank - Matthew Perkins, Bryan Robinson		Board of Trustees Meeting		92 - An Experimental Technique for Protecting Wells Without Pump Systems - Andrew Wentworth, Larry Eaton		93 - Bull Run Treatment Program (BRTP) - Headloss Characterization and Performance of Three Different Dual Media Filter Configurations - Humberto Piedra-Ruiz, Mac Gifford, Anna Vosa, Mojtaba Azadiaghdam, Thomas Krause, Melanie Roy
3:15		118 - Optimizing Use of FEMA Funding – Gresham Grant Butte 10 MG Seismic Upgrades - Matt Hickey, Chris Young, Jason Branstetter, Wendy Andaya				99 - Keep the Water Flowing: Staying Ahead of the Water Demand Curve in a Multi-Source System - Joe Foote, Nathan Black, Heather Pina		122 - Pushing Rapid Gravity Filtration Rates into the 21st Century – Demonstrated Performance at 16 gpm/sf - Katerina Messologitis, Mike Nacrelli
3:45 - 4:00 Break								
4:00		98 - Streamlined Pipeline Seismic Design - Geotechnical and Pipeline Modeling for An Essential Pipeline Project - Wolfe Lang, Geoff Bee		Board of Trustees Meeting		139 - Seeing Purple: Final Design of the City of Beaverton's Non-potable Water System for Municipal Irrigation - Ronan Igloria, Priya Dhanapal, David Winship, Jason Melady, Alex Bargmeyer		112 - Advancing Beyond Excel: Applying the R Software Environment for Water Quality Data Analysis - Karina Woodland, Damon Roth, Mia Vijanderan
4:30		49 - Where's the Backbone? Installing New Watermains to Create a Seismically Resilient Backbone Through Distribution Systems - Andrew Barrett				151 - Groundwater Source Development for Rockwood Water People's Utility District and the City of Gresham - Kari Duncan		77 - What to Do With All This Data? Automated Analysis and Reporting of Data from Two WTP Pilot Tests - Enoch Nicholson

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2022 Annual Conference, Tacoma, WA April 27 – 29

Greater Tacoma Convention Center 1500 Commerce St., Tacoma, WA 98402

Session ID: DWITPCAM01 **Date:** 4/27/2022 **Length of Session:** 180 minutes

Area of Relevancy: Both

Presentation Title: Cybersecurity Tabletop Exercise, Part 1

Abstract: The primary message I'd like to get across to the audience is that ransomware is prevalent in our environments and if we don't take the necessary actions now, our organizations may be at risk. The cost to adjust and maintain controls in our environments are far cheaper than the short-term cost of paying a ransom and the long-term cost of having your data leaked and your reputation tarnished.

CEU Relevance Statement: My presentation will cover the current trends in ransomware and the 10 key actions an organization can take today to shore up those controls, from CISA best practice products. The discussion will include how the actions can be applied in the OT environment and the IT environment.

Author: Ian Moore **Author's Job Title:** Cybersecurity State Coordinator / Advisor

Email: Ian.Moore@cisa.dhs.gov **Phone:** (360) 594-1832

Organization: Cybersecurity and Infrastructure Security Agency (CISA) by Department of Homeland Security

Primary Job Duties: Cybersecurity State Coordinator / Advisor

Related Prior Employment:

Registrations or Certifications:

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Greater Tacoma Convention Center 1500 Commerce St., Tacoma, WA 98402

Session ID: DWITPCPM01 **Date:** 4/27/2022 **Length of Session:** 180 minutes

Area of Relevancy: Both

Presentation Title: Cybersecurity Tabletop Exercise, Part 2

Abstract: The primary message I'd like to get across to the audience is that ransomware is prevalent in our environments and if we don't take the necessary actions now, our organizations may be at risk. The cost to adjust and maintain controls in our environments are far cheaper than the short-term cost of paying a ransom and the long-term cost of having your data leaked and your reputation tarnished.

CEU Relevance Statement: My presentation will cover the current trends in ransomware and the 10 key actions an organization can take today to shore up those controls, from CISA best practice products. The discussion will include how the actions can be applied in the OT environment and the IT environment.

Author: Ian Moore **Author's Job Title:** Cybersecurity State Coordinator / Advisor

Email: Ian.Moore@cisa.dhs.gov **Phone:** (360) 594-1832

Organization: Cybersecurity and Infrastructure Security Agency (CISA) by Department of Homeland Security

Primary Job Duties: Cybersecurity State Coordinator / Advisor

Related Prior Employment:

Registrations or Certifications:

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2022 Annual Conference, Tacoma, WA April 27 – 29

Greater Tacoma Convention Center 1500 Commerce St., Tacoma, WA 98402

Session ID: EngPCAM01 **Date:** 4/27/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Wildfire and Winter Storm Risk Management Examples

Abstract: The more frequently occurring risks can rise to the top in overall water system risk analysis. Water utilities learned lessons during the wildfire and winter storm incidents of 2020 and 2021. How did those lessons influence their recent risk assessment, management, and response planning work? Several case studies provide examples of how OR and WA water utilities are working to reduce their fire and winter-storm risks.

CEU Relevance Statement: Risk management relative to wildfire and winter storm risks is essential for both operations and management. On the operations side risk management can related to changes in standard operating procedures and changing maintenance programs. On the management side risk management influences the projects planned to reduce risks; management also has to drive changes in operation. Operators can use this information to reduce risks to water source and treatment and therefore improve water quality, supply, and public health protection.

Author: Taylor Stockton **Author's Job Title:** Project Manager

Email: tstockton@rh2.com **Phone:** 5032785356

Organization: RH2 Engineering Inc

Primary Job Duties: Manage and lead engineering roles in water infrastructure and resilience projects. Lead ShakeAlert Earthquake early warning system projects for RH2.

Related Prior Employment: 4 years at a water treatment equipment company providing design and management. 8 years at an international consulting firm providing water and wastewater infrastructure design services.

Registrations or Certifications: Oregon PE

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Greater Tacoma Convention Center 1500 Commerce St., Tacoma, WA 98402

Session ID: EngPCAM02 **Date:** 4/27/2022 **Length of Session:** 105 minutes

Area of Relevancy: Drinking Water

Presentation Title: Lessons Learned from Wildfire Impacts on Distribution Systems

Abstract: Pacific Northwest wildfires in the last few years have caused unprecedented damage in the urban environment, and water utilities are taking notice of this ever-increasing threat. Wildfires have impacted dozens of water utilities by depleting storage, damaging facilities, impacting supply sources, and disrupting water quality. How can we prepare our staff and customers to best respond and quickly recover from a wildfire? In this panel discussion, we will hear the stories from five water utilities engaged in wildfire in 2020 to get deeper insights into the fire situation, unexpected impacts, operations decision-making, response strategies, and lessons learned. From their experiences we aim to identify specific actions for water utility operators and managers to better prepare for this ongoing threat.

CEU Relevance Statement: Wildfires pose a unique threat to water utilities, requiring specific emergency response and recovery efforts. Utilities have an opportunity to better prepare their staff and water system infrastructure to respond to wildfires by hearing about recent experiences from other water utility operators and identifying actions to implement now. Better preparedness can lead to increased safety and shorter water system recovery times to help the overall fire recovery process.

Author: Rachel Lanigan **Author's Job Title:** Senior Engineer

Email: rachel.lanigan@medfordwater.org **Phone:** 541-774-2452

Organization: Medford Water Commission

Primary Job Duties: Water system planning, managing capital projects, identifying operational improvements, emergency response planning, supply and demand tracking.

Related Prior Employment: Consulting engineer doing water master planning, seismic resilience planning, hydraulic modeling for 18 years.

Registrations or Certifications: Oregon and California PE

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Greater Tacoma Convention Center 1500 Commerce St., Tacoma, WA 98402

Session ID: EngPCAM03 **Date:** 4/27/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Total Blackout: Finding Power for the Lake Oswego-Tigard WTP During the Ice Storm of 2021

Abstract: The Lake Oswego-Tigard Water Treatment Plant (WTP) was designed and constructed in 2014 with two electrical supply feeds, serving the WTP and two electrical supply feeds serving the River Intake Pump Station (RIPS). It was decided during the design that, given the redundancy in power supply, backup generators to power the WTP and the RIPS were not needed. In February of 2021, unprecedented ice-storms knocked out the power supply in many communities in northern Oregon, including all four of the electrical feeds to the LO-T WTP and RIPS. During the extended duration of this outage, Lake Oswego / Tigard staff were able to acquire portable generators and arrange for electrical patch-ins to bring the WTP and RIPS back online. This presentation will discuss the challenges encountered and provide planning recommendations based on lessons learned from this experience.

CEU Relevance Statement: Resiliency can be achieved in forms other than installed infrastructure. This presentation will discuss the ingenuity of WTP staff in bringing their facility back on-line and share lessons learned for minor modifications to supply, treatment, and distribution components that other utilities could incorporate into their systems.

Author: Austin Peters **Author's Job Title:** Design Manager

Email: apeters@carollo.com **Phone:** 503-290-2818

Organization: Carollo Engineers

Primary Job Duties: Austin has focused his engineering career on the design and optimization of water treatment plants. Bret runs the LO-T WTP, including the intake pump station, managing the staff and overseeing the water treatment process to provide clean drinking water to the cities of Lake Oswego and Tigard.

Related Prior Employment: Austin has been working in the water industry for 15 years and has worked on projects all across the U.S.; from small 0.5 mgd community water systems to large 300 mgd regional facilities. Bret has been working at the LO-T WTP for over 10 years.

Registrations or Certifications: Austin: Professional Engineer - Oregon, Washington. Bret: Water Treatment Level 4 Operator and Water Distribution Level 1

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Session ID: EngPCAM04 **Date:** 4/27/2022 **Length of Session:** 30 minutes

Area of Relevancy: Both

Presentation Title: Fire and Ice: Stories and Lessons from Wildfires and Ice Storms in Clackamas County

Abstract: In 2020 and 2021, water agencies in Clackamas County faced unexpected challenges due to historic wildfires and wide-spread power outages caused by an ice storm, all in the midst of a global pandemic. These events coincided with the preparation of Risk and Resiliency Assessments and Emergency Response Plans in compliance with the 2018 AWIA requirements, allowing utilities to test out actual procedures and identify best practices in real-time, and to reflect on improvements in preparedness ahead of future events. This presentation will be a panel discussion to share stories and lessons learned around various aspects of the emergency response effort including coordination and collaboration amongst agencies, public information and messaging, operational challenges within treatment facilities and in the distribution system, and administrative challenges related to staffing and internal coordination.

CEU Relevance Statement: Operators will gain insights into emergency preparation and response best practices. Ideas will also be shared for improvement by multiple water agencies with different organizational structures and unique systems that may be directly applicable to attendee's organizations.

Author: Scott Duren **Author's Job Title:** Vice President

Email: sduren@wsc-inc.com **Phone:** 9167647824

Organization: Water Systems Consulting

Primary Job Duties: Project Manager and Office Lead in WSC's Portland Oregon office, delivering a wide range of water and wastewater planning, design, and construction projects for municipal water agencies in CA, OR, and WA.

Related Prior Employment: Over 20 years of experience as a consulting engineer in the water and wastewater industry.

Registrations or Certifications: Professional Engineer in OR, WA, and CA.

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Session ID: EngPCPM01 **Date:** 4/27/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Analysis of Risk and Resilience Assessment (RRA) Utility Resilience Index (URI) Scores in the Pacific Northwest

Abstract: America's Water Infrastructure Act of 2018 (AWIA) required water systems to complete a Risk and Resilience Assessment (RRA) by June 30, 2021. One system assessment evaluated in the RRA is the Utility Resilience Index (URI), which scores a system's operational and financial resilience, and capability to respond and recover from incidents that impact critical assets. The URI can inform utilities on their resiliency and indicate possible improvements. However, since URI scores are not publicly available, nor statistics provided on national or regional scores, it is difficult for systems to assess their performance since they are looking at a score in isolation. This work plans to conduct a survey to gather information on URI scores across the Pacific Northwest. Survey data will be used to develop statistics that will paint a picture of resiliency in the region, and provide benchmark values that utilities can use to assess their URI scores and aid in evaluating potential improvements.

CEU Relevance Statement: All community water systems were recently required to complete a risk and resilience assessment (RRA) per new Federal regulations. As part of the RRA they determined a system assessment measure, the Utility Resilience Index (URI) which measures their operational and financial resilience and provides them with a URI score. Since there is no published information on the URI scores of other utilities, nor statistics or averages, utilities are limited to using their score in isolation to come up with strategies and improvements to increase resiliency. This work will provide benchmark values, which will allow operators and utilities to compare their performance to other utilities in the region, and can provide them with additional information to help make a more informed decision on operational and financial capability improvements that they can undertake.

Author: Margarita Rodriguez **Author's Job Title:** Engineer

Email: mrodriguez@bhcconsultants.com **Phone:** 206-357-9965

Organization: BHC Consultants, LLC

Primary Job Duties: Margarita Rodriguez served as project engineer, and Venu Kandiah as technical lead and project manager, on multiple RRA projects for utilities of various sizes that BHC Consultants worked on. Both have completed the AWWA Utility Risk and Resilience certification. Margarita has been with BHC Consultants for two years and has overall 4 years of experience in consulting engineering primarily in engineering planning and design support on municipal water resources projects. Venu has been with

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BHC Consultants for two years and have overall 15 years of civil engineering experience in water resources planning and management, and hydraulics engineering.

Related Prior Employment: Margarita has worked for consulting firms over her 4-year career. Venu has worked at a number of consulting firms over his career, and also has experience working at a public utility and a developer of hydrologic and hydraulic modeling software.

Registrations or Certifications: Margarita and Venu are certified in AWWA Utility Risk & Resilience Program. Venu has his professional engineering (PE) license in Washington and California.

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Session ID: EngPCPM02 **Date:** 4/27/2022 **Length of Session:** 30 minutes

Area of Relevancy: Both

Presentation Title: Planning for Resilience in the Water Industry

Abstract: With the new reality of climate change and a focus toward resiliency, what are the implications of planning and budgeting for both seasonal and worst case threats to plant operations? Architects, engineers and water clients explore the implications and impacts on facilities, staffing and facility needs in a lesson's learned format showcasing current project examples.

CEU Relevance Statement: Design for resiliency affects all aspects of water infrastructure planning and operations. Operators will learn how resilient design can make their job of maintaining water quality more efficient, safe, and reliable.

Author: Casey Hagerman **Author's Job Title:** Project Manager/Associate

Email: chagerman@mwaarchitects.com **Phone:** 503-416-8006

Organization: MWA Architects

Primary Job Duties: Project Manager, Project Architect

Related Prior Employment: not applicable

Registrations or Certifications: Licensed Architect, AIA Member

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Session ID: EngPCPM03 **Date:** 4/27/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Planning For and Managing Through a Chemical Shortage

Abstract: In mid-2021, a regional supply of chlorine and related chemicals hit the Pacific Northwest with relatively little advance notice. This presentation will discuss SPU's experience. Topics covered will include advance contingency planning – and how that can differ from what happens in real life; managing through the event, including implementing those contingency plans; communicating with customers and the media; regional planning and coordination with other utilities and state agencies; and lessons learned.

CEU Relevance Statement: This presentation is relevant to the O&M and management of a water system. Without a supply of critical chemicals, the safety of the public water supply will be adversely affected. Good planning and good management through a supply shortage can help ensure the continued safety of the drinking water supply.

Author: Alex Chen **Author's Job Title:** Branch Deputy Director, Drinking Water

Email: alex.chen@seattle.gov **Phone:** 2063353651

Organization: Seattle Public Utilities

Primary Job Duties: Manage the drinking water utility and utility-wide operations and maintenance. Major responsibilities include long term planning for the utility, CIP and O&M budget management, operations and maintenance of the reservoirs and rivers and wellfields used for water supply, and management of crews from "forest to tap" serving 1.5 million people.

Related Prior Employment: 1994-1998 Process Engineer, East Bay Municipal Utility District. 1998-2000 Project Manager, Black & Veatch. 2000-2005 Project Manager, Tetra Tech/KCM.

Registrations or Certifications: Professional Engineer, Washington. Water Treatment Plant Operator IV, Washington. Water Distribution Manager IV, Washington. MS Civil/Environmental Engineering

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Session ID: EngPCPM04 **Date:** 4/27/2022 **Length of Session:** 30 minutes

Area of Relevancy: Both

Presentation Title: Chlorine Supply Resiliency: The Unexpected

Abstract: The chlorine supply disruption in summer 2021 has shed light to overall resiliency considerations about chlorine and hypochlorite supply chain. This presentation will evaluate supply resiliency and discuss design implications of several source chemicals for chlorination in the Pacific Northwest: chlorine gas, bulk hypochlorite, and salt for on-site hypochlorite generation. This presentation will also share case studies of regional water treatment facilities, including Portland Water Bureau, on their approach to secure future chlorine supplies.

CEU Relevance Statement: This presentation will discuss design implications to promote chemical supply resiliency. This presentation will also share lessons learned about emergency response to chlorine supply shortage.

Author: Qianru Deng **Author's Job Title:** Process Engineer

Email: qdeng@carollo.com **Phone:** 2065385176

Organization: Carollo Engineers

Primary Job Duties: Design and optimization of water treatment facilities

Related Prior Employment:

Registrations or Certifications: PE

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Session ID: EngPCPM05 **Date:** 4/27/2022 **Length of Session:** 60 minutes

Area of Relevancy: Both

Presentation Title: Coordinated Chlorine Supply Shortage Response: Lessons Learned from PNW Utilities - Discussion Panel

Abstract: A critical chlorine supply chain issue caused by equipment failure at a major chlorine manufacturing facility in Longview, WA created an emergency situation for Pacific Northwest water and wastewater utilities. Utilities took the few proactive steps available to them to solve the problem, including reducing chlorine use and asking customers to reduce outdoor water use. In Oregon and Washington, utilities worked directly with one another, the Governor's Office, regulatory agencies, DEQ, the Oregon Office of Emergency Management (OEM), and utilizing Oregon Water/Wastewater Agency Response Network (ORWARN) and federal authorities to coordinate ordering, storing and distributing the chlorine supply they needed. The panel, consisting of representatives from the key agency stakeholders and regulators, will share lessons learned from these 'ad hoc' coordination efforts, and discuss with attendees way to improve communications and resilience of our wet infrastructure in the PNW.

CEU Relevance Statement: Water and wastewater utility workers at all levels, consultants, managers and regulators will all gain critical insights and knowledge on responding to major water quality crisis's, and share in developing best practices in the future.

Author: Jude Grounds **Author's Job Title:** Engineer

Email: jgrounds@carollo.com **Phone:** 5039361112

Organization: Carollo Engineers

Primary Job Duties: Jude supports water treatment planning, design and construction projects throughout the PNW, and manages Carollo Engineers' Oregon operations.

Related Prior Employment:

Registrations or Certifications: PE in OR and WA

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Session ID: DistEBT01 **Date:** 4/28/2022 **Length of Session:** 60 minutes

Area of Relevancy: Drinking Water

Presentation Title: What If Your Meters Could Hear What You Cannot See?

Abstract: Non-revenue water remains one of the water industry's main challenges and up to 31% of the water loss comes from leaks in utility service connections. Locating these leaks can be like finding a needle in a haystack. Being placed on private property, knowledge about the state of the service connections can be limited. Therefore, leakage detection is often based on a combination of trial and error, theoretical models and simple gut feeling. If you don't know where your distribution network is leaking, how can you offer the best possible service to your consumers? How do you prioritize your daily efforts? Where do you find your basis for assessing the need for maintenance and future investments?

CEU Relevance Statement: Faster and more efficient leak detection using acoustic leakage detection and an analytics platform allows utility managers to reduce the cost per identified leak and find the low-hanging fruit for reducing non-revenue water. This lowers operational costs as less water is distributed and limits costs of meeting legislative requirements and environmental goals.

Author: Martin Vaerum **Author's Job Title:** Product Manager

Email: mov@kamstrup.com **Phone:** 4703733004

Organization: Kamstrup Water Metering, LLC

Primary Job Duties: I have a BEng in Global Business Engineering and currently work as Commercial Product Manager for water systems at Kamstrup. My areas of expertise include data analytics and data communication in general, as well as pressure manage-ment and smart water solutions. I make sure that our current products and services are being maintained, updated, and continue to meet customers' demands. This means I get to cooperate with a lot of different branches within Kamstrup – salespeople, developers, and marketers. Furthermore, I have close ties with Kamstrup's Business Development Team, aiding with the development and shaping of Kamstrup's future products and services.

Related Prior Employment:

Registrations or Certifications:

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Session ID: DistTAM01 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Optimize Water Distribution Pipes and Water Loss With Digital Solutions (WRF 4917)

Abstract: Digital technologies offer efficient ways to optimize the operation and maintenance of buried water infrastructure. Brown and Caldwell is leading a Water Research Foundation (WRF) project (WRF 4917) that will provide utilities with a clear understanding of how smart water network solutions can help water utilities better manage pressures and flows extend the life of their water distribution networks and reduce water loss. This research project developed four case studies across the globe to pilot different solutions and developed a guidance manual that includes best practices and a step-wise approach to planning, designing, technology specifications, and implementing solutions to better control pressure and reduce water loss.

CEU Relevance Statement: This presentation will inform operators and engineers how to better manage pressure using state of the art technology to reduce water loss.

Author: Michael Karl **Author's Job Title:** National Optimization Lead

Email: mkarl@brwncald.com **Phone:** 5039776654

Organization: Brown and Caldwell

Primary Job Duties: I lead optimization services across North America providing solutions to utilities that help them make the most of what they have.

Related Prior Employment: I worked at CH2M Hill for 10 years.

Registrations or Certifications: WDM2

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Session ID: DistTAM02 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Pipeline Asset Management: The Benefits to a Proactive Maintenance Approach

Abstract: Many water systems utilize the run-to-fail method of Pipe Replacement responding to critical needs after significant failure. This approach leads to a much higher risk of emergency repairs, catastrophic main breaks, customer disruption, and higher maintenance costs. Adopting a proactive approach can reduce and eliminate pipe failure lowering maintenance costs and disruptions. A Pipeline Asset Management Program utilizes the latest technologies to identify critical infrastructure and execute optimized pipe renewal & maintenance to achieve proactive pipe maintenance. Machine learning technology combined with strategic field condition assessment allows for a risk-based program design addressing likelihood and consequence of failure to identify and address the highest risks areas. This approach reduces/eliminates the high cost of run-to-fail and allowing redirecting of emergency budget to facilitate a transition to a proactive maintenance approach.

CEU Relevance Statement: This presentation will review a preventive maintenance approach to prioritize and minimize investment needs including: - Unique technologies. -Risk-Based analysis to identify hot spots using basic utility data and other external databases. -Pipe condition assessment in hot spots to validate segments that need to be renewed. -Data collected annually helps to improve accuracy and measure performance (WQ, leaks, pipe life). -Network Condition Assessment with Machine learning and Non-Intrusive Pipeline Surveys. It will be demonstrated how a properly designed Pipe Asset Management Program represents a more sustainable and cost effective approach to pipe maintenance the traditional “run to failure” strategy.

Author: Audrey Leamy **Author’s Job Title:** SIPP Project Manager

Email: Audrey.Leamy@suez.com **Phone:** (478) 987-0303

Organization: Suez - Advanced Solutions

Primary Job Duties: Line of Business Manager for Sues - Advanced Solutions' Pipe Rehabilitation and Maintenance Division.

Related Prior Employment:

Registrations or Certifications:

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Session ID: DistTAM03 **Date:** 4/28/2022 **Length of Session:** 60 minutes

Area of Relevancy: Drinking Water

Presentation Title: The Future of AMI Networks

Abstract: Mueller Systems will discuss the different AMI technologies currently on the market, discuss the pros and cons of each technology, and provide information about how a City, utility, or water district can decide which meter technology is right for them. Selecting the correct AMI network can impact the daily job of the operator, but also of management, administration, and Public Officials. AMI Systems are no longer just strictly Water Meter reading networks, as some providers now offer networks that can allow Cities and Towns to become Smart Cities. Smart City technology allows town to communicate with other devices to better manage not only their water systems, but a wide variety of battery powered Smart devices in their town.

CEU Relevance Statement: Water Meters, and the AMI networks that collect these meter reads, are the revenue center for all water utilities. AMI data can be aggregated and intergrated with SCADA data, then used to analyze and optimize system operations, and in hydraulic modeling used to identify system deficiencies and assist in engineering design. Some AMI networks are evolving past just capturing hourly meter reading, which can allow the utility to better deploy their labor and materials. AMI network that operate on a Smart City network all the City to track other important public health area of concern, for example gas leaks, water flooding, pests, manholes open/close, etc.

Author: Matt Zellers **Author's Job Title:** Territory Manager

Email: mzellers@muellerwp.com **Phone:** 5033105993

Organization: Mueller Systems

Primary Job Duties: Matt Zellers is the Territory Manager for Mueller Systems and covers Oregon, Washington, and Idaho. Matt works closely with distributors and utilities to help them select the right water meter and water meter technology that works best for each Utility.

Related Prior Employment: Matt has been a territory manager for 9 years.

Registrations or Certifications: N/A

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Session ID: DistTAM04 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Advanced Metering Infrastructure (AMI) - Is It Now Within Reach for Small to Mid-Sized Utilities?

Abstract: Water utilities are better understanding AMI and the advantages and benefits it can provide over other technologies. However with this understanding there still remains the challenge of maintaining the system making AMI justifiably within reach for small to medium sized utilities. Are there any new strategies and options that are available today to bring AMI within reach for small to medium sized utilities? This presentation will discuss and provide answers to these topics.

CEU Relevance Statement: This presentation will discuss some new and innovative options that small and medium utilities now have to deploy, operate and maintain a modern AMI system. Traditional utility based deployments as well as “cloud” based alternatives will be discussed. This presentation will include be a basic review of AMI and AMR technologies, how they function and what makes them smart. It will also discuss how AMI can be made affordable and applicable to small to medium sized utilities utilizing a new approach to procurement, installation, on-going operations and maintenance for a complete integrated AMI system. Case studies demonstrating the benefits realized in real world deployment of AMI will be reviewed.

Author: Andre Noel **Author’s Job Title:** Director of Revenue Management

Email: andre.noel@suez.com **Phone:** (334) 322-8251

Organization: Suez - Advanced Solutions

Primary Job Duties: Andre is a leading specialist and technical expert in the selection, installation, testing and troubleshooting of AMI/Metering products and services in water distribution.

Related Prior Employment:

Registrations or Certifications:

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Session ID: DistTAM05 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Tacoma Water's AMI Technology Roadmap, a 10-year Digital Journey Plan

Abstract: In 2020 Tacoma Water began their transition to AMI. Early in the process Tacoma Water understood there was future value to be unlocked and unique problems to be solved with digital solutions that further leveraged their AMI investment. Tacoma Water's AMI Technology Roadmap looked 10-years into the future and strategically mapped out short-, medium-, and long-term technology adoption goals that spanned the entire organization. These goals took into consideration current state, AMI rollout timeline, technology solution interdependencies, financial and staff resources, complementing or conflicting organizational goals, and future state technologies. The outcome of this project was a Technology Roadmap that can help guide Tacoma Water to their desired future state.

CEU Relevance Statement: This presentation will help utility operations and management by giving them ideas and tools that Tacoma Water used to work across the organization to complete a cohesive technology roadmap. One example being how internal charters and steering committees were set up within Tacoma Water to make sure all organizational department technology adoption goals were voiced. The presentation will also provide insights on the value of thinking long-term about technology adoption and how to further leverage AMI / Organizational investments.

Author: Alex Puryear **Author's Job Title:** Client Solutions Manager

Email: alexander.puryear@gmail.com **Phone:** 509-703-8339

Organization: Xylem

Primary Job Duties: Alex works as a Client Solutions Manager on Xylem's Digital Solutions team. Alex has worked extensively with both private and public water utilities across the United States and Canada. As of now he is primarily focused on working with clients on their digital journey in the Pacific Northwest. Alex holds a B.A. from Arizona State University, School of Technology and Innovation and a MBA from Gonzaga University, School of Business.

Related Prior Employment: Alex has over 5 years of experience in the water industry and has specifically focused on bringing digital solutions to water and wastewater utilities. These solutions have spanned from wastewater treatment optimization strategies, to non-revenue water lo

Registrations or Certifications: MBA

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Session ID: DistTPM01 **Date:** 4/28/2022 **Length of Session:** 60 minutes

Area of Relevancy: Both

Presentation Title: Pumps and Motor Condition, Optimization and Reliability Evaluation

Abstract: How to develop an accurate picture of the true condition of pumps and motors using vibration, motor winding, power quality, energy signature and thermal imaging analysis. Learn how to reduce power costs through efficient operations, lower maintenance and operational costs, avoid service impacts due to preventable equipment failure and more accurately determine the life expectancy of pumps and motors.

CEU Relevance Statement: Pumps and motor systems are vital to the successful operation of a water and wastewater systems - wells, booster pump stations and lift stations are a critical component of may municipal systems. Readily available technology can help reduce unexpected failures as well as the cost of regular inspection and maintenance. Simple operational changes can result in significant improvements in efficiency and ultimately the cost to operate these systems.

Author: Gregg Davidson **Author's Job Title:** Staff Engineer

Email: Gdavidson@rh2.com **Phone:** 4252214517

Organization: RH2 Engineering Inc

Primary Job Duties: Preformed diagnostic testing of pumps and motors for both water and waste water systems. Analysis of existing infrastructure for capital planning and budget development.

Related Prior Employment: None

Registrations or Certifications: Vibration Analysis CAT1

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Session ID: DistTPM02 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Aging Water Storage Reservoir Evaluations: Where Do I Begin?

Abstract: This presentation will discuss case studies of the approaches the City of Bellingham and Tacoma Water took to develop detailed scoring and assessment rubrics and the field evaluations of 17 potable water storage tanks of various construction types and capacities. The presentation will discuss the approach and factors considered when creating the scoring criteria, which factored input from multiple utility departments and consultants. Attendees will learn specific considerations including in-service vs off-line inspection; evaluating the condition of each reservoir to establish a baseline; prioritizing and designing repairs and upgrades to ensure safe and reliable potable water for the communities; and compliance of repair work.

CEU Relevance Statement: Operators and management will learn about various aspects and considerations for evaluating water storage facilities. These criteria include seismic resiliency, water quality, intrusion prevention and ease of operations, and maintenance.

Author: Greg Lewis **Author's Job Title:** Project Manager

Email: greg.lewis@psengineers.com **Phone:** 2538302140

Organization: Peterson Structural Engineers

Primary Job Duties: Greg is a licensed Professional Engineer with 10 years of engineering consulting experience. Prior to joining PSE, Greg served for 10 years in the armed forces, worked in a structural research laboratory and was employed as a Civil Engineer for the US Forest Service. Greg leads nearly all of PSE's reservoir work in Washington State which includes site evaluations, structural assessments, seismic upgrade designs and new designs for tanks of all materials.

Related Prior Employment: Greg is an Army veteran and was previously employed by the US Forest Service prior to joining Peterson Structural Engineers.

Registrations or Certifications: Professional Engineer (WA, OR CT), AWWA Member

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Session ID: DistTPM03 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Both

Presentation Title: Tank Asset Management & Maintenance Programs: A Viable Alternative to Traditional Run-to-Fail Maintenance Procurement

Abstract: Preventive Tank Maintenance Programs can substantially delay or eliminate the need to replace a utilities large capital investment and often result in lower life-cycle maintenance costs and improved water quality compared to the traditional approach to tank maintenance. AWWA M42 “Steel Water Storage Tanks” offers support for this approach stating: “A good, comprehensive preventive maintenance program can extend the life of an existing tank indefinitely." Under a preventative tank maintenance procurement concept the tank owner contracts directly with a qualified tank maintenance contractor to evaluate, plan and provide all maintenance and repair needed for their water storage facilities on an ongoing basis. Recent changes in Washington Law specifically allow for a municipality or water district to contract for management of water storage assets.

CEU Relevance Statement: This presentation will discuss the different types of preventative maintenance programs available to tank owners and how they differ from the traditional means of tank maintenance procurement. Six benefits of full service preventive tank maintenance programs will be discussed: single source responsibility, balanced funding, evaluation and planning, regulatory & GASB 34 compliance, annual inspection and maintenance, and emergency repair service. Tank maintenance programs can meet the requirements of GASB 34 for asset management programs under the modified approach to infrastructure asset reporting, assuring the tank owner the tank value will never drop below the declared value. In addition, Washington's RCW 35.21.945 and RCW 57.08.041 which allow any municipality or water to district elect to contract for asset management service of its water storage assets will be covered.

Author: Jeff Austin **Author’s Job Title:** Water System Consultant

Email: jeffrey.austin@suez.com **Phone:** 503-713-8823

Organization: Suez - Advanced Solutions

Primary Job Duties: Water Systems Consultant with SUEZ – Advanced Solutions. Assist water and waste water systems in developing long-term infrastructure asset rehabilitation and management solutions.

Related Prior Employment:

Registrations or Certifications:

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Session ID: DistTPM04 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Role of Smart Tanks in Distribution Water Quality Management

Abstract: The emergence of "smart tank" design and operations provides utilities with the ability to utilize water storage tanks as water quality intervention points. Tanks provide the perfect intervention point to solve THM spikes and low disinfectant residuals. This presentation will examine the under-utilized water storage tank as an asset that can be used to improve distribution water quality with several methodologies. Several cases studies that illustrate "smart tank" technology improving chlorine residuals, reducing THM's and maintaining chloramine residuals will be included in the presentation.

CEU Relevance Statement: Some of the largest water utilities in the country have turned to Smart Tanks to solve their disinfectant residual issues and keep their THM levels low as highlighted in a recent AWWA Partnership for Safe Water webinar. This presentation will discuss chloramine chemistry, THM aeration, and thermal de-stratification using active mixing.

Author: Ethan Brooke **Author's Job Title:** Regional Sales Manager & Senior Product Manager

Email: ebrooke@ugsicorp.com **Phone:** 917-501-7358

Organization: UGSI

Primary Job Duties: Ethan Brooke is an internationally recognized expert on aeration technologies for trihalomethane (THM) removal. A summary of his master's thesis on THM aeration was published in the Journal American Water Works Association and resulted in three patents which are held by the University of New Hampshire. Ethan has a background in civil engineering and product management and has worked on a variety of water, wastewater and distribution system infrastructure improvement projects.

Related Prior Employment: Has been with PAX since 2013. Previously worked as a consulting engineer for three years and was a research assistant at the University of New Hampshire.

Registrations or Certifications: Vice Chair for distribution system water quality, Cal nav AWWA

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Greater Tacoma Convention Center 1500 Commerce St., Tacoma, WA 98402

Session ID: DistTPM05 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Enhancing Supply Flexibility and Accommodating Storage Facility Maintenance through the Construction of a Critical Regional Supply Source

Abstract: With the trend of rapid development within the South Hill area, Firgrove desired a new primary supply source to its highest pressure zone that would be able to assist in meeting increased demands, as well as maintain stable pressures when the only storage facility within the zone is taken off line for scheduled maintenance. The pump station, which draws water from a Tacoma regional supply line, was designed to operate in both “open zone” and “closed zone” configurations, with the latter allowing pumps to match system demand while Firgrove’s Site 100 standpipe is offline for recoating and maintenance. The facility incorporates features that accommodate potential fluctuations in suction and discharge side pressures, while the design rate also allows the utility to maximize this supply source through the transfer of water to other pressure zones. Design and permitting challenges, construction issues and photos of this facility, now placed into successful operation, will be presented.

CEU Relevance Statement: The Intertie #4 Pump Station is critical to the operation, maintenance, and management of Firgrove's complex water system. It introduces a major source of supply whose operation can be managed and flow controlled to optimize distribution system water quality, overall water supply production costs, and increase redundancy that allows other critical supply facilities to be removed from service when needed. Firgrove's operators were a part of the project's design development, control strategy implementation, and construction observation and commissioning. They continue to make system supply decisions on a daily basis that determines the extent of benefit the utility receives when bringing the pump station online.

Author: Chris Kelsey **Author’s Job Title:** Project Manager

Email: chris.kelsey@bhcconsultants.com **Phone:** 206-357-9915

Organization: BHC Consultants, LLC

Primary Job Duties: Chris Kelsey and Jordan Zier are professional engineers and project managers for BHC Consultants within their Tacoma office. Chris has more than 30 years of local water utility planning and design experience; has been a PNWS-AWWA member for nearly 25 years; and has been involved with the Section’s Water Treatment Committee for the past 20. Jordan has 14 years of water and wastewater planning and design experience; and has been a PNWS-AWWA member for over 3 years.

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Related Prior Employment: Chris has worked for water utilities as a consultant for various companies over his 30-year career. Jordan has spend his entire career at BHC Consultants.

Registrations or Certifications: Chris is a Project Management Professional (PMP) and has his professional engineering (PE) license in Washington, Oregon and Alaska.

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Session ID: EngEBT01 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Both

Presentation Title: Delivering Capital Projects: A Young Professional's Guide to Construction Contract Administration

Abstract: Construction contract documents are the foundation of every capital project. As a design engineer, you must prepare construction contract documents that guide the contractor to meet the owner's objectives. Construction contract documents are made up of several parts, including the procurement requirement, general conditions, general requirements, design drawings, technical specifications. While most design engineers get exposure to design drawings and technical specifications early on in their careers, the "front-end documents" often remain a mystery. Exposure to front-end documents is crucial to understanding how construction contracts are procured and how the components of the construction contract work together to help create a successful project. This presentation aims to help fill in that gap and empower young professionals to seek out and learn about contract documents and construction contract administration.

CEU Relevance Statement: This presentation is designed for graduate engineers, most likely in consulting engineering roles, or anyone who wants to learn more about the delivery of capital projects. This presentation will help the audience understand: 1) What are construction contract documents, and what are they made up of? 2) What is contract administration, and what is the engineer's role? 3) What are the industry standards in construction contracting? 4) How can I learn more and get involved with preparing contract documents? 5) Why are high quality contract documents important to the owner?

Author: Spencer Adams **Author's Job Title:** Water Project Manager

Email: spencer.adams@jacobs.com **Phone:** 214-335-7810

Organization: Jacobs

Primary Job Duties: As a project manager for municipal water projects, I am responsible for managing the scope and the delivery of the design of engineering projects, including the preparation of procurement and construction contracting documents. I manage the engineering services during construction including construction contract administration and change management. As a water industry professional with 10 years of experience and multiple project-delivery-related industry certifications, it is my responsibility to help our clients manage risk and build an aspiration for quality across all the members of the project delivery team.

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Related Prior Employment: Previously employed as a project manager for capital facility projects for the Gwinnett County Department of Water Resources in Atlanta, Georgia, including primarily water treatment plant and pump station work. Prior to tenure in the public sector, worked

Registrations or Certifications: Professional Engineer (GA, MI, OR, TX); Public Drinking Water System Operator Class III (GA); Designated Design-Build Professional (DBIA) ; Certified Construction Contracts Administrator (CSI)

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Session ID: EngEBT02 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Both

Presentation Title: Working with Architects 101: Understand the Architectural Design Process and Get What You Want

Abstract: It's move in day for your new building and already the storage rooms are too small and you could use another couple offices. Why is the restroom door visible from the front entry? During the design process there are a million decisions made by either the owner, architect, MEP engineers, or all of the above. Some decisions are intentional, and some are made through necessity. In this session you will gain a better understanding of the architectural process, especially the pre-design, programming, and information gathering phases, so that you can work more efficiently with architects, advocate for your programming requirements, and in the end, get what you want out of your new building.

CEU Relevance Statement: This presentation will help operators collaborate efficiently with building design professionals during the design phase to better ensure functional, safe, and low-maintenance operations once the building or facility is complete.

Author: Casey Hagerman **Author's Job Title:** Project Manager/Associate

Email: chagerman@mwaarchitects.com **Phone:** 503-416-8006

Organization: MWA Architects

Primary Job Duties: Project manager and project architect for multiple large water and wastewater facilities across the western United States.

Related Prior Employment: not applicable

Registrations or Certifications: Licensed architect, AIA member

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Session ID: EngTAM01 **Date:** 4/28/2022 **Length of Session:** 60 minutes

Area of Relevancy: Both

Presentation Title: How to Start and Fund Asset Management Program From Scratch

Abstract: Local govts. are still struggling with maintenance and operations of their assets, while trying to comply with regulations, condition assessments, budgeting, and reporting requirements. We will touch on the maintenance management and asset management basics, and go beyond into strategic / capital planning and project execution. Local govt. confront challenges with comprehensive plans and rate studies, spends a lot on those, yet they are not equipped with a plan based on real time condition and data from the field. This session will discuss beyond the basics, how ailing and failing infrastructure can be identified and prioritized for repair, rehab or replacement, how capital budgets and plans can be developed, how maintenance crew becomes integral part of the strategic planning, how activities and tasks can be forecasted and budgeted, and how projects can be managed within budget and timeline effectively. It is an immersive session including funding strategies and starting from scratch.

CEU Relevance Statement: We teach this class everywhere including rural water, special districts, city conferences in multiple states. We also teach multiple CEU driven classes on this topic year round with those organizations. Operators, Managers, Council and Board members learn the needs and wants of such system, and how these systems can help them do their job economically, efficiently, productively while meeting safety, regulatory and compliance requirements. This also helps secure more funds and grants, and direct those towards the service of the citizens.

Author: Arnab Bhowmick **Author's Job Title:** Founder and CEO

Email: ARNAB@AAKAVS.COM **Phone:** 4252453569

Organization: Aktivov Asset Management

Primary Job Duties: Arnab has more than 21+ years of technical and managerial experience in business and operations, asset maintenance and management, GIS, emergency management, IT security, strategic planning etc. He is currently the Chair of American Public Works Association (APWA) Asset Management Committee and has been advising the CxO level executives, City and District managers and department heads for couple decades on asset management, GIS and IT strategies, business continuity, technology trends, and e-governance.

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Related Prior Employment: He has worked for many corporations including Weston Solutions, ESRI, Tata Group, founded Aktivov Asset Management and Aakavs Consulting, and has a bachelors in Civil Engineering and masters in GIS/BIS and sustainable engineering technologies.

Registrations or Certifications: BE,MS,GISP,LEED AP

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Session ID: EngTAM02 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Elevating the City of Lacey's Water System with the Terry Cargil Reservoir

Abstract: How does a City address a growing population with an increased water demand which contributes to a system storage deficiency and temporary pressure sags? The solution—an elevated tank—required a creative approach to work within the constrained site adjacent to a residential neighborhood while balancing the City key criteria: cost efficiency, safety, and ease of operations and maintenance. Seamless collaboration with the City's Utility Engineers and Operations & Maintenance Staff was key to addressing interests and concerns while developing the design for the 1.25 million gallon reservoir. The City's first composite elevated tank, which serves the largest pressure zone, will be named after Terry Cargil—an employee who served in the City's Water Department for over 40 years. This presentation will discuss how the City/Consultant design team focused on the big picture and balanced the sometimes competing requirements from City interests, system operation needs, and outside stakeholders.

CEU Relevance Statement: This presentation will discuss the conceptual design of a composite elevated tank to address temporary pressure deficiencies and meet the need of increased water demand to serve one of the City's largest pressure zones. This elevated tank style will reduce City maintenance costs throughout the life cycle of the reservoir and provides additional storage for City use. Additionally, City Operation and Maintenance Staff were involved in the reservoir design to identify and address key maintenance issues and concerns, as well as ensure the facility is operator-friendly with safe working conditions.

Author: Maricris Orama **Author's Job Title:** Professional Engineer

Email: mari.orama@murraysmith.us **Phone:** 253-355-3656

Organization: Murraysmith

Primary Job Duties: Mari Orama has a MS in Civil Engineering from the University of Washington and an EdD from Nova Southeastern University. Mari has over 10 years of experience as an engineering consultant and joined Murraysmith in 2019, where her experience includes planning and design of water infrastructure projects.

Related Prior Employment:

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Registrations or Certifications: Mari Orama: Professional Engineer in WA, AWWA Member. Puna Clarke: Professional Engineer in WA and CA

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Session ID: EngTAM03 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Not Just a Day at the Beach: Balancing Competing Priorities While Upgrading an Inlet Station

Abstract: Located in the popular Enatai Beach Park, the City of Bellevue's aging inlet station presents operational and maintenance challenges including being undersized and not having safe access for City employees. As a result, the City undertook a project to improve the inlet station to meet future demands and operations staff needs. With many stakeholders involved, this project must not only balance the interests of the City's water operation staff but also that of Seattle Public Utilities and the Parks Department, as well as consider proposed King County interceptor improvements and WSDOT right-of-way constraints. This presentation will discuss how the project team balanced these competing priorities to design a safe, modern, and operator-friendly water supply facility. Discussion of lessons learned during construction will be included.

CEU Relevance Statement: The facility will incorporate multiple modes of operation with communication to remote facilities. Learning about potential control strategies available with modern control valves will provide operators with insight into potential control alternatives not previously considered. Additionally, operators will be familiarized with several modern approaches to maintenance accessibility and safety that were included in the design of the inlet station.

Author: Sage Ebel **Author's Job Title:** Engineering Designer

Email: sage.ebel@murraysmith.us **Phone:** 970-390-6223

Organization: Murraysmith

Primary Job Duties: As a staff engineering designer at Murraysmith, Sage supports aspects of water, wastewater, and stormwater projects in various capacities ranging from planning, modeling, and design to inspection and construction support.

Related Prior Employment:

Registrations or Certifications: Engineer-In-Training

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Session ID: EngTAM04 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: South Redmond Water Facilities: Using Alternative Delivery to Fast-Track Critical Infrastructure to Serve a New Pressure Zone

Abstract: Construction is underway on the South Redmond Water Facility project for the City of Redmond, Oregon, designed to provide water supply and storage for the City's pressure zones. The $16 M construction project includes a 4 MG Type 1 concrete reservoir, and a pump house with a 3,500 gpm well pump and booster pumps with 7,600 gpm capacity. After opting for a construction manager/general contractor (CM/GC) design process to expedite the project schedule, the City partnered with Murraysmith + Quincy to spearhead the team selection process and complete final design. Emery & Sons Construction Group was ultimately selected as the CM/GC partner. This presentation will discuss the process and challenges of delivering this project from conception during master planning to implementation during construction. It will also highlight a case study about the CM/GC advantages of using this delivery method when faced with a tight construction timeline and challenging construction conditions.

CEU Relevance Statement: There are many cases where schedule and budgets are constrained making it difficult to design and construct critical water infrastructure. CM/GC is a valuable tool that Water System managers can use to overcome some of these challenges. Certified operators can benefit from this presentation as it will describe how the City operations staff input was critical in driving design, schedule, and budget decisions for this project.

Author: Dennis Galinato **Author's Job Title:** Principal Engineer

Email: Dennis.Galinato@murraysmith.us **Phone:** 208.947.9033

Organization: Murraysmith

Primary Job Duties: Dennis has been a project manager with Murrraysmith, delivering water, wastewater, and water resource projects throughout the Northwest since 2007. Dennis has served as the Office Lead in Boise since 2012.

Related Prior Employment:

Registrations or Certifications: Professional Engineer in Idaho, Oregon, and Washington

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Session ID: EngTAM05 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Both

Presentation Title: Couldn't Have Done it Any Other Way: Progressive Design-Build of an Urban Stormwater Pipeline

Abstract: This session will focus on the procurement, design, and early construction for progressive design-build delivery of a large diameter stormwater pipeline through downtown Tacoma and new outfall to Thea Foss Waterway. The session will cover why progressive design-build delivery was selected for the project, and how the flexibility and adaptability of the delivery method was leveraged to help address a multitude of challenging site conditions, permits, transportation crossings, with the ability to continually adjust in the face of new developments. It will include tips and lessons learned for conducting a procurement and overseeing progressive design-build implementation from an owner's perspective.

CEU Relevance Statement: None. Relevant to utility managers and engineers.

Author: Patrick Weber **Author's Job Title:** Owner Advisor

Email: pweber@brwncald.com **Phone:** 5098638631

Organization: Brown and Caldwell

Primary Job Duties: Patrick Weber is a civil engineer with Brown and Caldwell's Seattle office. He has 15 years of experience in drinking water, stormwater, and wastewater engineering. Patrick specializes in engineering planning and alternative delivery Owner Advisor services for public utility clients.

Related Prior Employment:

Registrations or Certifications: P.E., PMP

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Session ID: EngTPM01 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Both

Presentation Title: ENVISIONing a Green Building Policy that LEEDs the way - Holistic Sustainability for Infrastructure Facility Design

Abstract: As we begin the second decade of the 21st century, it is imperative that sustainability initiatives be baked into the design of infrastructure facilities. Many utilities embrace their own sustainability goals or are required to pursue benchmark certifications to prove and memorialize achievement of sustainability goals. The challenge then is how to craft and manage designs that "check the box" without chasing points, while still meeting core sustainability goals. In addition to the City of Portland's progressive sustainability mandates, the Bull Run Filtration Facility project team has pulled from research-based sustainability rating systems such as LEED and Envision to create a custom sustainability strategy to meet project goals. Learn how the Bull Run Filtration Facility project team leveraged a holistic approach to sustainability in order to meet project goals and community values.

CEU Relevance Statement: Many sustainability initiatives including requirements for operations and maintenance. Operators will learn how the approach to these initiatives will affect day to day operations and maintenance.

Author: Wendy Macdonald **Author's Job Title:** Sustainability Consultant

Email: wendy.macdonald@stantec.com **Phone:** 250-415-1693

Organization: Stantec Consulting

Primary Job Duties: Wendy is a professional engineer with 21 years of experience in energy conservation, sustainability and a background in mechanical design. Her role is to support clients and projects teams in understanding, developing, clarifying, and realizing their sustainable goals. Wendy is also a member in several committees seeking to initiate improvements in the sustainable world, most notably in the Canada Green Building Council (CaGBC) Zero Carbon Building Standard Steering Committee and the CaGBC's Energy & Engineering Technical Advisory Group. Because of her active involvement in the community, she was the grateful recipient of the Canada Green Building Council's 2017 Volunteer Leadership - Technical award.

Related Prior Employment: Advicas Group Consultants, Hirshfield Williams Timmins Mechanical Consultants

Registrations or Certifications: PEng, LEED AP BD+C, ENV SP

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Session ID: EngTPM02 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Both

Presentation Title: I Gotta Insulate What?! - Energy Code Compliance for Minimally Conditioned Buildings

Abstract: Today's energy codes are constantly evolving in an attempt to mitigate building operational energy impacts on climate change. The industry has seen two major energy code updates in two years, with Oregon and Washington adopting some of the most rigorous energy codes in the country. But who cares right? Your minimally heated pump station that just has a five watt electric resistance unit heater tacked up in the corner doesn't need insulation right? Wrong. The latest codes have curtailed or eliminated historically reduced thermal envelope provisions for minimally conditioned buildings. In this session you will gain an overview of the intent behind energy codes and current best practices for design implementation. Hear from architects, engineers, and other professionals on real-world experience in the design and construction of energy compliant minimally heated buildings.

CEU Relevance Statement: Operators will learn how energy codes can drive the design, construction, and maintenance of minimally heated buildings.

Author: Alan Armstrong **Author's Job Title:** Owner, Architect

Email: alan@strongworkarchitecture.com **Phone:** 503-966-1816

Organization: Strongwork Architecture LLC

Primary Job Duties: Alan is the owner and principal architect for Strongwork Architecture.

Related Prior Employment: Previously employed at MWA Architects with work focused in the water infrastructure sector.

Registrations or Certifications: Licensed Architect in OR and WA, AIA member, Living Future Accreditation

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Session ID: EngTPM03 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Both

Presentation Title: Balancing the Water Equity Equation

Abstract: Implementing quality and resiliency when replacing aging water and wastewater infrastructure can come at a premium cost. Often, these costs are absorbed or passed on to customers. This can create a greater imbalance in affordability of basic water and wastewater services for those most vulnerable. This presentation will cover some examples from other utilities who have balanced the cost-equity equation and how this is coming more towards the forefront of industry.

CEU Relevance Statement: This presentation aims to inform attendees about the challenges and opportunities of looking at new capital, improvement, or replacement projects through a water equity lens. Strategic partnering, stakeholder engagement, or targeted implementation can have increased benefits for vulnerable groups and communities at large. Case studies from other water and wastewater utilities throughout the US will be presented.

Author: Andrew Nishihara **Author's Job Title:** Civil Engineer

Email: andrew.nishihara@stantec.com **Phone:** 208-573-0849

Organization: Stantec Consulting

Primary Job Duties: Civil Engineer with a focus on water treatment infrastructure planning and design. Serve in various capacities as a project manager, engineering technical lead, or staff engineer depending on project scope and scale.

Related Prior Employment:

Registrations or Certifications: Civil PE (OR, WA, HI); ENV SP

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Session ID: EngTPM04 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Both

Presentation Title: Sustainable Infrastructure - Advances in Concrete Construction

Abstract: Water infrastructure requires concrete, massive amounts of concrete. Concrete accounts for 8% of human production of carbon dioxide, with the tools available to us today we can significantly reduce the environmental impact of concrete. This presentation will discuss how we can reduce our environmental impact of concrete through performance specifications, new technologies, and new products, without increasing cost.

CEU Relevance Statement: This presentation is related to the design and construction phases of projects when concrete is being specified, bid, and constructed. The presentation will discuss concrete durability, and how this relates to operations and O&M efforts.

Author: Matthew Perkins **Author's Job Title:** Structural Engineer

Email: matthew.perkins@stantec.com **Phone:** 5033125606

Organization: Stantec Consulting

Primary Job Duties: Matt has 14 years' experience in water infrastructure design with Stantec, he spends most of his time these days as the Project Technical Lead for the Portland Water Bureau's Filtration Facility project.

Related Prior Employment: Not applicable

Registrations or Certifications: Matt has PE licenses in California, Oregon, Washington, and Hawaii, and a structural engineers license in Oregon. Jordan holds a MS in Environmental Science from Tulane University.

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Session ID: EngTPM05 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: InPipe Hydropower Generation - City of Hillsboro's Story

Abstract: The City of Hillsboro water distribution system receives water from two high pressure transmission mains via several pressure reducing stations to lower transmission pressures from approximately 140 psi to the 80 psi necessary for the distribution system. Based on the average water demand of approximately 20 mgd, potential for hydropower generation is estimated at 2.5 Million kWh per year. The In-pipe Hydropower Generator, installed in fall 2020, is the first renewable energy project featuring the In-PRV. The system manages pressure for Hillsboro Water while generating up to 200,000 kWh of electricity per year that is fed back into the grid, offsetting the City's cost of energy and helping to power Hillsboro's stadium complex. Since the majority of this project was funded through grants (Renewable Development Fund and Energy Trust) Hillsboro should see a total return on its investment in less than five years.

CEU Relevance Statement: This generator is designed for easy, low-impact installation and is located in a bypass where it provides redundancy to an existing valve. The sensors and software are integrated into the SCADA system, allowing Hillsboro Water to monitor pressure, flow and electricity production 24/7. This, combined with the system's ability to manage pressure at both high and low flows, helps the city more efficiently manage their water operations while helping preserve the life of their infrastructure. It is relevant to the work of certified operators, as they can manage their water systems while also producing electricity that reduces system costs. Operators, Managers and others are likely to be interested in hearing about how Hillsboro successfully incorporated this new technology into its system, and about what it takes to operate, manage, and maintain the in-pipe hydro-generator to its full potential.

Author: Nesh Mucibabic **Author's Job Title:** Principal Engineer

Email: Nesh.Mucibabic@hillsboro-oregon.gov **Phone:** 503-358-7855

Organization: City of Hillsboro

Primary Job Duties: Principal Engineer responsible for planning and design of engineering projects - including the planning, design and construction of Hillsboro's In-Pipe Power Generation Facility

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Related Prior Employment: 35 years experience in planning, designing, and construction of municipal industrial,mining, and hydropower projects in Canada, Chili, Argentina, Bolivia, The Philippines and former Yugoslavia. Worked for several international companies including Knight P

Registrations or Certifications: Professional Engineer

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Session ID: EngTPM06 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Permitting, Design, Technology and Construction of a Micro Hydropower Facility for the City of Beaverton

Abstract: The City of Beaverton is currently designing a new booster pump station that will also house hydropower turbine equipment to generate energy from an incoming high pressure forcemain. The City has been carefully working with the Energy Trust of Oregon (ETO) for project assistance and development funding. Presentation will include a summary of the hydropower potential at the project site, technology selection, how to coordinate with ETO, permitting, design, and construction.

CEU Relevance Statement: The presentation will summarize operational strategies for controlling the incoming water and how it works with the hydropower turbine. Flow and pressure not only vary seasonally, but daily, and hydropower equipment typically operate bests when flow/head are consistent. The City of Beaverton will utilize altitude valves when the flow/head fall outside this range. In summary, this presentation will review water system operation and control for hydropower equipment.

Author: Adam Odell **Author's Job Title:** Civil Engineer

Email: adam.odell@stantec.com **Phone:** 5032205409

Organization: Stantec Consulting

Primary Job Duties: I am the Design Manager for the project coordinating all discipline leads.

Related Prior Employment: 15 years, all with Stantec.

Registrations or Certifications: PE - Oregon

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Greater Tacoma Convention Center 1500 Commerce St., Tacoma, WA 98402

Session ID: CustEBT01 **Date:** 4/28/2022 **Length of Session:** 60 minutes

Area of Relevancy: Drinking Water

Presentation Title: Supporting the Customer Service Representative

Abstract: The presentation is an overview of a 2 day class that focuses on training the customer service representative how to understand and communicate with utility customers and staff in order to increase public trust and support. This one hour presentation will focus on the importance of the customer service representative having an understating of how the water system operates and functions.

CEU Relevance Statement: This course provides an overview of the water system and how it operates and functions it will proved the operator and the customer service agent with some basic knowledge as related to Consumer confidence reports, water use types water quality and distribution fundamentals.

Author: James Dean **Author's Job Title:** Utility Customer Service Manager

Email: james.dean@yakimawa.gov **Phone:** 5095766615

Organization: City of Yakima

Primary Job Duties: I am currently the Utility Customer Services Manager for the City of Yakima. This division is responsible for managing all utility accounts for the City including billing, collection, account set up, metering, meter reading and handling customer inquiries and complaints.

Related Prior Employment: I have been employed with the City of Yakima for 24 years and spent the first 16 years working directly in water operations. I served as the distribution supervisor for 8 years beforme moving to manager of the Utility Services Division.

Registrations or Certifications: Washington State Distribution Manager 3, Cross Connection Control, Certified trainer for the AWWA Customer Service Course

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Session ID: UMTAM01 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Surfing and Cresting (?) the "Silver Tsunami"

Abstract: Seattle Public Utilities, like many utilities, is experiencing a wave of retirements. This presentation will discuss some of the tools we're developing and using to attract talented new hires, to retain the dedicated staff we already have, and to improve succession planning efforts. Tools we'll discuss include: hiring with added emphasis on transparency and diversity; developing talent through programs like our apprenticeship program; career development tools for staff; and enhancing written protocols as a tool for passing knowledge from generation to generation.

CEU Relevance Statement: This presentation is relevant to the O&M and management of a water system. Without tools for managing staff transitions, the basic operations and maintenance of a water system can be jeopardized. Good planning efforts are critical to ensuring both daily operations and maintenance of a water system as well as a long-term sustainable path into the future.

Author: Alex Chen **Author's Job Title:** Branch Deputy Director, Drinking Water

Email: alex.chen@seattle.gov **Phone:** 2063353651

Organization: Seattle Public Utilities

Primary Job Duties: Manage the drinking water utility and utility-wide operations and maintenance. Major responsibilities include long term planning for the utility, CIP and O&M budget management, operations and maintenance of the reservoirs and rivers and wellfields used for water supply, and management of crews from "forest to tap" serving 1.5 million people.

Related Prior Employment: 1994-1998 Process Engineer, East Bay Municipal Utility District. 1998-2000 Project Manager, Black & Veatch. 2000-2005 Project Manager, Tetra Tech/KCM.

Registrations or Certifications: Professional Engineer, Washington. Water Treatment Plant Operator IV, Washington. Water Distribution Manager IV, Washington. MS Civil/Environmental Engineering

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Session ID: UMTAM02 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Development of a Drinking Water Internship Program (DRIP)

Abstract: There is a critical and unprecedented shortage of experienced staff in the water workforce. According to the EPA, this shortage will only worsen in the next ten years, as approximately 1/3 of water and wastewater operators will be eligible for retirement. This issue is compounded by fewer young people entering the field. The recent closure of a Water/WW Training Program will intensify the issue in the Pacific Northwest (PNW), and the fact that several new treatment plants will be coming online will only increase the need for water sector staff. This prompted several local utilities, consultants, and a community college to create a group to focus on solutions to this shortage with the goal of creating a more robust water workforce in the PNW. Strategies being developed include increasing awareness of water industry careers, boosting recruitment, and providing paid internships. We will discuss our actions to date, partnerships formed, grants applied for, and our plan moving forward.

CEU Relevance Statement: This presentation is extremely relevant to the operation and management of a water system. Development of an experienced workforce is critical to the successful operation of a drinking water or wastewater system. This presentation will describe the actions the DRIP group is taking to develop a larger water workforce in the Pacific Northwest.

Author: Chris Wilson **Author's Job Title:** Senior Program Manager

Email: Chris.Wilson@hillsboro-oregon.gov **Phone:** 503-615-6671

Organization: Joint Water Commission

Primary Job Duties: Chris Wilson oversees the Joint Water Commission (JWC) Water Treatment Plant, the largest conventional treatment plant in Oregon.

Related Prior Employment:

Registrations or Certifications: Certified Treatment Level 4 Drinking Water Operator

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Session ID: UMTAM03 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Both

Presentation Title: Condition Assessment Made Easy for Operations and Maintenance Personnel

Abstract: Condition assessment is the foundation to justify a budget and replacement plan. However, the term "Condition Assessment," can mean different things to different people. Sometimes, for management, it may mean spending unnecessary money. However, condition assessment should not be considered an overwhelming, laborious, or expensive task, but rather a simple, structured, logical, and step-by-step approach to determining the condition of a facility's infrastructure.

CEU Relevance Statement: This presentation will explain the five condition assessment levels associated with grading a water or wastewater facility's equipment. Level 1 and 2 assessments, which can be performed by trained in-house engineers, operators, and/or maintenance staff, will be described in further detail.

Author: John Koch **Author's Job Title:** Senior Project Manager

Email: John.Koch@hdrinc.com **Phone:** 425-773-1384

Organization: HDR, Inc.

Primary Job Duties: John serves as HDR's technical design and startup specialist for pumping and advanced treatment facilities. He specializes in design of large capacity pump/lift stations and is HDR's primary technical expert for resolving mechanical, controls, and hydraulic issues with pumping facilities. John also serves as primary commissioning and startup lead for HDR's membrane water and wastewater treatment facilities.

Related Prior Employment: 53 years industry experience/34 years with HDR

Registrations or Certifications: PE in WA, OR, IN; Board Certified Environmental Engineer; Construction Document Technologist

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Session ID: UMTAM04 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Both

Presentation Title: Unleashing the Power of Technology for Effective Communication and Organization

Abstract: Technology is a powerful tool that can be used to aid in organization and communication. The need for effective communication and organization grows as retiree roles are filled by younger generations. In today's society where information is shared quickly, clear and concise public outreach is essential to maintain trust. Shared folders, project management applications, curated templates, and social media applications can be used to both improve the organization of ideas and enhance the productivity of communication.

CEU Relevance Statement: Using technology to aid organization and communication for water system operation and maintenance staff, engineers, and public officials is crucial as younger generations start to fill the role for retirees. Much of the critical knowledge can easily leave with the retiree. Technology can be used to help document system operations and maintenance in an intuitive manner to help ease the transition of roles, thus ensuring stability in water system and treatment plant operations during staffing transitions, and facilitating the location of critical information during emergency response . Technology can also be used to help engage the public by using websites or social media platforms to communicate important ideas and urgent announcements.

Author: Laura Oxsen **Author's Job Title:** Civil Engineering Lead

Email: laura.oxsen@3j-consulting.com **Phone:** 5038193028

Organization: 3J Consulting, Inc.

Primary Job Duties: I am a Civil Engineer at 3J Consulting responsible for designing and overseeing the design of my team for both public works and private development projects. In addition to design work, I coordinate with jurisdictions, clients, sub-consults, and contractors to ensure a successful project. My main areas of focus have been water distribution line design, K-12 schools, and commercial/residential development.

Related Prior Employment: I am a registered PE with 5.5 years of experience in the industry. I've been with 3J Consulting for the past 5 years and I was previously employed by the City of Gresham Wastewater Engineering Division and AECOM Water Infrastructure Group. I have been an

Registrations or Certifications: Civil Engineer, PE in the State of Oregon

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Session ID: UMTAM05 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Both

Presentation Title: The Value of Connection

Abstract: COVID-19, a historic ice storm, wildfires, power outages, legionella, chlorine shortage, drought, and more, have all challenged water providers over the last year and a half. This presentation will focus on the role the Regional Water Providers Consortium played in helping its 24 water provider members successfully navigate these challenges and the importance of regional collaboration in mitigating risk and building resilience. Learn how water providers worked together to minimize impacts to water systems and customers by using regional messaging campaigns, system interconnections, established networks and other regional tools and resources.

CEU Relevance Statement: The presentation will focus on tools and strategies to improve management of water and wastewater systems by learning about the importance of partnerships, collaboration and planning.

Author: Rebecca Geisen **Author's Job Title:** Managing Director

Email: rebecca.geisen@portlandoregon.gov **Phone:** 503-823-7493

Organization: Regional Water Providers Consortium

Primary Job Duties: Managing Director of the Regional Water Providers Consortium, responsible for management of organization, implementation of strategic goals and programs including regional coordination, emergency preparedness and water conservation. Manage staff of four and budget of $1,000,000. Serve most water providers in the Portland metro area.

Related Prior Employment: I have been with the Regional Water Providers Consortium and Portland Water Bureau for 22 years serving as the Managing Director of the Consortium and Groundwater Protection Manager for the Portland Water Bureau. Prior to that, I was a resource management

Registrations or Certifications: N/A

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Session ID: UMTAM06 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Both

Presentation Title: Engaging O&M Staff to Improve the Design of the Bull Run Filtration Facility

Abstract: The presentation will be based on the Bull Run FF O&M staff engagement plan, and will track these efforts through planning, pre-design, and design. The engagement plan is designed to include utility operation and maintenance personnel in key meetings, provides opportunities for design review and comment, and key roles in maintenance of operations planning. The listener will take away strategies for engaging O&M personnel in their facility design efforts (for engineers), and strategies for providing useful contribution to design efforts (for operators and maintenance personnel).

CEU Relevance Statement: The presentation provides current, relevant information on how project design can be improved with input from utility operations and maintenance professionals. The skills promoted include review of facility drawings and specifications, operability and maintainability reviews, hazard assessment methods, maintenance of operations planning during design, and facility operational efficiency (from the operator's point of view).

Author: Willis Carr **Author's Job Title:** Senior Operations Specialist

Email: wcarr@carollo.com **Phone:** 12089126865

Organization: Carollo Engineers

Primary Job Duties: Assist engineers and utilities with facility design and operations planning , design and construction. Respond to emergency and routine plant and facility assistance requests, perform evaluations to improve existing processes, and make recommendations for capital (longer term) improvements.

Related Prior Employment: Water Treatment and Water Distribution operator. Extensive experience with O&M of large municipal WTPs and distribution systems, including: Conventional, Microfiltration , Reverse Osmosis, Softening, and DE surface water treatment. GAC & Greensand wellhea

Registrations or Certifications: ABC C2EP, Class IV Professional Operator, Treatment and Distribution; Idaho Class IV Water Treatment and Distribution; Oregon Class IV Water Treatment; California Treatment Operator - T3

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Session ID: UMTPM01 **Date:** 4/28/2022 **Length of Session:** 60 minutes

Area of Relevancy: Drinking Water

Presentation Title: Facility Planning For More Than Capacity

Abstract: In 2021, City of Everett completed a Facility Plan for its Water Filtration Plant, which provides water supply to over 600,000 regional customers. This session will focus on the Facility Planning process, including assessment and prioritization of condition, resiliency, and capacity needs. It will describe how technical analyses were paired with operations staff knowledge and concerns to support informed decision making.

CEU Relevance Statement: Topic is relevant to maintaining water systems and managing O&M activities. Operations staff are critical participants in a facility planning process, and are key stakeholders that will either appreciate or have to live with the results. This session will provide insight for how to get the most out of the process. Also relevant for utility managers and engineers.

Author: Patrick Weber **Author's Job Title:** Project Manager

Email: pweber@brwncald.com **Phone:** 5098638631

Organization: Brown and Caldwell

Primary Job Duties: Patrick Weber is a civil engineer with Brown and Caldwell's Seattle office. He has 15 years of experience in drinking water, stormwater, and wastewater engineering. Patrick specializes in engineering planning and alternative delivery Owner Advisor services for public utility clients.

Related Prior Employment:

Registrations or Certifications: P.E., PMP

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Session ID: UMTPM02 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Minimizing Apparent Losses: City of Bend's Analytical Approach to Revenue Recovery Through Prioritized Meter Testing and Replacement

Abstract: In this presentation, speakers will discuss how the City of Bend applied a near real-time apparent loss software tool that uses a "bottoms up" method to identify meters that are under performing due to degradation, not linked to weather or conservation trends. This technology allowed the City to prioritize their meter replacement program based on revenue lost/meter/month, optimizing their limited operational resources to recover maximum revenue. Participants in this session will learn how to detect apparent losses and adopt new forms of reducing apparent loss that complement the AWWA standards on Apparent Losses and Water Loss Reduction Planning. Results of this tool and programmatic approach to apparent loss resolution are being embraced as a better practice, producing energy savings, and top-line revenue delivered to water utilities.

CEU Relevance Statement: This presentation will help utility management leaders understand how to identify, pilot, and implement new technologies in the marketplace. The ease of implementation and roll out will be discusses as well as field work and testing needs that are required to produce the revenue savings.

Author: Spencer Cashwell **Author's Job Title:** Sr. Program Technician

Email: scashwell@bendoregon.gov **Phone:** 541-408-5520

Organization: City of Bend OR

Primary Job Duties: Spencer is the program technician that has the primary function of managing their Aclara AMI solution and WaterSmart customer portal. Spencer also manages their customer side leak detection program that focuses on customer service and early detection to aid in cost savings, property preservation and conservation efforts on the customer side of the meter.

Related Prior Employment: Spencer has over 24 years in the utility industry with the City of Bend. In the past 15 years his focus has been on AMR/AMI metering, customer side leak detection, customer facing portal, meter testing and customer service.

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Session ID: UMTPM03 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Both

Presentation Title: Fear, Uncertainty, and Doubt with Cybersecurity

Abstract: Fear, Uncertainty, and Doubt (FUD) fills the gap between capabilities of internet bad-actors and Owner's knowledge of Cybersecurity. Proper defense requires processes, procedures, and design beyond specialty software and hardware. Software or hardware security appliances rely on the Owner; the reverse is not always true. This presentation will discuss the limitations and vulnerabilities of common web/cloud-based applications used by water utilities for a wide range of sensitive and critical functions that includes operational control, personal data storage, and accounting and invoicing.

CEU Relevance Statement: The internet enables water utility operators, managers, and administrators to extend their reaches. Every advantage or feature of the internet connected systems and technology may be used by internet bad actors. Fear, Uncertainty, and Doubt (FUD) is used to sell hardware and software services which may not be appropriate. Risk and Resilience Assessments (RRAs) may expose areas where we can all improve; we all need to improve. This presentation is targeted to Management, Maintenance, and Operations for utility systems. Particular emphasis will be given to what risks compared to recent reported attacks.

Author: Nate Palmatier **Author's Job Title:** Sr. Electrical Engineer

Email: Nathanael.Palmatier@bhcconsultants.com **Phone:** 5093888347

Organization: BHC Consultants, LLC

Primary Job Duties: I design control, instrumentation, communication distribution, and power distribution systems for water and wastewater utilities. Modern designs and risk analysis include consideration of the control and instrumentation systems vulnerabilities when connected to public and private networks.

Related Prior Employment: Previous employment included system integration for water and wastewater including early integration of Ethernet networks in motor controls. Other facets included in-house IT and consulting.

Registrations or Certifications: Washington, Oregon, and Idaho Professional Engineer (Electrical and Control Systems); BICSI RCDD/NTS, (ISC)2 CISSP (Pending)

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Session ID: UMTPM04 **Date:** 4/28/2022 **Length of Session:** 60 minutes

Area of Relevancy: Both

Presentation Title: The Show Must Go On: Business Continuity and Emergency Response

Abstract: Public Works Operations and Maintenance do not stop even in a pandemic or during natural calamities or emergencies. There are established rules about the upkeep of the operations during any major events. This class covers normal disruptive events, plus deals with bigger showstoppers like the pandemic. The citizen and intra-organization interactions also become important as people may not meet physically due to the nature of the event. We will discuss business continuity and operations in an adaptive hybrid mode with a mix of online and in-person where what makes sense. The attendees will come out with a clear idea on how to deal such events in the future and operate in the new normal.

CEU Relevance Statement: We teach this class everywhere including rural water, special districts, city conferences in multiple states. We also teach multiple CEU driven classes on this topic year round with those organizations. Operators, Managers, Council and Board members learn the needs and wants of such system, and how these systems can help them do their job economically, efficiently, productively while meeting safety, regulatory and compliance requirements. This also helps secure more funds and grants, and direct those towards the service of the citizens.

Author: Arnab Bhowmick **Author's Job Title:** Founder and CEO

Email: ARNAB@AAKAVS.COM **Phone:** 4252453569

Organization: Aktivov Asset Management

Primary Job Duties: Arnab has more than 21+ years of technical and managerial experience in business and operations, asset maintenance and management, GIS, emergency management, IT security, strategic planning etc. He is currently the Chair of American Public Works Association (APWA) Asset Management Committee and has been advising the CxO level executives, City and District managers and department heads for couple decades on asset management, GIS and IT strategies, business continuity, technology trends, and e-governance.

Related Prior Employment: Arnab has worked for many corporations including Weston Solutions, ESRI, Tata Group, founded Aktivov Asset Management and Aakavs Consulting, and has a bachelors in Civil Engineering and masters in GIS/BIS and sustainable engineering technologies.

Registrations or Certifications: BE,MS,GISP,LEED AP

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Session ID: CompTPM01 **Date:** 4/28/2022 **Length of Session:** 60 minutes

Area of Relevancy: Both

Presentation Title: Top Ops

Abstract: Top Ops is the "college bowl" of the water industry. Teams of one, two or three operators from PNWS subsections compete against each other in a fast-paced question-and-answer tournament.

CEU Relevance Statement: Teams answer a broad range of technical questions covering topics such as water quality, distribution, treatment, and regulations. Winners may proceed to the national AWWA conference.

Author: Bill Reynolds **Author's Job Title:** Operations Manager

Email: breynolds@ci.tacoma.wa.us **Phone:** not sure

Organization: Tacoma Water

Primary Job Duties: Manage water operations at Tacoma Water

Related Prior Employment:

Registrations or Certifications:

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Session ID: CompTPM02 **Date:** 4/28/2022 **Length of Session:** 60 minutes

Area of Relevancy: Both

Presentation Title: Gimmicks and Gadgets

Abstract: Gimmicks & Gadgets is the competition where ideas are shared in a way to help and improve operator's work in the field. Most innovations include the use of simple items that can be used every day in the field.

CEU Relevance Statement: Each contestant will present their innovation and describe how it assists them, improving their work, making them more efficient and effective in completing their work tasks in their respective systems. Entries in this competition have competed at a local level. Winners proceed to the national AWWA competition.

Author: Micheal McClenathan **Author's Job Title:** Water Division Supervisor

Email: Mike.McClenathan@centralpointoregon.gov **Phone:** 541-890-0801

Organization: City of Central Point

Primary Job Duties: Mr. McClenathan is currently the Water Division Supervisor for the City of Central Point in southern Oregon. He is responsible for the day-to-day operation and maintenance of the distribution and SCADA system, water quality, cross-connection program and customer service.

Related Prior Employment: Mr. McClenathan has worked for Central Point for over 15 years, beginning as a utility worker and holding numerous positions of progressive responsibility in that time.

Registrations or Certifications: Michael has a Professional Operator designation with a Class IV in Water Distribution. He is certified as a level 4 distribution operator and cross-connection specialist in OR and a WDM 4 in WA.

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Session ID: CompTPM03 **Date:** 4/28/2022 **Length of Session:** 60 minutes

Area of Relevancy: Drinking Water

Presentation Title: Fresh Ideas Poster Contest

Abstract: The Fresh Ideas Poster Contest is open to all college students to compete.

CEU Relevance Statement: Student posters will be judged on 4 criteria: technical content, benefit to the drinking water industry, oral presentation of the poster, and organization and presentation of the poster.

Author: Annabel Warnell **Author's Job Title:**

Email: awarnell@landauinc.com **Phone:**

Organization:

Primary Job Duties: N/A

Related Prior Employment: N/A

Registrations or Certifications: N/A

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Session ID: WQTAM01 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Developing an Algal Bloom Management and Response Plan

Abstract: Harmful algal blooms (HABs) are a potential source of contamination for surface water sources. Toxins produced by cyanobacteria found in source water or released from cyanobacterial cells through treatment processes can harm people and animals. In addition to potential public health risks of cyanobacteria, any source water algal bloom can cause increased filter loading and shorter filter run times, reduced treatment plant capacity, taste, odor, and color problems in finished water, and loss of consumer confidence in the quality of drinking water. Systems can prepare for and mitigate these events by proactive planning and active source management. This presentation is a case study on using Washington guidance, Dealing with Algal Blooms: Time to Make a Plan (331-654) to develop a plan.

CEU Relevance Statement: This presentation covers an issue that is critical for operation and management of water systems that are vulnerable to harmful algal blooms.

Author: Nancy Feagin **Author's Job Title:** Surface Water Program Engineer

Email: nancy.feagin@doh.wa.gov **Phone:** 2533956765

Organization: Washington State Department of Health

Primary Job Duties: For Washington State Department of Health, Oversee implementation of the Surface Water treatment rules in Washington, 6 years. Regional Engineer, 26 years

Related Prior Employment: Development Volunteer, Mennonite Central Committee. Civil Engineer, RW Beck and Associates

Registrations or Certifications: Washington Professional Engineer- Civil Engineering

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Session ID: WQTAM02 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Richland's Lessons Learned When Anatoxin-a Was Found in the Columbia River

Abstract: Dog deaths in the Columbia River prompted monitoring of water quality in the river near the Tri-Cities resulting in finding a cyanobacteria toxin present and closing beaches for recreational use in the fall of 2020. The Columbia River is the primary source of supply for four cities in the region with a population over 225,000. The water systems, along with DOH assistance, developed a monitoring plan for anatoxin-a (a contaminant with no federal or state health advisory level), optimized water treatment based on limited national research, and coordinated communication with the public. This presentation will cover lessons and learned and plans for the future.

CEU Relevance Statement: This presentation will cover lessons learned by the Tri-Cities water utilities during an HAB bloom in the Columbia River. We will discuss how the systems were monitored for anatoxin-a, treatment system adjustments, and lessons learned so we can be prepared for the next year.

Author: Pat Everham **Author's Job Title:** City of Richland Water Manager

Email: teverham@CI.RICHLAND.WA.US **Phone:** 509-942-7472

Organization: City of Richland

Primary Job Duties: Water Manager for the City of Richland's water system. The City has a 24,000 gallon per minute surface water treatment plant and two ground water sources serving a community water system of approximately 58,000 people .

Related Prior Employment:

Registrations or Certifications: Water Treatment Plant Operation 4, Water Distribution Manager 4, & Cross-connection Control Specialists

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Session ID: WQTAM03 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Evaluating Options for Taste and Odor Problems (Umpqua Indian Utility Coop)

Abstract: The Umpqua Indian Utility Cooperative's (UIUC's) water treatment plant in Canyonville, OR has experienced increasingly exacerbated seasonal Taste and Odor (T&O) issues resulting from algal blooms in its raw water reservoir. The project team evaluated solutions based on their efficacy, costs, affects to operation, and secondary benefits to the water treatment train. This exercise led to the selection of three solutions that provide a multiple-barrier approach to prevent T&O compounds from reaching the finished water: hypolimnetic oxygenation (algae bloom prevention), ozonation (T&O destruction), and granular activated carbon post-filtration contactors (T&O removal). This presentation will highlight the relevance and difficulty of T&O removal and summarize the evaluation process, treatment technologies considered, selection of preferred treatment technologies, and potentially some initial performance outcomes of the newly installed treatment technologies.

CEU Relevance Statement: The presentation will help utilities who are experiencing algae blooms and/or T&O issues understand the various challenges to successfully remove T&O compounds, evaluate different technologies and identify solutions that are appropriate for their water treatment system. If applicable, the presentation may also assist operators in influencing water quality by understanding how operational factors may affect T&O removal.

Author: Daniel Mosiman **Author's Job Title:** Engineer Designer

Email: Daniel.mosiman@murraysmith.us **Phone:** (630) 957-8604

Organization: Murraysmith

Primary Job Duties: As a staff engineering designer at Murraysmith, Daniel assists in the design and construction support of drinking water treatment systems for municipalities.

Related Prior Employment:

Registrations or Certifications:

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Session ID: WQTAM04 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: City of Salem - Geren Island WTP Improvements Project Update

Abstract: In 2018, the City of Salem's Geren Island WTP experienced a spike in cyanotoxins in the raw water, leading to development of short- and long-term treatment options. The selected long-term approach included a new ozone treatment facility with an implementation target of two years from start of design to commissioning. To meet the aggressive schedule, the project was delivered using the Construction Manager / General Contractor (CM/GC) approach with multiple early work packages issued prior to final GMP. In spite of a worldwide pandemic, major wildfires in the watershed and a historic ice storm, the project was commissioned in the summer of 2021. This presentation will provide a project update, and highlight key lessons learned, beginning with the historic emergency response in 2018, to the start-up, commissioning and operations of the expanded WTP.

CEU Relevance Statement: This presentation will provide information to utility staff and consulting engineers on the rapid design and construction of critical infrastructure, delivered in partnership between the City, contractor and engineer and will include lessons learned in dealing with historic challenges experienced during construction of major wet infrastructure projects.

Author: John Kenedy **Author's Job Title:** Project Manager

Email: JKennedy@cityofsalem.net **Phone:** 503-434-3681

Organization: City of Salem

Primary Job Duties: Project Manager for the City of Salem's Geren Island WTP Improvements Project.

Related Prior Employment: Over 30 years of public service for utilities in Oregon and beyond, including serving as City Engineer, in addition to Consulting services that includes managing one of the nation's largest, and most complex infrastructure projects, DC Water's $2.6B Clean

Registrations or Certifications: PE - Oregon

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2022 Annual Conference, Tacoma, WA April 27 – 29

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Session ID: WQTAM05 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Salem's Cyanotoxin Response – A Success Story

Abstract: The City of Salem's response to the 2018 cyanotoxin event in the North Santiam River included fast tracking an immediate response plan with parallel planning for a long-term treatment solution for meeting current and future needs. The City's foresight in selecting ozone as the long-term process for treating cyanotoxins has provided an excellent tool for dealing with the known threats of future algal toxin events, but other potential water quality issues, such as water quality affected by recent fires (which burned over 50% of the watershed) and ice storms in the watershed. This presentation will focus on the resilience of the improved Geren Island WTP, including additional roughing filter capacity (for elevated turbidity and filter clogging algae removal), intermediate ozonation (for elevated TOC and T&O) and additional groundwater development (for an alternative supply to surface water).

CEU Relevance Statement: Water treatment professionals from all areas of the industry will find this presentation informative in dealing with treatment of cyanotoxins, while also planning for, and ultimately treating future water quality events.

Author: Nicole Williams **Author's Job Title:** Lead Engineer

Email: NWilliams@carollo.com **Phone:** 614-202-1184

Organization: Carollo Engineers

Primary Job Duties: Nicole serves as a Lead Engineer for Carollo Engineers, supporting research and design projects in the PNW. She currently serves as the Resident Engineer during construction of the Geren Island WTP Improvements Project.

Related Prior Employment: Nicole has worked with Carollo Engineers for her entire 8 year career.

Registrations or Certifications: PE

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Session ID: WQTAM06 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Creating a Crystal Ball: The Future of Harmful Algal Bloom Forecasting Using Artificial Intelligence

Abstract: Since the summer of 2018 when harmful algal blooms (HABs) in Detroit Lake contaminated the City of Salem, Oregon's drinking water supply for the first time, causing toxin levels in excess of EPA guidelines for safe consumption by at-risk populations, The Prediction Lab (TPL) has been working with the City to use artificial intelligence to produce 7-day HAB forecasts for the lake. Now TPL and Carollo are teaming with the Water Research Foundation and 30 utilities throughout the pacific northwest and across the country to use transfer learning to develop HABs forecasts for a diverse set of water bodies. The ultimate product of this project will be an interactive web and mobile application for HAB risk assessment.

CEU Relevance Statement: As harmful algal blooms (HABs) appear in more and more water bodies, they are negatively impacting the operation, maintenance and management of water systems. All utilities that rely on raw water coming from lakes and reservoirs should be aware of the tools available to mitigate the risk posed by HABs. The tools discussed in this presentation help managers and operators predict HABs and change their operations to address the challenge.

Author: Alena Thurman **Author's Job Title:** Senior Engineer

Email: athurman@carollo.com **Phone:** 4252142968

Organization: Carollo Engineers

Primary Job Duties: I am Carollo's Pacific Northwest planning lead. As such I consult with drinking water utilities on challenges related to master planning. For the last two years I have been coordinating efforts to progress HAB forecasting tools.

Related Prior Employment: None.

Registrations or Certifications: Professional Engineer in WA, OR, CA.

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Session ID: ResWQTAM01 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: UVLEDs: From the Plant to the Pipe

Abstract: UVLED technology has previously been limited to point-of-use (POU) and point-of-entry (POE) decentralized water treatment applications. However, recent reactor design advancements have propelled the technology into the centralized treatment arena. This presentation will discuss the current state of UVLEDs as both a novel centralized treatment option for disinfection and advanced treatment in addition to a well-established POU/POE decentralized treatment option. The presentation will also examine the use of chemical oxidants to meet disinfection residual requirements for water distribution systems in the United States and discuss if non-chemical methods (like UVLEDs) may promote more safe and long-lasting water distribution solutions.

CEU Relevance Statement: This presentation will describe the similarities and differences in O&M requirements for a LED-based versus a mercury-based UV system. Water operators will be able to use this information to gauge the applicability of UVLED technology for their facilities and the corresponding water quality expectations with relation to public health. Topics will include instrumentation, duty/standby reactors, and validation details for both centralized and decentralized UVLED reactors.

Author: Tara Randall **Author's Job Title:** Water/Wastewater Engineer

Email: tara.randall@hdrinc.com **Phone:** 5309061791

Organization: HDR, Inc.

Primary Job Duties: My responsibilities as a water/wastewater engineer include the study, design, and construction oversight for water and wastewater projects across North America. I consult clients on water treatment plant process design and operations, laboratory analytics, water quality management, and regulatory compliance.

Related Prior Employment: My environmental engineering career began as a public servant with the California Department of Water Resources and more recently extended into the international development sector with Water for People in Uganda. My technical background is in UVLED tech

Registrations or Certifications: EIT, CA, #171256

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Session ID: ResWQTAM02 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: The Impact of Bromide on Chlorine Decay and Disinfection Byproduct Formation

Abstract: Utilities may use monochloramine instead of free chlorine in the distribution system to manage disinfection byproduct (DBP) formation associated with high bromide levels. However, forming monochloramine in water containing bromide can generate bromamines that catalyze monochloramine decomposition and could increase DBP yields. Here, TTHM and HAA9 formation as well as total chlorine and monochloramine stability were examined in groundwater containing 300-1,700 µg/L of bromide. This study demonstrated that simply adding ammonia prior to chlorine to form monochloramine can avoid bromamine formation thereby improving chlorine stability and decreasing DBP formation.

CEU Relevance Statement: his presentation is targeted towards engineers and water quality specialists. Water treatment plant operators who understand these relationships can use them to predict and monitor their plant performance in real time, allowing them to adjust treatment processes as needed to control DPBs.

Author: Kyle Shimabuku **Author's Job Title:** Assistant Professor

Email: shimabuku@gonzaga.edu **Phone:** 8054154548

Organization: Gonzaga University

Primary Job Duties: Teaching courses and performing research in drinking water and wastewater treatment. Focus area is in physical chemical treatment processes and distribution system water quality.

Related Prior Employment: Previously, I worked for Corona Environmental Consulting, LLC as a water process engineer. My projects focussed on groundwater treatment processes mainly to control inorganic contaminants such as ammonia, hexavalent chromium, and manganese. I also worked

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Session ID: ResWQTAM03 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Optimization of Distribution System Chlorine Residuals Through Chlorine Decay Tests and Hydraulic Modeling

Abstract: Silver Lake Water and Wastewater District, a utility serving approximately 54,000 people had concerns about their distribution chlorine residual levels. This study provided a comprehensive look at the chlorine residual issues including bench-top chlorine decay tests of the source water from their wholesale supplier, hydraulic modeling to establish water age throughout the distribution system, hydraulic characteristics and mixing within the four distribution system reservoirs, and general distribution system chlorine residual data. The analysis was completed for winter and summer conditions. The study determined that a combination of higher concentrations of chlorine reactive material in the source water and higher temperature combined to create more chlorine demand in the water in the summer. This coupled with long residence times in certain distribution system areas, as comfirmed by hydraulic modeling, lead to conditions conducive to low chlorine residuals.

CEU Relevance Statement: Operators can use this information to understand chlorine residual issues within distribution systems and what might contribute to low chlorine distribution residual values.

Author: Russell Porter **Author's Job Title:** Principal Engineer

Email: rporter@g-o.com **Phone:** 206 284-0860

Organization: Gray & Osborne, Inc.

Primary Job Duties: Russ Porter is the lead of Gray & Osborne's Water Group and manages projects related to all aspects of potable water engineering including water treatment and water quality.

Related Prior Employment: NA

Registrations or Certifications: AWWA (Past Engineering Committee Chair)

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Session ID: ResWQTAM04 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Evaluation of Pre-Oxidation and Secondary Disinfection Approaches on DBP Formation and Taste and Odor Using Simulated Distribution System Testing

Abstract: Portland is in the process of implementing filtration on its historically unfiltered Bull Run surface water supply. A two-year pilot study was recently completed to inform the design and operation of the new filtration plant. A series of simulated distribution system (SDS) tests were conducted to evaluate pre-oxidation approaches (pre-ozonation and pre-chlorination) and secondary disinfection methods (chloramines and free chlorine) on finished water quality, including disinfection byproduct formation, chlorine residual stability, microbial regrowth, and taste and odor. This presentation will step through the testing approach and summarize the findings.

CEU Relevance Statement: Drinking water treatment and distribution system operators will learn how treatment plant pre-oxidation and post-treatment disinfection methods can affect water quality, including its taste and odor, disinfection byproduct formation, and disinfectant residual stability. Operators will learn how to use simple bench testing and screening tools (simulated distribution system testing and flavor rating assessment) to evaluate alternative treatment approaches and inform treatment operational decisions.

Author: Anna Vosa **Author's Job Title:** Water Quality Engineer

Email: anna.vosa@portlandoregon.gov **Phone:** 9713229864

Organization: Portland Water Bureau

Primary Job Duties: Anna has worked as a Water Quality Engineer with the Portland Water Bureau for the past four years. She works as part of a team to ensure regulatory compliance and maintain water quality for the City's retail and wholesale customers. Over the past three years, she has also worked on the pilot study project team to inform the design and operation of the future Bull Run Filtration Facility.

Related Prior Employment: Prior to working with the Water Bureau, Anna worked as a consultant with Confluence Engineering Group and with HDR, and also worked for Washington DOH as a regional engineer. Anna's background includes project and program management, treatment plant desig

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Session ID: ResWQTAM05 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Optimizing Corrosion Control Treatment for Low-Alkalinity Source Waters

Abstract: A bench-scale immersion coupon study is currently being conducted to optimize lead and copper corrosion control treatment in the City of Boulder's (CO) water system. This study includes evaluation of four pH and alkalinity water quality conditions as well as two orthophosphate corrosion inhibitor doses for compliance with requirements in the Lead and Copper Rule Revisions. The results of this study will directly inform operations at the City's two treatment plants as well as predesign of improvements to disinfection and corrosion control treatment systems at the City's Betasso WTP.

CEU Relevance Statement: This presentation will cover all aspects of the corrosion control study, from study planning, execution, results, and recommendations. Guidance on developing corrosion control study test plans using lead carbonate chemistry will be presented. Findings from the corrosion control study will be presented in the context of low-alkalinity source water conditions, which are prevalent throughout the Pacific Northwest. Operators, engineers, and other water industry professionals who attend this presentation will leave with a through understanding of how to conduct similar studies for their own water system.

Author: Damon Roth **Author's Job Title:** Sr. Principal

Email: droth1@brwncald.com **Phone:** 5097704322

Organization: Brown and Caldwell

Primary Job Duties: Damon leads distributed teams of subject matter experts and engineers to provide solutions to municipal clients, particularly in areas related to drinking water system planning and treatment optimization, including treatment feasibility evaluations and corrosion control treatment.

Related Prior Employment: Damon previously worked for Cornwell Engineering Group, providing drinking water treatment process expertise to water systems throughout the United States.

Registrations or Certifications: PE, BCEE

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Session ID: ResWQTAM06 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Using Bench Scale Coupon Testing to Assess Lead Reduction Performance in Portland's Water Supply Across a Range of Coagulants and Corrosion Control Treatment Methods

Abstract: Portland is in the process of implementing filtration on its historically unfiltered Bull Run surface water supply. A corrosion control coupon study (CCCS) was completed to evaluate water quality impacts from filtration treatment and inform the design of corrosion control treatment (CCT). Using three types of metal coupons (pure lead, copper with lead-tin solder, and brass), the CCCS evaluated a matrix of CCT approaches, secondary disinfectants (free chlorine and chloramines), and coagulants. Results will be presented that show the benefits of filtration on lead reduction and demonstrate the importance of considering the type of coagulant when evaluating CCT methods.

CEU Relevance Statement: The results of the study show how decisions made regarding treatment plant operation can impact water quality in distribution systems, including lead and copper release in customer's homes, chlorine residual stability, and microbial regrowth. The presentation will show the value in using a simple corrosion coupon bench testing approach to screen coagulants used at filtration plants and various corrosion control methods to comprehensively evaluate impacts and benefits to public health, including lead reduction and microbial control in premise plumbing.

Author: Anna Vosa **Author's Job Title:** Water Quality Engineer

Email: anna.vosa@portlandoregon.gov **Phone:** 9713229864

Organization: Portland Water Bureau

Primary Job Duties: Anna has worked as a Water Quality Engineer with the Portland Water Bureau for the past four years. She works as part of a team to ensure regulatory compliance and maintain water quality for the City's retail and wholesale customers. Over the past three years, she has also worked on the Bull Run Filtration Project pilot study project team to inform the design of the future Bull Run Filtration Facility.

Related Prior Employment: Prior to working with the Water Bureau, Anna worked as a consultant with Confluence Engineering Group and with HDR, and also worked for Washington DOH as a regional engineer. Anna's background includes project and program management, treatment plant desig

Registrations or Certifications: Professional Engineer (Oregon) and Certified Water Right Examiner (Oregon)

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Session ID: RWQTTPM01 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Both

Presentation Title: Using UV and Fluorescence Spectroscopy to Monitor and Predict PFAS, MIB, and Emerging Contaminant Removal by Activated Carbon

Abstract: Powdered activated carbon (PAC) and granular activated carbon (GAC) can efficiently remove many organic contaminants including per-/poly-fluoroalkyl substances (PFAS), taste and odor causing compounds (e.g., MIB), and other emerging contaminants. However, the presence of organic matter can foul the adsorption capacity of carbonaceous adsorbents complicating the operation and maintenance of PAC and GAC systems. This presentation develops a low-cost, rapid approach to monitor and predict the performance of GAC and PAC to removed short-chain PFAS, MIB, sulfamethoxazole, and cyanotoxins based on UV- and fluorescence-based measurements of dissolved organic matter.

CEU Relevance Statement: This presentation is targeted towards engineers and water quality specialists. Water treatment plant operators who understand these relationships can use them to predict and monitor their plant performance in real time, allowing them to adjust treatment processes as needed.

Author: Kyle Shimabuku **Author's Job Title:** Assistant Professor

Email: shimabuku@gonzaga.edu **Phone:** 8054154548

Organization: Gonzaga University

Primary Job Duties: Teaching courses and performing research on drinking water and wastewater treatment. My focus area is in physical chemical treatment process and distribution system water quality.

Related Prior Employment: Previously, I worked for Corona Environmental Consulting, LLC as a water process engineer. My projects focused on groundwater treatment processes mainly to control inorganic contaminants such as ammonia, hexavalent chromium, and manganese. I also worked o

Registrations or Certifications: Professional Engineer

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Session ID: RWQTTPM02 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Collaborative Pilot-Scale Evaluation of GAC and IX Medias for Removal of PFAS from Groundwater

Abstract: A collaborative pilot-scale study of two granular activated carbons (GACs), bituminous and sub-bituminous, was conducted to compare GAC PFAS removal performance to two ion exchange (IX) medias, macro-type and gel-type. All medias had been previously demonstrated to offer reasonably favorable PFAS removal performance. Beyond a typical analysis, the PFAS concentrations were speciated to show the branched versus linear isomers, showing less selectivity of branched isomers by both GAC and IX. Several hypotheses are posed for this outcome and the impact of both the molecular size and polar/non-polar surface areas is discussed. Finally, the results were used to generate a cost comparison of medias to guide the future technology selection of the utility.

CEU Relevance Statement: In so far as an operator would be engaged in the operation and maintenance of pilot equipment, this presentation shows how to best configure a pilot system to match full-scale operation and the extent of monitoring and sampling collection that would be typically required. This presentation also addresses the expected frequency of media changeouts that a utility should expect and the degree to which operators would be expected to understand and support that process.

Author: Adam Redding **Author's Job Title:** Technical Director

Email: adam.redding@kuraray.com **Phone:** 4124177250

Organization: Calgon Carbon Corporation

Primary Job Duties: I direct the company's technical support with regards to the installation, operation, and maintenance of activated carbon adsorption systems. Included therein is prediction of activated carbon performance, system troubleshooting, and product development.

Related Prior Employment: I was the activated carbon expert for USFilter/Siemens/Evoqua Water Technologies since finishing graduate school in 2008. My graduate research focused on activated carbon production and prediction of performance when removing endocrine-disrupting compoun

Registrations or Certifications: EIT, Pennsylvania

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Session ID: RWQTTPM03 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: From Bench Test to Reality: Comparing Operations of Full-scale PFAS Treatment Facilities to Preliminary Bench Scale Test Results

Abstract: In recent years, PFAS have been increasingly detected in groundwater supplies across the US. With a rapidly changing regulatory landscape, many bench and pilot studies have been conducted seeking to understand the effectiveness of treatment media such as granular activated carbon (GAC) and ion exchange (IX). Now, with full-scale treatment systems coming online, data from operating facilities can be compared to results from bench studies and small diameter pilot columns. This presentation will compare data from two operational full-scale IX facilities to the predictive results of bench testing and explore lessons learned from design, start-up, and operations.

CEU Relevance Statement: This presentation focuses on the lessons learned from design, startup, and operation of full-scale PFAS treatment facilities. This information will be applicable to operators to help extend the longevity of treatment systems while maintaining high water quality. Managers and engineers will gain insight into factors impacting treatment technology selection.

Author: Stephen Timko **Author's Job Title:** Staff Scientist/Engineer

Email: stephentimko@kennedyjenks.com **Phone:** 2695986661

Organization: Kennedy Jenks Consultants

Primary Job Duties: Steve is a water quality specialist in the Applied Research Group at Kennedy Jenks, and focuses on the treatment of contaminants such as PFAS, VOCs, and arsenic. His project experience additionally spans potable reuse, water and wastewater treatment, and stormwater treatment and conveyance.

Related Prior Employment:

Registrations or Certifications:

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Session ID: RWQTTPM04 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: How Ion Exchange (IX) Shoehorns PFAS treatment into a Tight Site

Abstract: The City of Pico Rivera have constructed ion exchange (IX) treatment plant improvements at multiple well sites to address PFAS (per- and polyfluoroalkyl substances) groundwater contamination in their water supply wells. The presentation will review how IX was selected over granular activated carbon, details around testing and resin selection, and lessons learned.

CEU Relevance Statement: As an emerging contaminant with wide prevalence in the natural environment and in water supply resources, PFAS removal and treatment is a growing concern for engineers, operators, and public officials. This presentation discusses the significance, measurement, health-advisories, and regulatory framework relative to PFAS chemicals, and evolving approaches to protect public health and reduce exposure to PFAS through drinking water. In addition, it provides a case-study for the implementation of PFAS removal technologies and lessons learned.

Author: Esther Chang **Author's Job Title:** Water Engineer

Email: esther.chang@jacobs.com **Phone:** 2068616791

Organization: Jacobs

Primary Job Duties: Esther supports the process mechanical design for drinking water treatment projects from alternatives analysis to detailed design, services during construction, and commissioning and startup. This is her fourth PFAS related treatment project.

Related Prior Employment:

Registrations or Certifications:

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Session ID: RWQTTPM05 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: PFAS vs Lead and Copper Rule Compliance

Abstract: The City of Issaquah, Washington supplies water from four wells. One well already has granular activated carbon absorbers for PFAS removal. When a second well was determined to have increasing PFAS concentrations, the City decided to turn that well off. However, that second well was critical for providing high pH groundwater for corrosion control compliance. This presentation discusses the planning and implementation of extensive mitigation water system improvements that had occurred when the City wished to reduce PFAS exposure of its customers, but which would inadvertently cause other compliance issues.

CEU Relevance Statement: This presentation is a case study of how a utility had to implement extensive capital and operational mitigation measures when it responded to State requirements for reducing PFAS exposure but then ran into potential Lead and Copper Rule compliance issues.

Author: Beth Mende **Author's Job Title:** Water/Wastewater Engineer

Email: elizabeth.mende@hdrinc.com **Phone:** (909) 528-1002

Organization: HDR, Inc.

Primary Job Duties: Beth is a professional engineer with experience in surface water and groundwater treatment plant process design and operations, laboratory analytics, water quality management and regulatory compliance, and system piping and hydraulic designs.

Related Prior Employment:

Registrations or Certifications: Professional Engineer

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Session ID: RWQTTPM06 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Addressing Unforeseen Challenges with Spent Media Disposal: The City of Issaquah, WA Experience

Abstract: The City of Issaquah, Washington operates granular activated carbon (GAC) absorbers for PFAS removal at one of their well sites. During the first media change out, the spent media was stopped in transport due to detected radioactivity despite the groundwater having non-detectable radionuclide concentrations. This presentation will discuss the sampling and analysis of the City's existing PFAS-removing GAC media in order to determine how to manage the spent media in compliance with local, state, and federal solid waste disposal regulations.

CEU Relevance Statement: This presentation is a case study of how a utility operates their granular activated carbon system for PFAS removal and how residuals management is handled. This presentation will discuss methods of disposal of PFAS residuals management in addition to other issues to be aware of when operating these systems.

Author: Beth Mende **Author's Job Title:** Water/Wastewater Engineer

Email: elizabeth.mende@hdrinc.com **Phone:** (909) 528-1002

Organization: HDR, Inc.

Primary Job Duties: Beth is a water/wastewater engineer with experience with surface water and groundwater treatment plant process design and operations, laboratory analytics, water quality management and regulatory compliance, and system piping and hydraulic designs.

Related Prior Employment:

Registrations or Certifications: Professional Engineer

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Session ID: ConsTAM01 **Date:** 4/28/2022 **Length of Session:** 60 minutes

Area of Relevancy: Drinking Water

Presentation Title: How City of Spokane is Making Water Efficiency as Routine as Recycling

Abstract: This presentation will cover lessons learned from the Spokane Commercial Water Efficiency Program and demonstrate how a shift in focus toward integrating water efficiency routines and reporting into normal operations improved efficiency on a daily basis. The focus is on operationalizing routines to the point they are a reflex, radically simplifying the integration of advanced efficiency initiatives like advanced measurement and reporting.

CEU Relevance Statement: System managers will learn how to establish procedures that make it easier to identify and eliminate inefficient water use, and facilitate compliance with water efficiency regulations.

Author: Annikki Chamberlin **Author's Job Title:** Owner

Email: annikki@mimirwater.com **Phone:** 928-910-0149

Organization: Mimir Water, Inc.

Primary Job Duties: President and Founding Director. Annikki has a long career implementing water efficiency programs for municipal water providers, industrial manufacturing facilities and commercial property operations. Her comprehensive skill set includes applied experience in Smart City applications, industrial process efficiency, reclaimed water reuse, technical water efficiency training, water resources management and planning, municipal water conservation, water quality, and wastewater treatment.

Related Prior Employment: Maddaus Water Management, Water Resource analyst

Registrations or Certifications: AWWA, AWE

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Session ID: ConsTAM02 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Water Curtailment Planning and Outreach – Approaches in Oregon

Abstract: Many municipal water providers in Oregon are required by the State to develop Water Management and Conservation Plans (WMCPs), which must include a water curtailment plan. The selection of initiating conditions (i.e. triggers) and water use curtailment actions for different stages of water curtailment will be discussed, as well as community outreach approaches. Examples throughout Oregon will be provided.

CEU Relevance Statement: This presentation will describe Oregon Water Resources Department requirements for the water curtailment section of Municipal Water Management and Conservation Plans (WMCP) and provide examples of how municipal water providers of different sizes and different geographic regions of Oregon are meeting those requirements. Municipal water system managers can use this information to enhance their water curtailment plans and to improve community outreach.

Author: Suzanne de Szoeke **Author's Job Title:** Water Resources Consultant

Email: sdeszoeke@gsiws.com **Phone:** 541-224-4588

Organization: GSI Water Solutions, Inc.

Primary Job Duties: Suzanne has 12 years of experience specializing in watershed management and planning. Her primary job responsibilities includes water management and conservation plan (WMCP) development, water conservation program development and support, and source water protection planning. She has experience working with state and federal agencies, irrigation districts, water providers, watershed councils, and landowners.

Related Prior Employment: Suzanne worked for the Deschutes River Conservancy in Bend, OR for 2 years before graduate school. For her doctoral research, Suzanne investigated how changes in streamflow and streamside vegetation cover caused by irrigation canals affected tropical dry

Registrations or Certifications:

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2022 Annual Conference, Tacoma, WA April 27 – 29

Greater Tacoma Convention Center 1500 Commerce St., Tacoma, WA 98402

Session ID: ConsTAM03 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: The Whole Conservation Picture: Tracking and Reporting Multiple Programs

Abstract: Conservation programs be very wide-ranging, including rebates, incentives, giveaways, education, outreach, audits, and more. Trying to paint a single picture that knits together all these efforts can be difficult. During this presentation, we will give an introduction to the ways that Tacoma Water uses SmartSheet and Tableau to consolidate our conservation efforts into a single dashboard. Once all the information is together, it can be used to analyze both the efficacy and equity of the programs delivered and gives insight to guide future work.

CEU Relevance Statement: When doing required conservation work for a water system, it can be difficult to measure the impact of different efforts. Doing some simple program tracking can help pull disparate programs into a single story, making it easier to see impacts and report results to stakeholders. Furthermore, program staff can also use the collected data to help them make decisions about the growth or change of programs as time goes on, noting which programs are most effective at reducing water use and complying with state water efficiency regulations.

Author: Rochelle Gandour-Rood **Author's Job Title:** Water Program Specialist

Email: rgrood@cityoftacoma.org **Phone:** 253-244-1073

Organization: Tacoma Water

Primary Job Duties: As a Water Program Specialist for Community Engagement and Conservation, my job at Tacoma Water is to both run our conservation programs (rebates, giveaways, one-on-one education, water audits) and also conduct outreach and education activities that promote a broader understanding of our water system. I work across ages and sectors, and serve both residential and commercial customers, and offer education to both children and adults.

Related Prior Employment: My career has always been focused on environmental education. In the formal education system, I was a middle school science teacher and also worked for the Washington State Superintendent of Public Instruction as the Environmental and Sustainability Prog

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Session ID: ConsTAM04 **Date:** 4/28/2022 **Length of Session:** 60 minutes

Area of Relevancy: Drinking Water

Presentation Title: How to Conserve Water with Electronic Control Valves and Active Pressure Managment

Abstract: Learn how to conserve water by utilizing electronic controls on pressure control valves and implementing active pressure management. Every leak is a product of the size of the hole and the pressure in the line. Minimize non-revenue water loss with electronic control valves that reduce line pressures when not needed and raise pressures when required based upon flow demand, time of day, season, and/or critical points in the system.

CEU Relevance Statement: Water systems across the world use control valves to control for pressures, flows, pump surge, and reservoir levels. This class will show operators how those control valves can be modified with electronic controls to practice active pressure management and conserve water. The class will also discuss how those valves work, so operators will be familiar with operation, installation, and maintenance of electronic and hybrid electronic hydraulic control valves in their system.

Author: Robert Velasquez **Author's Job Title:** Water Management Consultant

Email: robert@cimco-gcsystems.com **Phone:** 2533539620

Organization: Cimco-GC Systems

Primary Job Duties: My primary responsibility is working with engineers and operators in Washington, Oregon, Idaho, and Alaska in the selection and design of speciality valves such as Cla-Val control Valves and Val-matic air valves. in addition, I provide product training and education at engineer offices, water and irrigation districts, and water associations organizations, as well as over the phone and on-site troubleshooting and maintenance support.

Related Prior Employment:

Registrations or Certifications:

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Session ID: TreatTPM01 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Managing a Diverse, High-Performance Team for Portland's Bull Run Filtration Project

Abstract: The Portland Water Bureau is developing a new water filtration facility to help the City secure a safe and abundant water supply for the future. The Facility is the largest capital project ever undertaken by the City, and its success depends on the effective integration of City staff, management and engineering consultants, and contractors, with emphasis placed on diversity, inclusion, and equity at all levels. This presentation will provide an overview of the organizational structures, management procedures, and software tools used to deliver the design and construction of this critical infrastructure project. The audience will learn about the advantages of these approaches, key features, and how they may be applied to other projects. The audience will also hear about how these tools were implemented for many sub-consultants of varying sizes and backgrounds.

CEU Relevance Statement: This presentation will provide a look at how modern project management tools can be applied to successfully deliver large infrastructure project with a diverse team of many different firms. Tools include Primavera P6 and several excel formulated workbooks for tracking budget, D/M/W/ESB sub-consultant participation, and other activities. Engineers, CIP project managers, and utility managers will learn about tools and approaches for managing large multi-consultant projects.

Author: Josh Miner **Author's Job Title:** Lead Engineer

Email: jminer@carollo.com **Phone:** 503-830-4900

Organization: Carollo Engineers

Primary Job Duties: Job responsibilities include EOR for several ongoing treatment plant construction projects in the PNW, area lead for ongoing design projects specializing in residuals and solids handling, and assistant project manager roles on those project monitoring budget and overall project health.

Related Prior Employment: Josh Miner has been with Carollo engineers since he was hired as a junior engineer in the Portland office in 2013.

Registrations or Certifications: Oregon PE

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Session ID: TreatTPM02 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Bull Run Filtration Project: 60% Design Update

Abstract: The Portland Water Bureau is developing a green-field 135 mgd drinking water filtration facility to comply with state and federal safe drinking water regulations. This presentation will provide an overview of the Project's 60% design phase and will include: the advancement of disciplines for the selected processes/technology and site layout, the selection and development of early procurement packages, the coordination with outside agencies, the land use application process, and the use of value engineering to adapt the project to meet budgetary constraints. The presentation will conclude with how the Project is advancing into 90% design.

CEU Relevance Statement: This presentation is relevant to the operation, maintenance, and management of a water system because we will present how different disciplines (like electrical, I&C, and process mechanical) work together for a coordinated design that will lead to a fully-functional filtration facility that produces the target water quality, is easy to maintain, and will meet level of service goals related to local events like power outages and adverse weather. Operators will see how a facility is designed and understand how the design details are advanced from 30 to 60%.

Author: Lyda Hakes **Author's Job Title:** Engineer III

Email: lyda.hakes@portlandoregon.gov **Phone:** 6509063553

Organization: Portland Water Bureau

Primary Job Duties: Project Manager for the Filtration Facility Design. I am responsible for leading decision-making meetings and workshops for all aspects of the facility's design, coordinating with outside agencies for relevant approvals, and reviewing all design submittals.

Related Prior Employment: I was an environmental engineer in the Alameda County Water District's O&M Department for 9 years and focused on process control and drinking water compliance for a 28-mgd surface water treatment plant.

Registrations or Certifications: PE, civil (OR, CA). T2/D2 (CA).

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Session ID: TreatTPM03 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: What's Next? Planning the Future of Clackamas River Water's WTP

Abstract: Clackamas River Water maintains and operates a (nominally) 30 mgd water treatment plant (WTP) which supplies water to unincorporated Clackamas County and small portions of the cities of Oregon City, Milwaukie, and Happy Valley. The WTP, the core of which was originally constructed in the 1940s, has been well-maintained, but has components approaching the end of their useful life. In addition, an examination of WTP performance showed that nameplate capacities were not achievable. Through a facility planning effort, CRW explored options that varied the level of investment in existing infrastructure and developed a strategy to coordinate distribution system capital improvement needs with WTP needs.

CEU Relevance Statement: As WTPs age, those operating and maintaining them are faced with the challenge of deciding how much to invest in older infrastructure to repair it and when its necessary to replace. In addition, providers need to balance the amount of capital invested at the WTP with other improvements needed in the distribution system. This presentation will describe how CRW considered these challenges and developed a strategy to continue to provide high quality water to their customers.

Author: Ali Leeds **Author's Job Title:** Engineer

Email: aleeds@carollo.com **Phone:** 2066616324

Organization: Carollo Engineers

Primary Job Duties: I have 14 years of experience specializing in planning and design of drinking water treatment plants. I specialize in pretreatment and chemical systems and oversee junior staff in design.

Related Prior Employment:

Registrations or Certifications: PE in WA and OR

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Session ID: TreatTPM04 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Prioritization Matters – How Aging Infrastructure, Treatment Needs, and Site Layout Inform the Butterfield WTP's Expansion

Abstract: The City of Pasco's Butterfield Water Treatment Plant was constructed in 1949 and has undergone more than three major upgrade, expansion, and improvement projects since construction. Rapidly increasing water demands, caused by a growing population and an increase in industrial uses, prompted the City to conduct a master plan with the following goals: achieve the nameplate capacity from the WTP, prioritize facility improvements, and develop a roadmap for future capital projects. Achieving these goals required a detailed planning analysis into treatment options that coordinated with the existing facility and met future needs, all while bringing the best value to the City. The presentation will describe the assessment efforts and risk prioritization for the existing facility and will discuss the analysis used in comparing the alternatives.

CEU Relevance Statement: This presentation will describe the analysis for investigating future treatment operations, including capital and operational costs, for replacing aging infrastructure and explain how prioritizing different areas of the plant impacts the future plant layout. Furthermore, the presentation will discuss how anticipated degradation in raw water quality informs future treatment process selection.

Author: Brandon Dunagan **Author's Job Title:** Engineer

Email: thedunagan@gmail.com **Phone:** 9188330116

Organization: Carollo Engineers

Primary Job Duties: My responsibilities include the following: designing various unit process at water treatment facilities (focusing primarily on solids handling), developing master plans, conducting alternatives analyses, modeling plant hydraulics, and operating pilot studies.

Related Prior Employment: I've been employed with Carollo Engineers since graduating college in 2016.

Registrations or Certifications: I'm a professionally licensed engineer in the state of Oregon.

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Session ID: TreatTPM05 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Making the Most of Your WTP, Increasing Capacity and Reliability at the Medford Water Commission WTP

Abstract: The Medford Water Commission (MWC) Water Treatment Plant (WTP) is planning capital improvements to their WTP to increase capacity from 45 MGD to 65 MGD over the next several years. However, the WTP has seen sharp increases in demands as the last several years have resulted in record water usage during the summer months. This presentation focuses on short-term capacity improvements made in 2021 to increase the reliability and allow the MWC to provide water to its customers during peak seasons while the long-term capital improvements are implemented.

CEU Relevance Statement: Short term capacity improvements are helpful to many water treatment plants that face capacity limitations and do not have the time or funding to implement long term solutions. This presentation will share ideas from the Medford project that should be applicable to many other PNW utilities. We will touch on the ideas, implementation, and results of these changes to help others who are in the same predicament.

Author: Joshua Kennedy **Author's Job Title:** Drinking Water Engineer

Email: joshua.kennedy@jacobs.com **Phone:** 206-765-7652

Organization: Jacobs

Primary Job Duties: I am a civil process engineer primarily working on drinking water treatment projects to plan, design, and implement projects at Water Treatment Plants.

Related Prior Employment: I have worked at Jacobs (formerly CH2M Hill) since 2014. Before 2014 I was in the Peace Corps from 2011 to 2013 as a water and sanitation engineer.

Registrations or Certifications: Professional Engineer, WA State

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Session ID: TreatTPM06 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Take it to the Limit – Hydraulic Testing at Maximum Instantaneous Plant Capacity

Abstract: Ask a water treatment plant operator, "what's your plant's maximum capacity," and you will likely get a confident answer followed by a lengthy list of limitations. The 150-MGD Lanier Filter Plant is one of two water treatment facilities operated by the Gwinnett County Department of Water Resources and one of the only direct filtration plants in Georgia, permitted for 7.5 gpm/sf. A hydraulic model of the 44-year-old plant, recently developed for an updated Master Plan, raised concerns about degraded hydraulic conditions affecting peak plant capacity, and a full-scale test was undertaken to evaluate those concerns. Planning for the test included in-depth engineering research into the existing plant conditions, development of alarm and abort criteria, and iterations of Go/No-Go test acceptance conditions. This work highlights the value of preparing test plans to mitigate risk, gathering relevant and informative data, and evaluating stress-test performance to identify needed improvements.

CEU Relevance Statement: As an example of the operational work that goes into proactive master planning, this test serves treatment plants of any design as a framework to plan an intentional stress test, consider the risks in pushing a hydraulic system to its capacity, and discover the critical value of teamwork between operations, maintenance, and engineering. This hydraulic test was performed, and this presentation subsequently developed, while the author was employed on the engineering staff at Gwinnett County, and the hydraulic modelling for the master plan was developed by Jacobs Engineering Group in Atlanta.

Author: Spencer Adams **Author's Job Title:** Water Project Manager

Email: spencer.adams@jacobs.com **Phone:** 214-335-7810

Organization: Jacobs

Primary Job Duties: As a project manager for municipal water projects, I am responsible for managing the scope and the delivery of the design of engineering projects, including engineering studies to support long-term capital planning. As a civil engineer with over 10-years' experience in the municipal water sector as both as a consultant and on a utility's staff, I bring an operations-focused perspective to every project and an engrained aspiration for engineering and construction quality.

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Related Prior Employment: Previously employed as a project manager for capital facility projects for the Gwinnett County Department of Water Resources in Atlanta, Georgia, including primarily water treatment plant and pump station work. Prior to tenure in the public sector, worked

Registrations or Certifications: Professional Engineer (GA, MI, OR, TX); Public Drinking Water System Operator Class III (GA); Designated Design-Build Professional (DBIA); Certified Construction Contracts Administrator (CSI)

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Session ID: WWTAM01 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Both

Presentation Title: Chlorine Residual in Potable Water Systems at Large Treatment Facilities - A Field Study

Abstract: Water and wastewater treatment plants and other associated facilities can be wide spread in plan and have needs for potable water for many uses in all corners. The low volume of use can lead to long residence times in the piping and a decline in residual disinfection. This field study tested chlorine residual (free & total) at several in-plant locations at various treatment plants and pump station in the King County Wastewater Treatment Division system over the course of a year. The goal was to monitor chlorine residual and determine if low residual could be a health issue for operators.

CEU Relevance Statement: This presentation provides field data collected over the course of a year at multiple facilities and at several locations within each facility with the goal of determining if chlorine residual was present and if that changed over the seasons. Current research shows that low chlorine residual and long water age can provide a breeding ground for Legionella and other pathogens. The goal is to determine if water age at facilities represents a risk to the operators and other staff. This is a question that is often overlooked at our plants and with large building systems in general.

Author: Jeff Lundt **Author's Job Title:** Principal Engineer

Email: jeff.lundt@kingcounty.gov **Phone:** 2064775582

Organization: King County Wastewater Treatment Division

Primary Job Duties: Lead mechanical engineer responsible for planning, design and construction of a variety of process improvements and new facilities. Also responsible for providing guidance and review of consultant designed facilities.

Related Prior Employment: 29 years as a consultant working on the planning, design and construction of public works.

Registrations or Certifications: Registered Professional Civil Engineer in WA, OR, AK, ID & MT. Operator training coordinator for Northwest Washington Subsection PNWS-AWWA. Member AWWA, WEF, PNCWA.

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Session ID: WWTAM02 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Both

Presentation Title: Virtual Factory Acceptance Test: Innovation Developed through a Pandemic

Abstract: King County's Georgetown Wet Weather Treatment Station (GWWTS) was half-way through construction when the pandemic began, and several pieces of equipment were in fabrication in different parts of the country. The project remained flexible and adapted, and the concept of a virtual factory acceptance test (FAT) began to take shape for remote witness testing. Some equipment manufacturers offered a virtual FAT, while others required it to minimize risk of exposure for their staff. The project viewed this as an opportunity to have the design EOR witness the test, instead of a proxy from a nearby consultant office. This virtual FAT also allowed more people to witness the test, including client engineering staff and operators, that normally would not be able to travel and attend. This presentation will review several pieces of equipment which were factory tested by various means, and present considerations for the future of factory testing.

CEU Relevance Statement: Major pieces of equipment will often times have a Factory Acceptance Test (FAT) specified, where the Engineer of Record (EOR) travels to the factory to inspect the piece of equipment, the test setup, observe different test runs and correlate those conditions with design conditions. The use of Virtual FATs allows for more people, including operators who will be using the equipment, to witness the testing and ask the manufacturer questions even before the equipment gets on site.

Author: Tina Hastings **Author's Job Title:** Senior Project Manager - Wastewater Engineer

Email: Tina.Hastings@jacobs.com **Phone:** 425.533.3523

Organization: Jacobs

Primary Job Duties: Lead Engineer on water and wastewater projects.

Related Prior Employment:

Registrations or Certifications: PE, PMP, ENV SP

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Session ID: WWTAM03 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Both

Presentation Title: Why Coat Concrete Structures in Potable and Waste Water Systems

Abstract: The potable and waste water industry makes significant use of concrete structures, especially tanks and currently, the vast majority of these structures are uncoated. Though frequently thought of as "maintenance-free", to prolong the life of concrete assets, they should be a part of an ongoing sustainable asset management program, of which coatings are an integral part. Coating systems for concrete tanks are a key component of rehabilitation and long term maintenance. Concrete, a heterogeneous material, often has a variety of inherent defects including porosity, drying-shrinkage cracks, bug holes, honeycombing, and cracks. Over time, spalling and additional crack formation may lead to structural issues potentially endangering the asset. The very nature of uncoated concrete creates an environment where significant water quality and compliance issues associated with biological fouling may exist.

CEU Relevance Statement: This presentation will provide an overview on the basics of concrete, concrete in water and waste water systems, and problems associated with concrete will be presented. A discussion on maintenance to protect the asset, NSF approval of materials, and improved water quality will allow the Owner to easily see the benefits of coating existing and new concrete structures. Lastly, several examples of 'before and after' projects will be discussed. In summation this paper provides compelling evidence for coating concrete structures in the potable and waste water industry.

Author: Jeff Austin **Author's Job Title:** Water System Consultant

Email: jeffrey.austin@suez.com **Phone:** 503-713-8823

Organization: Suez - Advanced Solutions

Primary Job Duties: Water Systems Consultant with SUEZ – Advanced Solutions. Assist water and waste water systems in developing long-term infrastructure asset rehabilitation and management solutions.

Related Prior Employment:

Registrations or Certifications:

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Session ID: WWTAM04 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Wastewater

Presentation Title: Biosolids on the Farm - A Virtual Tour

Abstract: Take a virtual tour of Boulder Park in eastern Washington where biosolids are applied to agricultural land to boost crop production. Tour includes overview of application and spreading methods as well as interviews with operators and farmers who handle and use biosolids.

CEU Relevance Statement: Tour will cover considerations for for using Class B biosolids in a agriculture setting and discuss means and methods for applying biosolids in large land applications including how application rates are determined and monitored.

Author: Jon Kercher **Author's Job Title:** Operations Supervisor

Email: jon.kercher@piercecountywa.gov **Phone:** 253-798-2409

Organization: Pierce County Planning and Public Works

Primary Job Duties: Jon has been a WWTPO in the Pacific Northwest for over 10 years, with experience in the operation and maintenance of water distribution, collections system and wastewater treatment plants. He is the Operations Supervisor for Pierce County's Chambers Creek and Cascadia Treatment Plants.

Related Prior Employment:

Registrations or Certifications:

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Session ID: WWTAM05 **Date:** 4/28/2022 **Length of Session:** 60 minutes

Area of Relevancy: Wastewater

Presentation Title: Listen Closely, Your Sewer is Talking to You

Abstract: This presentation reviews how customers can adopt unique and patented monitoring technology, which gives them data in the field that they did not have before. The level monitors mount directly on the manhole covers – thereby eliminating the need for a confined space entry - and use ultrasonic sensors to monitor water levels.

CEU Relevance Statement: Real-time remote water level monitoring can identify locations where a possible sewer system overflow (SSO) is developing and alarm these conditions before the overflow, allowing field staff to visit the site and perform corrective actions. Locating these problems prior to an SSO actually occurring has enabled users of this unique monitoring tool to pinpoint the causes of these blockages.

Author: Brogan Quist **Author's Job Title:** West Regional Sales Manager

Email: bquist@smartcoversystems.com **Phone:** (760) 207-8348

Organization: SmartCover

Primary Job Duties: As a regional manager for SmartCover, Brogan helps customers in the Western Region of the United States and Canada. He has been working in the wastewater/water tech industry for over 9 years and has worked with customers at over 1,000 sites by both looking reviewing data and installing units.

Related Prior Employment:

Registrations or Certifications:

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Session ID: WWTPM01 **Date:** 4/28/2022 **Length of Session:** 60 minutes

Area of Relevancy: Both

Presentation Title: Benefits of Recycled Water

Abstract: General overview of reclaimed water, and its various issues to include its increasing use for water rights mitigation.

CEU Relevance Statement: Covers typical methods for generating reclaimed water and its various applications. Will briefly review process and technologies used the the production of reclaimed water and provide an overview of the current state of reclaimed water regulations.

Author: Christopher Stoll **Author's Job Title:** Project Manager

Email: chrisstoll@kennedyjenks.com **Phone:** (206) 376-2924

Organization: Kennedy Jenks

Primary Job Duties: Chris Stoll is a Project Manager and Project Engineer with Kennedy Jenks. Chris has over 10 years of experience managing, designing and planning sewer and water projects. Chris has also been involved in planning recycled water projects and developing innovative solutions for "One Water" management strategies. Chris is a licensed professional engineer (in WA and OR), a project management professional and an Envision certified sustainability professional.

Related Prior Employment:

Registrations or Certifications: PE, PMP, ENV-SP

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Session ID: WWTPM02 **Date:** 4/28/2022 **Length of Session:** 60 minutes

Area of Relevancy: Wastewater

Presentation Title: Cascadia WWTP Virtual Facility Tour

Abstract: Virtual video tour of Pierce County's new Cascadia WWTP near Bonney Lake, WA. Video includes aerial video of plant, guided plant walk-through and interviews with the design engineer and operations staff.

CEU Relevance Statement: Plant tour and interview with staff both show the various systems used at the plant and interviews with design engineer discuss why specific decisions were made during design and plant staff discuss the ins and outs of operating the plant.

Author: Jon Kercher **Author's Job Title:** Operations Supervisor

Email: jon.kercher@piercecountywa.gov **Phone:** 253-798-2409

Organization: Pierce County Planning and Public Works

Primary Job Duties: Jon has been a WWTPO in the pacific northwest for over 10 years, with experience in the operation and maintenance of water distribution, collections system and wastewater treatment plants. He is the Operations Supervisor for Pierce County's Chambers Creek and Cascadia Treatment Plants.

Related Prior Employment:

Registrations or Certifications:

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Session ID: WWTPM03 **Date:** 4/28/2022 **Length of Session:** 60 minutes

Area of Relevancy: Wastewater

Presentation Title: PFAS and Biosolids - Current Issues and a Look Forward

Abstract: As PFAS are recalcitrant and are not removed through conventional wastewater treatment, management of PFAS in WW effluent and biosolids streams is gaining increased concern and scrutiny. This presentation will address the following questions related to PFAS in wastewater and biosolids: What are PFAS? Why are PFAS in wastewater? What is the fate of PFAS in biological treatment systems? What is the current status of regulations related to PFAS in wastewater and biosolids? What technologies can be used to treat PFAS in wastewater and biosolids?

CEU Relevance Statement: Data will be presented on PFAS measured in biosolids before and after various biosolids treatment technologies including composting, drying, and pyrolysis. This presentation will help utility planners, operators, engineers and administrators understand the nature of the PFAS issue, how these compounds are introduced into wastewater and biosolids, the rapidly changing regulatory landscape, and what technologies are being used to eliminate these compounds from wastewater biosolids products.

Author: Todd Williams **Author's Job Title:** Senior Principal Technologist

Email: todd.williams3@jacobs.com **Phone:** (804) 833-9122

Organization: Jacobs

Primary Job Duties: Mr. Williams has a 40-year career in environmental engineering with operating and design experience and specific emphasis in biosolids management planning, and product utilization. Todd has assisted many wastewater cities, agencies and communities throughout North America in developing sustainable biosolids management programs. He has direct experience with new and emerging biosolids treatment technologies such as advanced digestion, drying, pyrolysis, gasification and composting. Todd is the past Chair of the Water Environment Federation's Residuals and Biosolids Committee and currently serves as the Jacobs Residuals Resource Recovery Global Technology Leader.

Related Prior Employment:

Registrations or Certifications: PE, BCEE

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Greater Tacoma Convention Center 1500 Commerce St., Tacoma, WA 98402

Session ID: DWITTAM01 **Date:** 4/28/2022 **Length of Session:** 60 minutes

Area of Relevancy: Both

Presentation Title: Introduction to SCADA Cybersecurity

Abstract: Introduction to Cybersecurity with regards to SCADA/Control Systems, discussion about cybersecurity risks and common network security terms. Discuss how to communicate with IT Staff and Consultants regarding cybersecurity topics addressing examples of Cybersecurity risks, failures, implementations and the future of cybersecurity in general.

CEU Relevance Statement: Better understand the methods of protecting SCADA systems and the infrastructure operations from cyber attacks. Risk awareness and ways to improve controls systems to reduce exposure from outside threats and ways to prevent malware infections.

Author: Lee Tumbleson **Author's Job Title:** Senior SCADA/Control Systems Engineering Principal

Email: ltumbleson@rh2.com **Phone:** 206.794.6610

Organization: RH2 Engineering Inc

Primary Job Duties: Senior control systems engineer designing control systems and software development/integration for water, wastewater, storm water, and irrigation systems.

Related Prior Employment: Lee has been with RH2 Engineering for 32 years with a focus on control system design and support. Lee is also the primary on-call computer network IT manager for many Seattle area water purveyors. He received a BS in Mechanical Engineering from Washington

Registrations or Certifications: Professional Engineer

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Greater Tacoma Convention Center 1500 Commerce St., Tacoma, WA 98402

Session ID: DWITTAM02 **Date:** 4/28/2022 **Length of Session:** 60 minutes

Area of Relevancy: Both

Presentation Title: Common AWIA Assessment Findings and How To Address Them

Abstract: America's Water Infrastructure Act of 2018 (AWIA) required all drinking water utilities serving populations of over 3,500 to conduct a risk and resilience assessment (RRA) of their critical business and control systems. After assisting over 20 utilities with AWIA assessments, it is apparent that utilities -- regardless of size -- face common cybersecurity challenges. Although every utility has unique system and staffing concerns, they face a pervasive set of common threats and challenges. These have become increasingly important as utilities are increasingly facing threats from the sophisticated Advanced Persistent Threat (APT) attacks behind the recent increase of ransomware attacks targeting utilities and municipalities.

CEU Relevance Statement: This presentation will summarize the results of our experience in conducting AWIA RRA projects with many utilities in the Pacific Northwest. We will review the most pressing issues utilities are facing and provide recommendations for improving a utility's ability to prevent, detect, and most importantly, recover from a cyber-attack or large-scale natural event. Topics include: support staff training and cybersecurity skill sets; general staff cybersecurity awareness; asset identification and management; formalized and tested cybersecurity policies and procedures; malware protection and anomaly detection; software and system update procedures; external data exchange; remote access; incident response; backup and recovery strategies. Strategies for preventing, mitigating, and recovering from ransomware and other potentially devastating attacks will be presented, and information to local, state, and federal resources reviewed.

Author: Bob George **Author's Job Title:** Directory Cybersecurity & Network Infrastructure Services

Email: bob.george@tetratech.com **Phone:** 508-306-1435

Organization: Tetra Tech

Primary Job Duties: Director of Cybersecurity & Network Infrastructure Services with Tetra Tech. He has over 35 years' experience in the design, management and support of IT and SCADA/ICS networks. Bob holds the (ISC)2 Certified Information Systems Security Professional (CISSP) certification, backed with extensive experience in the practical aspects of information security. Bob has conducted network security assessments and penetration testing and designed and implemented cybersecurity controls for large and small utilities throughout the United States and Canada. He served as lead technical

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investigator and subject matter expert for the development of the AWWA Cybersecurity Guidance Tool, and for the EPA-funded WERF study of "Security Measures for Computerized and Automated Systems."

Related Prior Employment: 35+ years network experience, 26+ years W/WW SCADA/ICS experience.

Registrations or Certifications: CISSP

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Session ID: DWITTAM03 **Date:** 4/28/2022 **Length of Session:** 60 minutes

Area of Relevancy: Both

Presentation Title: Surviving SCADA Ransomware Attacks

Abstract: While high profile ransomware attacks on critical infrastructure are garnering a lot of attention, these attacks and others like them have threatened SCADA and process control systems for years. The EPA has identified an annual threat probability for attempted attacks against water and wastewater utilities of 10 to 30%. System owners and operators must increasingly be prepared not only to prevent, but also to survive an attack. The increasing sophistication and persistence of these attacks endangers even air gapped systems. This paper focuses on practical and affordable real-world measures that system owners can implement and test to improve the resiliency of critical SCADA and computerized systems to prepare for and recover from a ransomware or other advanced attack. The focus is on improving the security of existing production systems without significant downtime, while planning future system upgrades with a security focus. Topics to be covered in this paper include: Advanced Persistent Threats (APTs), Ransomware, and the Cyber Kill Chain – Ransomware attack progression; Applying the NIST Cybersecurity Framework to SCADA systems; Quick-win Short Term Mitigation; Long-term Mitigation; Incident response; Resources.

CEU Relevance Statement: This paper focuses on practical and affordable real-world measures that system owners can implement and test to improve the resiliency of critical SCADA and computerized systems to prepare for and recover from a ransomware or other advanced attack. The focus is on improving the security of existing production systems without significant downtime, while planning future system upgrades with a security focus.

Author: Bob George **Author's Job Title:** Director Cybersecurity & Network Infrastructure Services

Email: bob.george@tetratech.com **Phone:** 508-306-1435

Organization: Tetra Tech

Primary Job Duties: Director of Cybersecurity & Network Infrastructure Services with Tetra Tech. He has over 35 years' experience in the design, management and support of IT and SCADA/ICS networks. Bob holds the (ISC)2 Certified Information Systems Security Professional (CISSP) certification, backed with extensive experience in the practical aspects of information security. Bob has conducted network security assessments and penetration testing and designed and implemented cybersecurity controls for large and small utilities throughout the United States and Canada. He served as lead technical

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investigator and subject matter expert for the development of the AWWA Cybersecurity Guidance Tool, and for the EPA-funded WERF study of "Security Measures for Computerized and Automated Systems."

Related Prior Employment: 35+ years in network technology, 26+ years in W/WW OT cybersecurity.

Registrations or Certifications: CISSP

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Session ID: DWITTPM01 **Date:** 4/28/2022 **Length of Session:** 60 minutes

Area of Relevancy: Both

Presentation Title: New Tech Normal and Digital Revolution

Abstract: The whole world was moving online, but now accelerated by the pandemic. What are the best tools to do your job? What kind of technology you should be investing in? What protocols or trends are upcoming that you should consider leveraging? Accessing GIS maps and other information and data on mobile devices is no longer a luxury today; it's a necessity to effectively make decisions and run your operations. It also prevents data loss (data otherwise stored on various other methods) and ensures business continuity and data protection. This session will deal with the basic understanding of the paradigm shift, and provide ideas and tools to bank on. You will have a foundational understanding and action items on how to migrate from paper and human intensive processes to the digital world to optimize and run your operations seamlessly and efficiently.

CEU Relevance Statement: We teach this class everywhere including rural water, special districts, city conferences in multiple states. We also teach multiple CEU driven classes on this topic year round with those organizations. Operators, Managers, Council and Board members learn the needs and wants of such systems and tech, and how these can help them do their job economically, efficiently, productively while meeting safety, regulatory and compliance requirements. This also helps secure more funds and grants, and direct those towards the service of the citizens.

Author: Arnab Bhowmick **Author's Job Title:** Founder and CEO

Email: ARNAB@AAKAVS.COM **Phone:** 4252453569

Organization: Aktivov Asset Management

Primary Job Duties: Arnab has more than 21+ years of technical and managerial experience in business and operations, asset maintenance and management, GIS, emergency management, IT security, strategic planning etc. He is currently the Chair of American Public Works Association (APWA) Asset Management Committee and has been advising the CxO level executives, City and District managers and department heads for couple decades on asset management, GIS and IT strategies, business continuity, technology trends, and e-governance.

Related Prior Employment: Arnab has worked for many corporations including Weston Solutions, ESRI, Tata Group, founded Aktivov Asset Management and Aakavs Consulting, and has a bachelors in Civil Engineering and masters in GIS/BIS and sustainable engineering technologies.

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Registrations or Certifications: BE,MS,GISP,LEED AP

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Session ID: DWITTPM02 **Date:** 4/28/2022 **Length of Session:** 60 minutes

Area of Relevancy: Both

Presentation Title: How Lakewood Water District uses ArcGIS and UtiliSync 811 to manage utility locates.

Abstract: It is so important that our 811 locators are able to easily access GIS utility data in the field so they can quickly, and correctly, locate utilities in the field. In this presentation, we will show how Lakewood Water District uses ArcGIS Field Maps and UtiliSync 811 TMS to manage 811 locates, even when they are offline!

CEU Relevance Statement: In this presentation GIS, utility locating, ArcGIS applications and UtiliSync 811 will be discussed. It is so important that our 811 locators are able to easily access GIS utility data in the field so they can quickly, and correctly, locate utilities in the field to prevent service disruptions due to construction dig-ups of underground water infrastructure.

Author: Matt Stayner **Author's Job Title:** Founder

Email: mstayner@utilisync.com **Phone:** 385-275-5535

Organization: UtiliSync

Primary Job Duties: I am the founder of UtiliSync and have worked with utility owners for over 20 years to help them with their GIS needs. For the pages 8 years, I have been working on building applications that can automate field work.

Related Prior Employment: M.S. in Civil Engineering. Water Resources consultant. App developer.

Registrations or Certifications: Professional Engineer

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Session ID: DWITTPM03 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Both

Presentation Title: Digital Twins in the Water Sector

Abstract: A digital twin may be considerd as a "one-stop shop" for all the data associated with water operations. A water utility has a wide variety of data associated with its operations, including P&ID's, asset information, GIS, financial records, and SCADA/Historian data. This data may be in separate departments, hosted by disparate software tools, and stored on different computers and servers. Organizing this data can be the first step in the journey to a digital twin.

CEU Relevance Statement: Water systems are made up of many assets and infrastructure. Having access to all of this asset data instantaneously provides a platform that supports many aspects of operations, including maintenance optimization, capital investment planning, and scenario planning to evaluate operational changes digitally.

Author: Eoin Howlett **Author's Job Title:** VP Advanced Analytics

Email: eoin.howlett@tetratech.com **Phone:** 401 855 6224

Organization: Tetra Tech Inc

Primary Job Duties: Technology lead for Tetra Tech. Coordinates technology implementation (AI, analytics, IIoT, modeling and geospatial) with engineering and science teams to deliver pragmatic solutions for clients in the water sector.

Related Prior Employment: CEO of Applied Science Associates, a science and technology company that combined environmental modeling, IoT data, and GIS to solve complex multidisciplinary environmental problems.

Registrations or Certifications: Electrical Engineering, MBA, Machine Learning/Data Science

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Session ID: DWITTPM04 **Date:** 4/28/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Real-time Software for Distribution System Operations: An Operator-Focused Design Approach

Abstract: MWS partnered with Xylem to develop a real-time hydraulic and water quality distribution system decision support tool to aid in these efforts. Xylem's Polaris™ Core Software Services (PCSS) provided the opportunity to optimize the water distribution operation efforts by employing a flexible and configurable "live" water modeling solution that is tailored to Nashville's infrastructure assets.

CEU Relevance Statement: Without access to this real-time information, how can a water utility fully understand the challenges that create a water distribution issue, and provide the optimal resolution? Many issues facing the operations of water distributions systems are difficult to resolve because the circumstances creating those issues are complicated and constantly changing. Thus, traditional water modeling approaches that rely on a static planning-level description of system operations, are inadequate to the task. The Polaris solution delivers the above real time information in a manner that helps operators discover the underlying causes of distribution system issues; these data were previously unavailable to support operations in a timely manner and would have required complex and expensive engineering analyses. This presentation details how Polaris was successfully designed and implemented at MWS and provides the necessary tools for effective and efficient management of the water distribution system.

Author: Marcelo Cusacovich **Author's Job Title:** Product Manager

Email: marcelo.cusacovich@xylem.com **Phone:** 16309405340

Organization: Xylem

Primary Job Duties: Lead development of drinking water network optimization digital solutions at Xylem

Related Prior Employment:

Registrations or Certifications:

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Session ID: DistEBF01 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Both

Presentation Title: Pipe Thrust Restraint Buried

Abstract: Review the conditions under which buried water main thrust restraint is required and the methods by which this can be achieved. Focus will be placed on construction field conditions that can impact the factor of safety and possibly lead to failure under testing or operation. Thrust restraint for testing and final connections will also be reviewed.

CEU Relevance Statement: Thrust restraint is often misunderstood which can ultimately lead to system failure, impacting water quality, interruption of the water supply, and potentially affecting the safety of the water department staff and general public. The fundamental principles of fluid mechanics and resulting forces will be introduced, and how this impacts thrust restraint within vaults and structures. Thrust restraint, especially for large diameter piping systems, can be complicated especially at the transition from buried to exposed. Ultimately the purpose of this discussion is to address thrust restraint scenarios which may require traditional and or non-standard solutions. Operators working in the field must be able to recognize thrust restraint when they uncover it, to avoid disturbing it and causing catastrophic failure of the pipe.

Author: Douglas Schlepp **Author's Job Title:** Principal

Email: dschlepp@rh2.com **Phone:** 2067946608

Organization: RH2 Engineering Inc

Primary Job Duties: Doug is a Principal for RH2 Engineering, with over 30 years of experience providing engineering consulting and construction management services for Municipal and Special Purpose Districts. Currently he is the District Engineer for a Seattle area Water and Sewer District, as well as the development services Project Manager for a local Seattle Area city.

Related Prior Employment:

Registrations or Certifications: PE in Washington State

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Session ID: DistEBF02 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Both

Presentation Title: Pipe Thrust Restraint Exposed

Abstract: Review the conditions under which exposed water main thrust restraint is required and the methods by which this can be achieved. Focus will be placed on construction field conditions that can impact the factor of safety and possibly lead to failure under testing or operation. Thrust restraint for completed systems will also be reviewed together with the impact of removing parts such as a water meter.

CEU Relevance Statement: Thrust restraint is often misunderstood which can ultimately lead to system failure, impacting water quality, interruption of the water supply, and potentially affecting the safety of the water department staff and general public. The fundamental principles of fluid mechanics and resulting forces will be introduced, and how this impacts thrust restraint within vaults and structures. Thrust restraint, especially for large diameter piping systems, can be complicated especially at the transition from buried to exposed. Ultimately the purpose of this discussion is to address thrust restraint scenarios which may require traditional and or non-standard solutions. Operators working in the field must be able to recognize thrust restraint when they uncover it, to avoid disturbing it and causing catastrophic failure of the pipe.

Author: Daniel Kegley **Author's Job Title:** Senior Water Resource Consultant

Email: dkegley@gsiws.com **Phone:** 509-919-0546

Organization: GSI Water Solutions, Inc.

Primary Job Duties: Dan is now semi-retired, working part time for GSI Water Solutions as a Senior Water Resource Consultant. Dan has been involved with AWWA since 2000 serving as section chair in 2015-16 and a George Warren Fuller recipient.

Related Prior Employment: Dan began at the City of Spokane Water Department in April of 1991 as an entry level laborer. Dan worked his way to Director of Water and Hydroelectric services for the City spending 18 of his 29 years in construction and maintenance before moving to man

Registrations or Certifications: Water Distribution Manger IV; Cross Connection Control Specialist

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Session ID: DistFAM01 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Both

Presentation Title: Clearing the Air on Air Valves: Air/Vac/Air Release Valves Design, Selection, and Sizing

Abstract: Air valves are a vital component of any water system, and are receiving increased attention from regulators as potential sources of contamination in the distribution system. This presentation discusses why air valves are necessary, how types of air valves work, where to place them, and how to size them.

CEU Relevance Statement: Engineers and operators will gain understanding why air valves are needed, where they are needed, how they work, and how to size for their system demands on water and wastewater applications. This presentation reinforces the importance of positioning air valves and sizing them correctly, to protect the integrity of the water system and to avoid potential routes of contamination. The course also discusses considerations for low and high pressure applications.

Author: Steve Causseaux **Author's Job Title:** Regional Manager

Email: steve@cimco-gcsystems.com **Phone:** 2535345667

Organization: Cimco-GC Systems

Primary Job Duties: Steve Causseaux consults with engineers and water operators on hydraulic control valve, check valve, and air valve selection, operation, and troubleshooting in Oregon and S. Washington for Cimco-GC Systems a local independent representative firm. Steve also constantly seeks, researches, and sources new innovations in water and wastewater for improved system performance and energy/resource conservation.

Related Prior Employment: Steve has spent the past 16 years working in water management for irrigation, waterworks, and construction projects: 4 years as an environmental consultant in the AZ deserts working with major home builders to control pollutants and erosion. 12 years as

Registrations or Certifications: N/A

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Session ID: DistFAM02 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Hydraulic Control Valve Training

Abstract: This presentation will focus on the operation, maintenance, and selection of control valves. These integral parts of a pressurized water system have many functionalities and we will cover the most common use cases. The basic issues and troubleshooting steps will also be discussed.

CEU Relevance Statement: Hydraulic control valves are ubiquitous in drinking water systems. A basic understanding of their operation and maintenance is critical for operations and engineers working at a utility. The course will be introductory due to time, but will include valuable information applicable to almost every system.

Author: Mike Uthe **Author's Job Title:** Area Manager

Email: muthe@muellerwp.com **Phone:** 4062232192

Organization: Mueller Water Products

Primary Job Duties: I cover the Northwestern USA for Mueller's technology division. These products include IoT sensors, assessment services, and automated valves. In this role I act as a consultant, technical resource, and technician.

Related Prior Employment: Prior to Mueller I worked as an application engineer for a manufacturer's rep firm where I designed pumping systems and wastewater treatment systems. Before this I worked in the oil fields with pipelines, refineries, and compressor stations.

Registrations or Certifications: Master's of Mechanical Engineering

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Session ID: DistFAM03 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Leveraging a Hydraulic Model Across An Entire Organization

Abstract: Tacoma Water serves clean and reliable water to nearly 350,000 people in the City of Tacoma and 10 additional jurisdictions and in Pierce County, Washington. To assist with decision making, Tacoma Water's uses a hydraulic model to evaluate and predict a full range of potential system operations. This presentation will discuss how the hydraulic model supports operations and maintenance using real world examples of common activities at the Utility. The presenters will share lessons learned for coordinating model inquiries, data management, and presenting results across internal staff, consultants, and the public.

CEU Relevance Statement: Operators will learn how to leverage a hydraulic model to inform operation and maintenance decisions. They will also learn some options for how to coordinate with engineers, consultants, and others to bring together a spectrum of knowledge of the system and gain confidence in a hydraulic model to get the answers they need to help guide their operations and improve their systems.

Author: Daniel Reisinger **Author's Job Title:** Professional Engineer

Email: dreisinger@cityoftacoma.org **Phone:** 303-913-4949

Organization: Tacoma Water

Primary Job Duties: Daniel has worked as a Civil Engineer for over 15 years focusing on utility system planning and hydraulic modeling. He a system planning engineer with Tacoma Water responsible for assisting with water system planning and support of operations and maintenance.

Related Prior Employment:

Registrations or Certifications: WA PE 53657

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Session ID: DistFAM04 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Using Hydraulic Modeling to Support Storage Evaluation and Operational Changes

Abstract: The City of Tukwila's water distribution system hydraulic model includes 44 miles of pipe in six pressure zones. The City currently has one 2MG storage reservoir, which directly serves three of its zones, and is planning to add 2.5MG of storage, with one or more pump stations, to meet future needs. The City's calibrated hydraulic model was used to evaluate storage alternatives, including four different sites and five system configurations. The hydraulic model was also used to confirm the sizing of the new infrastructure, including storage reservoir, pump stations, and transmission pipes, as well as gaining an understanding of the potential impacts to current system operations. Tank oscillation, turnover and operational strategies were investigated during this process. The presentation will summarize the City's storage requirements, review the alternatives analysis, and describe how the hydraulic model was used to evaluate the proposed storage recommendations.

CEU Relevance Statement: With a calibrated model, utilities can review and test the performance of the proposed improvements for operation of their water system before design and implementation. The presentation will describe how the hydraulic model was used to confirm operation of the proposed reservoir, including flows in and out of the tank, tank cycling, turnover, and pressures within the distribution system. The results of the hydraulic modeling can be used to inform decisions about system operations and management.

Author: Aurelie Nabonnand **Author's Job Title:** Lead Engineer

Email: ANabonnand@carollo.com **Phone:** 5599784591

Organization: Carollo Engineers

Primary Job Duties: Aurelie is a lead engineer with Carollo Engineers with 9 years of experience focused on wastewater, stormwater, and water hydraulic modeling and master planning projects. She has developed new hydraulic models using City' system-wide GIS data as well as implemented several extensive model updates. Aurelie is also experienced with the calibration and validation of hydraulic models, and the implementation of Capital Improvement Projects. She has worked on more than fifty modeling projects in Washington, Oregon, Oklahoma, and California.

Related Prior Employment:

Registrations or Certifications: PE in Washington and Oregon

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Session ID: DistFAM05 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Both

Presentation Title: Putting Tools in One Place: How Lakewood Water District Integrates Field Data Systems

Abstract: This talk will describe how Lakewood Water District uses embedded links and forms to limit the number of different interfaces field workers need to access. Covered here will be the use of Survey123, Microsoft Forms, ArcGIS, GPS Technology, and SharePoint to enhance field worker efficiency. The approach illustrated in this presentation focuses on using off the shelf technology solutions that require zero coding. Solutions highlighted include accessing As-Built records through embedded SharePoint Links, use of Survey123 based FireFlow Calculator, Collection of field data using GPS from ArcGIS FieldMaps, and using SharePoint Homepages to aggregate links needed by operators.

CEU Relevance Statement: This presentation illustrates how a basic knowledge of Microsoft Excel, ArcGIS, and Internet use can be leveraged to enhance the ability for field staff to access the data needed to perform their job. The overall educational goal of this presentation is to enhance digital literacy skills for Water System Operators. By showing how basic Excel and Internet skills can be leveraged, Operators can spend less time searching and submitting information. Operators can also use these tools to perform more operational analysis themselves.

Author: Kevin Wyckoff **Author's Job Title:** GIS Coordinator

Email: kwyckoff@lakewoodwater.org **Phone:** 2533006693

Organization: Lakewood Water District

Primary Job Duties: In charge of mapping and data management for field operations for a medium sized drinking water utility. Responsibilities revolve around supporting operations and planning activities with high quality information products.

Related Prior Employment:

Registrations or Certifications: Geographic Information Systems Professional (GISP)

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Session ID: DistFAM06 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Calibrating Distribution System Models – From the Field to the Desktop

Abstract: A calibrated distribution system hydraulic model is a valuable tool for system analysis, operations/maintenance, and development of capital improvement programs. This presentation will describe real-world strategies and techniques for calibrating both steady-state and extended-period-simulation hydraulic models. The presentation will detail methods of collecting data in the field, and ways to utilize the collected field data to calibrate the hydraulic model.

CEU Relevance Statement: From an operations, maintenance, and management standpoint, a calibrated distribution system hydraulic model is valuable in that it permits different system configurations to be simulated accurately. Impacts to customer level of service from changes in the system configuration can be accurately evaluated. Operators can use the information provided by a calibrated hydraulic model to inform decisions regarding water system configuration changes and management.

Author: Zach Schrempp **Author's Job Title:** Project Engineer

Email: zschrempp@rh2.com **Phone:** 425-951-5319

Organization: RH2 Engineering Inc

Primary Job Duties: Consulting engineer with a primary focus on hydraulic modeling and development of water and sewer planning documents. Experience also includes analysis, planning, design, and construction of drinking water, wastewater, and stormwater facilities.

Related Prior Employment:

Registrations or Certifications: Registered Professional Engineer in Washington and Oregon.

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Session ID: EngEBF01 **Date:** 4/29/2022 **Length of Session:** 60 minutes

Area of Relevancy: Drinking Water

Presentation Title: Hydraulic Control Valve Fundamentals

Abstract: Engineers and operators will gain an understanding of basic hydraulics, control valve operation, pilot system operation, pressure reducing valves, pressure relief, pressure sustaining valves, and how to size a valve. This is a course for engineers and operators who would like to obtain foundational knowledge of hydraulic control valves.

CEU Relevance Statement: Hydraulic control valves are often misunderstood, miss applied, or generally avoided due to a lack of understanding. The purpose of this course is to help operators and engineers become more comfortable when approaching a control in operation or during the design and selection stage.

Author: Steve Causseaux **Author's Job Title:** Regional Manager

Email: steve@cimco-gcsystems.com **Phone:** 2535345667

Organization: Cimco-GC Systems

Primary Job Duties: Steve Causseaux consults with engineers and water operators on hydraulic control valve, check valve, and air valve selection, operation, and troubleshooting in Oregon and S. Washington for Cimco-GC Systems a local independent representative firm. Steve also constantly seeks, researches, and sources new innovations in water and wastewater for improved system performance and energy/resource conservation.

Related Prior Employment: Steve has spent the past 16 years working in water management for irrigation, waterworks, and construction projects: 4 years as an environmental consultant in the AZ deserts working with major home builders to control pollutants and erosion. 12 years as

Registrations or Certifications:

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2022 Annual Conference, Tacoma, WA April 27 – 29

Greater Tacoma Convention Center 1500 Commerce St., Tacoma, WA 98402

Session ID: EngFAM01 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Spray In Place Pipe Rehabilitation: Trench-less Technology Utilizing Advanced, 100% Solid, High Mil Epoxy Lining Systems

Abstract: Many water authorities face the challenge of a limited capital budget and aging infrastructure. Pipe replacement may not always be the most cost-effective approach to replacing aging mains. Needed funding, congestion above and below ground, and the lack of public tolerance for the disruption caused by construction work is making the replacement of water mains more difficult for utility owners. Alternative methods of restoration of aging piping systems using state of the art robotic spray application combined with 100% solids epoxy coating systems may offer a better solution. The coating system bonds with the piping system–preventing and sealing cracks– and moves with the structure, abating leaks caused by settlement. This trench-less process requires less digging, disruption, and downtime while protecting against future corrosion & degradation, extending the service life of system piping & components, and enhancing water quality.

CEU Relevance Statement: The primary objectives of the presentation are: • To review current and emerging rehabilitation technologies for water distribution mains and services. • To understand the needs of water utilities for renewal of their infrastructure and to identify technology gaps that should be addressed in order to meet these needs. • To identify key performance parameters for various rehabilitation technologies and to gather and document this information for rehabilitation technologies that are available for use in the market.

Author: Audrey Leamy **Author's Job Title:** SIPP Project Manager

Email: audrey.leamy@suez.com **Phone:** 478-987-0303

Organization: Suez - Advanced Solutions

Primary Job Duties: Line of Business Manager for Pipe Rehabilitation Services

Related Prior Employment:

Registrations or Certifications:

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Session ID: EngFAM02 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Restoring Water System Confidence with CIPP

Abstract: The City of Salem, OR recently completed the rehabilitation and replacement of a critical water main in their distribution system. Installed in 1947, the water main was identified for rehabilitation/replacement by the 2007 Water Master Plan as it was reaching the end of its design life. The 560-foot-long section of existing 30-inch diameter welded steel water main is an important backbone of the water distribution system, providing redundancy and supply to the industrial area in the south-central neighborhood of the City. Utilizing CIPP lining technology and open cut construction methods, the City rehabilitated and replaced the ageing steel waterline in and adjacent to Pringle Creek, including a portion that ran beneath a 100-foot wide railroad bridge and associated easement. This presentation discusses how the team overcame challenges during design, permitting, and construction to return system confidence while minimizing project footprint and reducing environmental impacts.

CEU Relevance Statement: Presentation is a case study for waterline rehabilitation and describes process of design, technical product evaluation, permitting, operational considerations, and lessons learned from the successfully delivery of the project. The design process engaged both the engineering and operational staff at the City to ensure that decision making included relevant perspectives and concerns related to system reliability, operational control, and future maintenance.

Author: Brendan O'Sullivan **Author's Job Title:** Principal Engineer

Email: Brendan.O'Sullivan@murraysmith.us **Phone:** 503.758.8235

Organization: Murraysmith

Primary Job Duties: With a bachelor's in civil engineering from the University of Portland, Brendan is a principal engineer and project manager at Murraysmith for public improvement projects involving rehabilitation and new installation of municipal water and wastewater infrastructure. Brendan was the recipient of the NASTT 2019 Trent Ralston Young Professional Achievement Award.

Related Prior Employment:

Registrations or Certifications: Professional Engineer OR & WA

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Session ID: EngFAM03 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Both

Presentation Title: It's Not About What's on the Outside, It's What's on the Inside that Counts! A Story of Pipeline Rehabilitation

Abstract: Tualatin Valley Water District (TVWD) has encountered corrosion leaks before, but usually the corrosion occurs on the exterior of the pipeline, and thus can be inspected through visual observations and measurements once the pipe is exposed. Unfortunately, water utility owners cannot decide when and where these leaks occur, and, on occasion, leaks occur due to internal corrosion without advanced notice. This presentation will walk through actions taken to evaluate the existing pipeline, what was discovered, and how TVWD was able to correct the issue on a tight timeline with summer demand season quickly approaching. It will also discuss further actions that are planned to evaluate other pipelines to prevent similar leaks.

CEU Relevance Statement: This presentation will help operators, engineers, and water system managers understand what can happen with fairly new facilities due to internal corrosion of pipelines. The lessons learned by TVWD can help others implement similar programs to evaluate and correct potential pipeline corrosion issues. The corrosion issues could cause supply disruption or potential water quality events.

Author: Ryan Smith **Author's Job Title:** Maintenance Engineering Supervisor

Email: Ryan.Smith@tvwd.org **Phone:** 503-848-3057

Organization: Tualatin Valley Water District

Primary Job Duties: Ryan is the Maintenance Engineering Supervisor for TVWD, with responsibilities which include evaluation, design, construction management, and maintenance of water system appurtenances and facilities.

Related Prior Employment: Ryan has been with TVWD for over 20-years, beginning first as an engineering intern, and now as the Maintenance Engineering Supervisor.

Registrations or Certifications: Water Works Operator - Distribution Level 2, Engineer-in-Training

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Session ID: EngFAM04 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Replacing the South Fork Tolt River Project Low Level Outlet Regulating Valve

Abstract: Seattle Public Uutilities is engaged in a project to replace the Low Level Outlet Regulating Valve for the South Tolt River Dam. The valve is deep within the dam and shares a tunnel with an overflow structure. The valve is being replaced with a fixed cone valve and stainless liner after a leak was discovered. The leak inhibited SPU's ability to monitor turbidity in seepage - a vital indicator that the dam continues to be structurally sound. The project will also make a change to increase air flow to the valve. Accordingly, the US Bureau of Reclamation completed a physical model analysis to assess how the changes would affect flow in the spillway. The flow of air pulled to the valve chamber resulting from spill in the physical model was validated by a controlled spill exercise. The analysis confirmed the approach would work and revealed that the modification will allow SPU to safely operate the valve with substantial spill flow, exceeding a previously stipulated limitation for valve operation.

CEU Relevance Statement: Replacing a balanced-pressure principle needle valve with a fixed cone valve and stainless steel liner together with other modifications will increase the existing maximum discharge capacity for reservoir management and will also add the ability to release water through the valve while the reservoir is spilling via its overflow structure. These two factors will increase operational flexibility for managing spill to meet regulatory in-stream flow conditions while providing water supply. Use of a physical model analysis was critical to confirming feasibility and value of the replacement.

Author: Ulysses Hillard **Author's Job Title:** Senior Water Resources Engineer

Email: ulysses.hillard@seattle.gov **Phone:** 206.386.1518

Organization: Seattle Public Utilities

Primary Job Duties: I coordinate and manage Water Resources projects and programs for Seattle Public Utilities.

Related Prior Employment: I started my career doing engineering work firms whose primary work was on behalf of First Nations defending their water rights. I then joined a hydraulic engineering company that primarily supports transportation public works projects. I have worked my c

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Session ID: EngFAM05 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Whack-A-Mole: Waterproofing a 100-Year-Old Clear Well

Abstract: Albany, Oregon's Vine Street Water Treatment Plant, built in 1912, is a registered Oregon Historic Site. The clear well in the treatment plant is underground beneath a 2-story gravity filtration building. The City identified leakage through the 100-year-old concrete clear well—it leaked when filled, and infiltrate when empty, prompting structural and water quality concerns. An investigation was conducted to determine the infiltration sources. A solution had to withstand hydrostatic pressure acting on in both direction on the concrete structure. The solution involved fiber- reinforced shotcrete walls and poured in place floor. The repair also included epoxy injection and other methods to stop leaks. Repairing active leaks during construction proved to be challenging but was necessary for performance of the concrete liner. The project required close collaboration with the City, treatment plant operators, contractor, and design team to restore operation before critical summer months.

CEU Relevance Statement: This presentation provides a case study for both the assessment of historic structures and the rehabilitation of concrete storage tanks with infiltration concerns. The clear well is a critical facility for chemical contact time and storage for the City's water supply, and water quality was of upmost importance during design. Close coordination between operators, the City, and the design team was required to address WTP operations during construction and complete a reliable and operationally effective project.

Author: Matt Hickey **Author's Job Title:** Principal Engineer

Email: Matt.Hickey@murraysmith.us **Phone:** (503) 758-8234

Organization: Murraysmith

Primary Job Duties: Matt Hickey is a Principal Engineer and Water Resources Technical Services Lead for reservoirs. He manages water infrastructure projects of all sizes across the west coast, while being the Technical Advisor on many of Murraysmith's reservoir, waterline, and water treatment plant projects.

Related Prior Employment:

Registrations or Certifications: Professional Engineer, OR, WA

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Session ID: EngFAM06 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Both

Presentation Title: Replacement of 110,000 gpm of Pumping: Designed Solutions and Lessons Learned

Abstract: Key aspects of the design, bid-procurement and construction process for replacement of three pumps at the Multnomah County Drainage District Pump Station 1 responsible for maintaining flood protection for Portland International Airport will be presented. The project featured existing 1948 high-voltage motors replaced with medium voltage motors; manual power transfer switch for future mobile emergency generator; installation of variable frequency drives and Energy Trust of Oregon incentives of $448,000; new pumps with primary and secondary operating points; pump and contractor pre-qualification; and meeting dry-season milestones during the COVID pandemic. The project was completed in late 2020.

CEU Relevance Statement: The project has direct correlation to drinking water and wastewater pump stations improvements, operation and maintenance; especially aspects relating to raw water pumping, pump motors and variable frequency drives, procurement processes, Energy Trust of Oregon incentives, and maintaining space for operational flexibility and safety. Certified operators may learn pump selection, operation and maintenance information from this project directly applicable to replacement, operation and maintenance of equipment within their existing stations and systems. The project was completed simultaneously with bar rack cleaning rake replacement project and operators may see application to similar simultaneous projects at their facilities.

Author: Pat Van Duser **Author's Job Title:** Project Manager

Email: pat.vanduser@jacobs.com **Phone:** 503.705.3923

Organization: Jacobs

Primary Job Duties: Project Manager for drinking water and water-related projects at Jacobs focusing on design and construction of treatment plant and distribution system improvements including many in-water projects. Project Delivery Manager (Manager of Projects) for the Jacobs Oregon and SW Washington-Water portfolio of project managers and 100+ projects.

Related Prior Employment: Over 28 years continually increasing responsibility working as Engineer and Project Manager for MWH (Stantec) and Black & Veatch based out of the Portland, Oregon area.

Registrations or Certifications: Oregon PE 18936

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Session ID: EngFPM01 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Both

Presentation Title: Practical Applications for Transient Ground Shaking in the Design of Earthquake Resistant Welded Steel and Ductile Iron Pipelines

Abstract: Welded steel pipelines and restrained joint ductile iron pipelines typically perform well in earthquakes for transient ground shaking. In some instances, there are important aspects of transient ground shaking that should be considered as part of developing an earthquake resistant pipeline design. This presentation describes a practical approach for pipeline design and ground shaking that considers surface waves, the directionally of seismic waves, geologic conditions and site class, and higher stresses imposed on the pipe wall near bends

CEU Relevance Statement: In the Pacific Northwest, a major subduction zone fault exists that poses significant risks to the region and associated infrastructure. The earthquake produced from the full fault rupture is expected to be a magnitude 9.0 earthquake with several minutes of ground shaking. Few design sources describe well the practice needed to develop earthquake resistant pipelines. This presentation will identify some key considerations and approach for design of pipelines related to transient ground shaking.

Author: Mike Britch **Author's Job Title:** WWSP Engineering and Construction Manager

Email: mike.britch@tvwd.org **Phone:** 503-701-1343

Organization: Tualatin Valley Water District

Primary Job Duties: Engineering and Construction Manager for the Willamette Water Supply Program (WWSP). The WWSP is a $1.3 billion infrastructure program to deliver a new potable water supply to the Washington County area on the west side of the Portland metro area.

Related Prior Employment: Chief Engineer and Senior Engineer for TVWD. Prior to that worked for two design consulting firms in the Portland area.

Registrations or Certifications: P.E. and MPA. Member of AWWA and ASCE.

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Session ID: EngFPM02 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Both

Presentation Title: Seismic Design Quality Control Practice to Improve Overall Seismic Performance of Large Water Transmission System Pipelines and Facilities

Abstract: Seismic design of water infrastructure can be improved by well thought out quality control measures. Practical quality control measures for a large water transmission system have been developed to meet that need. This presentation describes those measures including development of minimum project specific seismic design requirements including limit states for welded steel pipelines, the use of checklist to be completed by the various designers to identify which seismic hazards exist within their project location and what they did to meet the minimum seismic design requirements, serviceability checks on cement mortar lining at double lap welded joints, the use of peer review to support critical seismic design elements, the development and use of geographic information system (GIS) tools in areas of high liquefaction potential and steep slopes to identify other potential nearby seismic hazards, and special considerations to address transient ground shaking under certain circumstances.

CEU Relevance Statement: Seismic design of pipelines and water systems is complex. Overall earthquake resistant design practice for water transmission pipelines and systems can be improved by well thought out seismic quality control measures. This presentation describes each of the seismic design quality control topics identified above, the practice of how they were employed, and resulting benefits to the project to improve the overall earthquake resistant design of the water system components.

Author: Mike Britch **Author's Job Title:** WWSP Engineering and Construction Manager

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Organization: Tualatin Valley Water District

Primary Job Duties: Engineering and Construction Manager for the Willamette Water Supply Program (WWSP). The WWSP is a $1.3 billion infrastructure program to deliver a new potable water supply to the Washington County area on the west side of the Portland metro area.

Related Prior Employment: Chief Engineer and Senior Engineer for TVWD. Prior to that worked for two design consulting firms in the Portland area.

Registrations or Certifications: P.E. and MPA. Member of AWWA and ASCE.

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Session ID: EngFPM03 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Both

Presentation Title: Seismic Resilience Without Breaking the Bank

Abstract: Want to improve the seismic resilience of your facilities without undergoing a major construction project and spending millions of dollars? The Portland Water Bureau (PWB) is midway through a low cost seismic upgrade of pump station electrical equipment throughout their distribution system. This presentation will discuss the design criteria, the field observations, the design and the implementation of the seismic improvements to improve the resiliency of the distribution system in a seismic event.

CEU Relevance Statement: The presentation will directly relate to engineering PDH through discussions of seismic resiliency. The presentation will relate to operations as we discuss the process of O&M replacement of electrical cabinets and seismic anchorage and the importance for seismic resilience.

Author: Matthew Perkins **Author's Job Title:** Structural Engineer

Email: matthew.perkins@stantec.com **Phone:** 5033125606

Organization: Stantec Consulting

Primary Job Duties: Matt has 14 years' experience in water infrastructure design with Stantec, he spends most of his time these days as the Project Technical Lead for the Design Team of the Portland Water Bureau's Filtration Facility project. Bryan is a mechanical engineer with over 25 years' experience in infrastructure design and project management. He has spent the past 15 years at the Portland Water Bureau, working in asset management, maintenance and construction, design, and the planning section.

Related Prior Employment: Not applicable, see Primary Job Responsibilities

Registrations or Certifications: Matt has professional engineering licenses in California, Oregon, Washington, and Hawaii, and a structural engineers license in Oregon. Bryan is a licensed engineer in the state of Oregon.

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Session ID: EngFPM04 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Both

Presentation Title: Optimizing Use of FEMA Funding – Gresham Grant Butte 10 MG Seismic Upgrades

Abstract: This reservoir upgrade and pipeline replacement project completed by the City of Gresham was identified in their Seismic Resiliency Plan—the first project that will get them closer toward their goal of achieving an overall seismically resilient water system. This presentation will cover alternatives evaluation and facility analysis to upgrade the City's 30-year-old, 10 MG prestressed concrete reservoir, which helped determined the most cost-effective approach and optimization of the funding provided through FEMA. The project included a geotechnical analysis and alternatives evaluation relative to piping upgrades for 3,100 feet of 24-inch transmission main to address pipe in seismic hazard areas. As a result of the alternatives analysis, the project team developed solutions that saved the City approximately $300,000, which allowed the City to complete other critical reservoir improvements.

CEU Relevance Statement: Seismic resilience has become a key talking point and design criteria for new and existing infrastructure in the Pacific Northwest. This presentation will address designs for making critical water system facilities seismically resilient. The upgrades include improvements to the reservoir, transmission piping, critical piping connections at structures, and an existing valve vault. The presentation will also discuss how control systems and operations can be improved to further advance seismic resiliency and the City's ability to respond to an earthquake.

Author: Matt Hickey **Author's Job Title:** Principal Engineer

Email: matt.hickey@murraysmith.us **Phone:** 503-758-8234

Organization: Murraysmith

Primary Job Duties: Matt leverages his technical expertise for the design of new reservoirs and the assessment of existing reservoirs to become the firm's go-to resource for reservoir projects. Matt currently serves as Murraysmith's Reservoir Technical Lead and is a resource for Murraysmith's offices across the firm.

Related Prior Employment:

Registrations or Certifications: Professional Engineer in Oregon and Washington

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Session ID: EngFPM05 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Streamlined Pipeline Seismic Design - Geotechnical and Pipeline Modeling for An Essential Pipeline Project

Abstract: This paper presents a case study of the use of a 2D geotechnical modeling to evaluate the pattern and magnitude of the seismic ground deformation and the use of a 3D pipe-soil interaction finite element model to evaluate the seismic performance and design of a critical creek crossing (Beaverton Creek Crossing) for WWSP PLW-2.0 water pipeline. Approximately 10 feet of seismically induced permanent ground deformation is estimated, resulting from soil liquefaction. The NPS 48, steel, butt-welded pipeline will be installed via open cut and two trenchless drives. Based on the results of the paired geotechnical and pipe modeling, appropriate adjustments to the pipe wall thicknesses and alignments were selected in areas to coup with and to reduce high seismically induced strains. In the end this crossing was able to designed to satisfy the seismic resilience goal without the use of expensive and time-consuming ground improvements.

CEU Relevance Statement: By using innovative numerical modeling approaches, the seismic hazards and seismic pipe performance were thoroughly evaluated. The required seismic resilience goal can be achieved for this critical crossing. Therefore, reducing operation, maintenance and repair cost for this essential pipeline project.

Author: Wolfe Lang **Author's Job Title:** Principal Engineer

Email: lang@mcmjac.com **Phone:** 15033842919

Organization: McMillen Jacobs Associates

Primary Job Duties: Principal Engineer and Geotechnical Practice Lead for McMillen Jacobs Associate. Job focus is on geotechnical engineering, seismic hazard and resilience evaluation for water and wastewater projects.

Related Prior Employment: Previously worked in Shannon & Wilson, Inc.

Registrations or Certifications: Professional Engineer in OR and WA; Registered Geotechnical Engineer in OR; P. Eng. in BC and ON, Canada

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Session ID: EngFPM06 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Where's the Backbone? Installing New Watermains to Create a Seismically Resilient Backbone Through Distribution Systems

Abstract: TVWD's Master Plan had identified a much needed fire-flow improvement project to a growing and developing part of the District. Route selection, modeling, schedule, future maintenance, seismic design requirements (including earthquake pipe), and other factors were all considered to complete the project. This presentation will walk through the options evaluated, and provide lessons learned through design and installation of a new seismically resilient fireflow backbone to a portion of the TVWD service area.

CEU Relevance Statement: For modeling of the system, key connections points were made to help strengthen the water system. Locations of connections were a primary concern regarding operation and maintenance activities, as parts of the old system are nearly unmaintainable. The new waterline is entirely restrained and includes special EQ joints to allow pipes on steep slopes to move and keep the water system in place.

Author: Andrew Barrett **Author's Job Title:** Senior Engineer

Email: andrew.barrett@tvwd.org **Phone:** 503-848-3091

Organization: Tualatin Valley Water District

Primary Job Duties: Senior Engineer at TVWD, focusing on large capital project delivery including waterlines, reservoirs, and pump stations.

Related Prior Employment: I have worked at TVWD for 4 years, City of Beaverton for 9 years, and private consulting for 6 years. My focus has been on many different portions of Civil Engineering including site civil design, sewer and storm water systems, water, and street design.

Registrations or Certifications: Oregon PE since 2007

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Session ID: PIFAM01 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Both

Presentation Title: What You and Your Community Need to Know About WIFIA

Abstract: Environmental Protection Agency's Water Infrastructure Finance & Innovation Act (WIFIA) loan program has outsized benefits for utilities and the community they serve. These benefits can have generational impact and should be communicated strategically, throughout a project's life cycle to community members, elected officials, and utility staff. Our staff has supported more than $1.6B in WIFIA loan Letters of Interest, subsequent applications, and ratepayer communications. This presentation covers what utilities and their community should know about WIFIA. 1. What is WIFIA? What projects are eligible? Who gets funded? 2. What are the benefits to ratepayers of WIFIA loans -- and how do you communicate them? 3. Who needs to know? Getting the message out to elected officials, community organizations, and others.

CEU Relevance Statement: Attaining funding to replace ageing infrastructure is a critical step in the process of delivering safe drinking water. It is critical that utility managers and public officials gain an understanding of the available low interest federal funding, as it is the first step in saving ratepayers millions of dollars. Every utility in the US should know about this opportunity to ensure safe drinking water for the next generation.

Author: Kim Marshall **Author's Job Title:** Senior Associate

Email: kimmarshall@barneyandworth.com **Phone:** 9712265928

Organization: Barney & Worth

Primary Job Duties: Consultant developing communications and strategic plans for utilities.

Related Prior Employment: Financial manager at the Washington Aqueduct, wholesale water supplier in Washington, DC. Vice President of Blue Drop, a non-profit entity formed by DC Water to identify and capitalize on alternative revenue sources.

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Session ID: PIFAM02 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Modernizing the Cross Connection Control Program Reporting, Compliance, and Communications to Meet 21st Century Needs

Abstract: Presentation Outline: Use of web-based software to track backflow assemblies, test results, and compliance; Online, paperless test report submission; Customer notification built into system. Supplemental education and outreach; Use of webinar, website, social media to support customer awareness and compliance with testing requirements; Customer Outreach through notifications and proactive site inspections. Subscription based backflow testing; Contract testing program administered by the water provider that offers customer convenience; Customers who elect this service receive an annual $35 testing fee, and a $50 credit should their device require repairs/replacement.

CEU Relevance Statement: This information will assist water providers with useful tools on how to optimize management of a cross connection program and the related backflow testing requirements through multiple phases, including enforcement and compliance. Although cross connection contamination events are rare, they have the potential to have serious adverse impacts on public health and the water utility's trust with the public. Communicating with customers and the general public has become more challenging and divisive. This presentation will outline how using web-based software and regular communication to the public, agencies can streamline some of the repetitive tasks involved, such as backflow test report submission, data management, and targeted notifications to customers. The end result streamlines the enforcement process with fewer customers having services interrupted for non-compliance while achieving greater public health protection for the community.

Author: Joel Cary **Author's Job Title:** Water Resources Division Manager

Email: Joel.cary@tvwd.org **Phone:** 503 369-4490

Organization: Tualatin Valley Water District

Primary Job Duties: Joel Cary is the Water Resources Division Manager for Tualatin Valley Water District (TVWD) and the General Manager of the Willamette River Water Coalition, a collection of agencies with shared water rights. He oversees water quality, regulatory compliance, cross connection control, water rights, and watershed planning activities for the District and its various partnerships serving Washington County, Oregon. He has over 20 years of experience in the water sector and holds treatment, distribution, and cross connection specialist certifications.

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Related Prior Employment:

Registrations or Certifications: Distribution 4, Treatment 1, Cross Connection

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Session ID: PIFAM03 **Date:** 4/29/2022 **Length of Session:** 60 minutes

Area of Relevancy: Both

Presentation Title: Water Workforce Development Through the Education Pipeline

Abstract: Presenters will discuss current Workforce issues on a large scale, using EMSI data. They will then focus in on how the larger picture applies to workforce development in water careers, and how water agencies can work with their school districts, colleges, Chambers of Commerce and businesses for development of future water industry workers (operators and other water fields). Includes examples of programs to connect water agencies with schools and an overview of the newly-developed DRIP Program.

CEU Relevance Statement: This presentation will address how agencies should work with partners to develop and/or implement programs for workforce development in the Water Industry, especially the positions of distribution and treatment operators. The focus is not on current operations, but to ensure the ability of future water operations, including the importance of ensuring competent outcomes for the protection of public health. Presenters want to encourage current operators to work together on developing Career Technical Pathways to provide future operators with the skills and knowledge necessary to achieve operational certification to be able to perform essential duties in water.

Author: Tacy Steele **Author's Job Title:** Water Program Manager

Email: tacy.steele@hillsboro-oregon.gov **Phone:** 503-936-1086

Organization: City of Hillsboro

Primary Job Duties: Water Policy and Program Development

Related Prior Employment: 26 years at City of Hillsboro working in various water positions, including utility billing, engineering tech positions, water resources and administration

Registrations or Certifications: D1 Certification, Teaching Certification

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Session ID: PIFAM04 **Date:** 4/29/2022 **Length of Session:** 60 minutes

Area of Relevancy: Both

Presentation Title: Excellence in Communications Awards Show & Tell

Abstract: Winners of the Excellence in Communications Awards will make short presentations about their projects.

CEU Relevance Statement: Awards are relevant to these CEU criteria, so presentations will share the best of the Pacific Northwest about: COVID-19 information developed for external and internal audiences, Public education materials developed by/for operators, public education about HABs and other water source concerns, public education required by drinking water regulations, Public education required by drinking water regulations (not be water resource or environmental protection departments), Writing and executing strategic plants for capital projects, emergency response, etc

Author: Kim Marshall **Author's Job Title:** Senior Associate

Email: kimmarshall@barneyandworth.com **Phone:** 9712265928

Organization: Barney & Worth

Primary Job Duties: Consultant developing communications and strategic plans for utilities.

Related Prior Employment: Financial manager at the Washington Aqueduct, wholesale water supplier in Washington, DC. Vice President of Blue Drop, a non-profit entity formed by DC Water to identify and capitalize on alternative revenue sources.

Registrations or Certifications:

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Session ID: WQTFAM01 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Pilot Testing for Iron and Manganese Removal: Successes and Challenges for Two Water Districts

Abstract: Pilot testing provides a unique opportunity for utilities to determine cost-effective treatment solutions for water quality concerns prior to facility design and construction. Facing elevated iron and manganese concentrations, two water districts—Rockwood Water People's Utility District (RWPUD) and Thurston Public Utility District (TPUD)— conducted pilot scale studies at various sites using manganese dioxide filter media. Using either one-stage or two-stage filtration with sodium hypochlorite and potassium permanganate injected into the raw water, and treatment optimization via adjustments to loading and chemical dosing rates, pilot tests achieved successful removal of both iron and manganese below the secondary maximum containment levels (0.3 mg/L for iron and 0.05 mg/l for manganese) at all sites. This presentation will review troubleshooting techniques used and the lessons learned from pilot testing multiple groundwater sources.

CEU Relevance Statement: The information provided in this presentation will provide a road map for utilities experiencing similar water quality issues and will highlight how pilot testing can provide useful insight to the planning and design of treatment infrastructure. Pilot testing allows water agency management to make confident decisions related to water treatment infrastructure planning. The presentation will also benefit operators and maintenance staff who may have questions regarding the treatment process and optimization of treatment strategies.

Author: C. Aaron Gress **Author's Job Title:** Civil Engineer

Email: aaron.gress@murraysmith.us **Phone:** 559-679-2986

Organization: Murraysmith

Primary Job Duties: Aaron is a civil engineer and project manager for water treatment design projects. He is responsible for conducting pilot testing and developing pilot testing reports and preliminary design criteria for planned water treatment infrastructure.

Related Prior Employment:

Registrations or Certifications: Professional Engineer Licensed in Oregon and California

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Session ID: WQTFAM02 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Process Control and Treatment Optimization for Groundwater with Elevate Ammonia and Manganese

Abstract: After working with the community to acquire and make needed improvements to the Warm Beach drinking water system, Snohomish PUD engaged Confluence to optimize treatment. The facility consists of catalytic-oxidation filtration for manganese (Mn) removal, treating water with 2 mg/L total ammonia and 0.6 mg/L total Mn. The facility has historically been operating without fully oxidizing ammonia (below breakpoint), filters were not performing well in removal of Mn (filter effluent Mn was exceeding the secondary MCL), and other issues such as filter backwash and run times were sub-optimal. The presentation will discuss how engineers and operators diagnosed treatment faults with bench and pilot testing, recommended adjustments to treatment which included further bench/pilot testing and improvements to on-line monitoring and SCADA process control, and monitored implementation of treatment improvements to reduce Mn and reliably achieve free chlorine in treated water.

CEU Relevance Statement: The presentation discusses strategies to meet regulatory compliance, how to improve operations and maintenance of a poorly-performing groundwater treatment plant, and the management decisions required to implement these improvements.

Author: Alex Mofidi **Author's Job Title:** Senior Project Manager

Email: alex@confluence-engineering.com **Phone:** 2068664562

Organization: Confluence Engineering Group, LLC

Primary Job Duties: Alex is a 30-year AWWA member and Senior Project Manager at Confluence completing various water treatment, distribution system, and premise plumbing optimization projects. He regularly provides water treatment training to operators.

Related Prior Employment: Alex worked for MWD Southern California for 16 years, Water Quality and Treatment Solutions for 2 years, AECOM for 8 years, and has been with Confluence for 4 years.

Registrations or Certifications: Registered PE in CA, WA, ID, OR, TX; Licensed CA water treatment operator (T3).

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Session ID: WQTFAM03 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Implementation of Taste & Odor Improvements at Scotts Valley

Abstract: Sulfides are frequently present with iron and manganese and can cause significant taste and odor issues. The Orchard Run WTP was only partially removing sulfides from the water using air stripping and chlorine oxidation. The District implemented improvements including biological treatment of the stripped foul air and GAC treatment of the filtered water to improve customer satisfaction.

CEU Relevance Statement: Improve operators understanding of hydrogen sulfide treatment options to improve the treated water quality.

Author: Milt Larsen **Author's Job Title:** Principal Engineer

Email: miltlarsen@kennedyjenks.com **Phone:** 2538356401

Organization: Kennedy Jenks Consultants

Primary Job Duties: Project Manager and process engineer responsible for water quality and corrosion control evaluations and water treatment design.

Related Prior Employment:

Registrations or Certifications: Professional engineer licensed in Washington, Oregon, & Hawaii

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Session ID: WQTFAM04 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Converting an Unchlorinated System to Full Chlorination/Arsenic/Manganese Treatment

Abstract: Olympic Water and Sewer, Inc. (OWSI) operates the unchlorinated water system for Port Ludlow, a community of approximately 1,500 connections on the Olympic Peninsula served by five wells. The system was required by Washington Department of Health to transition to chlorination due to coliform detections. Chlorination then triggered other design challenges regarding existing manganese and arsenic issues. This presentation discusses the planning, design, and commissioning of a 620 gpm groundwater treatment plant for two of the wells and three chlorination stations at the remaining three well sites. The project received funding through the Drinking Water State Revolving Fund (DWSRF). This presentation will also discuss the loan application process.

CEU Relevance Statement: This project is in response to a utility's need for chlorination conversion along with other treatment to provide clean and safe drinking water to their community and a need for funding. This presentation will provide an overview of treatment process selection, funding, design, construction, and start-up.

Author: Beth Mende **Author's Job Title:** Water/Wastewater Engineer

Email: Elizabeth.mende@hdrinc.com **Phone:** (909) 528-1002

Organization: HDR, Inc.

Primary Job Duties: Beth is a professional engineer with experience in surface water and groundwater treatment plant process design and operations, laboratory analytics, water quality management and regulatory compliance, and system piping and hydraulic designs.

Related Prior Employment:

Registrations or Certifications: Professional Engineer

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Session ID: WQTFAM05 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Managing Legacy Manganese in Distribution Systems

Abstract: Manganese (Mn) accumulates in distribution systems, leading to legacy deposits. Under various routine system conditions, legacy Mn can be destabilized and released, leading to a host of adverse water quality conditions at the tap. This presentation will describe the issue and provide utility guidance on how to self-assess for manganese accumulation, and strategies for monitoring, mitigation, and control.

CEU Relevance Statement: Accumulated manganese deposits in distribution systems present water quality risks (both public health and aesthetic). Many utilities regard manganese as "in=out" and are unaware of the phenomena of accumulation/release, the degree to which manganese accumulates and can be destabilized under routine conditions, and the relative ineffectiveness of flushing as a control strategy. This presentation will illuminate these issues and provide practical utility guidance on how to self-assess for manganese accumulation, and strategies for monitoring, mitigation, and control.

Author: Andrew Hill **Author's Job Title:** Senior Project Manager

Email: andrew@confluence-engineering.com **Phone:** 2068544125

Organization: Confluence Engineering Group LLC

Primary Job Duties: Engineering and project management related to planning, research, treatment, and source-to-tap evaluation of water quality issues.

Related Prior Employment: 22 years of consulting engineering in the drinking water field.

Registrations or Certifications: Professional Chemical Engineer (PE) in Washington and California

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Session ID: WQTFAM06 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Investigating Manganese Accumulation, Release, and Mitigation in Tacoma Water's Large Diameter Transmission Mains

Abstract: Tacoma Water began operating the Green River Filtration Facility (GRFF) in December 2014. Although the GRFF produces Mn and Fe below the secondary maximum contaminant levels (SMCLs), and significantly below pre-filtration levels, the Regional Water System Supply (RWSS) Partners have reported Mn-associated discolored water issues and customer complaints in areas served from P5. A detailed evaluation of available flow and turbidity data was conducted, and a year-long coordinated monitoring plan was implemented at turnouts along P5, and within Tacoma Water and RWSS Partner distribution systems. The approach, findings, and recommendations for minimizing discolored water and Mn release events along P5 will be presented.

CEU Relevance Statement: Risks of distribution system accumulation and release events depend on numerous system- and site-specific factors such as: historical source water loading, on-going loading and reactions with bulk water chemistry, amount and nature of legacy accumulation, utility maintenance practices (e.g., flushing), and source water chemistry and hydraulic change patterns. Each of these elements was evaluated during the study, and a coordinated monitoring plan was developed and implemented to fill key data gaps. Mitigation strategies that are currently under evaluation by Tacoma Water include further optimization of treatment processes to minimize seasonal Mn breakthrough, assess various large diameter main cleaning processes including hydraulic and mechanical approaches, identify flow regimes to minimize release events, and ongoing data collection and evaluation. These topics will be discussed.

Author: Melinda Friedman **Author's Job Title:** President

Email: melinda@confluence-engineering.com **Phone:** 2062801709

Organization: Confluence Engineering Group, LLC

Primary Job Duties: Oversee strategic planning, management, and personnel at Confluence Engineering Group, LLC, a nine person water quality engineering firm.

Related Prior Employment: Water Quality Program Manager at HDR Engineering and at Economic and Engineering Services, Inc.

Registrations or Certifications: Washington State PE

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Session ID: DivFAM01 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Both

Presentation Title: Using Data to Drive Water Equity

Abstract: Xylem recently developed a water equity analytical tool for utility managers to measure how their utility is doing along multiple water equity measures, it is called the Water Equity Lens. The Water Equity Lens is a spatially-explicit web-based app that maps the US Water Alliance Water Equity Pillars of: 1) Access, 2) Benefits, and 3) Resilience by census tract.

CEU Relevance Statement: Utility Managers can use the Lens to understand their water equity performance, according to benchmarks developed per equity pillar and across their communities. It overlays water equity indicators with census tract attributes to provide context around drivers of disparity. The problem the Water Equity Lens aims to solve is: a lack of visibility, within a utility, of how programs and investments are distributed across the service area, according to equity criteria. A common refrain from community advocacy groups is that poorer areas of the city have lower service levels. Many utility leaders also say that they lack an empirical basis to measure how they are doing on water equity performance, and lack data to understand how their programs and investments differentially impact communities. Join this session to learn about how utilities in the PNW and cross the country are measuring water equity using this tool.

Author: Christine Boyle **Author's Job Title:** Vice President of Business Incubation

Email: christine.boyle@xylem.com **Phone:** 206-979-1002

Organization: Xylem

Primary Job Duties: Early-stage product development and go to market for digital water solutions.

Related Prior Employment: Founder and CEO, Valor Water Analytics (2013-2018); Research Associate, Environmental Finance Center at University of North Carolina Chapel Hill (2007-2012)

Registrations or Certifications: PhD

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Session ID: DivFAM02 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Both

Presentation Title: A Utility Starts Its Equity Journey

Abstract: In 2021, the City of Hillsboro established racial equity as a citywide priority, coinciding with development of the Water Department's Strategic Plan. Hillsboro Water took advantage of the opportunity to integrate equity into the strategic planning process and their everyday work. Initial work includes developing a process for applying the City's equity lens to infrastructure programs, integrating equity into capital project prioritization, and seeking opportunities to diversify department staff. This presentation offers lessons learned that will provide a good starting point for utilities just starting on their equity journey, as well as ideas for utilities with more established programs.

CEU Relevance Statement: N/A

Author: Lee Lindsey **Author's Job Title:** Water Business and Administration Manager

Email: lee.lindsey@hillsboro-oregon.gov **Phone:** 503-615-6702

Organization: City of Hillsboro

Primary Job Duties: Water Business and Administration Manager works on annual budget, rate setting, CIP, debt financing, etc.

Related Prior Employment: Previously, Vice President for Administrative Services, Redwoods Community College District

Registrations or Certifications:

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Session ID: DivFAM03 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Both

Presentation Title: Maximizing Water Management Dollars While Bringing Transparency, Equity, and Multiple Benefits

Abstract: There is broad recognition that adapting to climate change, coupled with the need to address aging infrastructure and population growth, will require public and private investments in water management, ranging from restoration to efficiency to supply diversification. In addition to meeting water-related objectives, many of these strategies can also provide important co-benefits, such as reducing energy use, providing habitat, and enhancing community livability. While there is acknowledgment that these strategies provide multiple benefits, water managers lack the resources and tools necessary to systematically incorporate co-benefits into decision-making processes. This presentation will offer an adaptable framework designed to incorporate multi-benefits into water management decision-making processes. Case studies from cities and utilities around the country will be included.

CEU Relevance Statement: Effectively comparing water management and investment options requires careful consideration of the costs and benefits associated with each strategy. The Pacific Institute's multi-benefit framework provides a systematic approach for the careful consideration of the benefits and tradeoffs of water-related projects, programs, and policies, while allowing flexibility for application to a specific region, interest, or query. This presentation will focus on the application of the framework to several test cases. The first test case focus prioritizing stormwater projects funded by voter-approved bond funds in southern California. The second test case examines the multiple benefits of rain capture systems on residential properties in Austin, Texas. We will present the co-benefits identified for each test case as well as the methods used for identifying the benefits, prioritizing, and quantifying and qualifying co-benefits.

Author: Morgan Shimabuku **Author's Job Title:** Research Associate

Email: mshimabuku@pacinst.org **Phone:** 503-975-1623

Organization: Pacific Institute

Primary Job Duties: Morgan Shimabuku joined the Pacific Institute in 2018. She conducts primary and secondary research on a broad variety of topics including water policy, utility affordability, and water resilience.

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Related Prior Employment: Prior to joining the Pacific Institute, Morgan was a senior program manager at an environmental nonprofit where she ran residential and commercial water conservation program operations in partnership with municipal water providers. Previously, she worked

Registrations or Certifications: B.A. in Environmental Studies and Geology from Whitman College; M.A. in Physical Geography from the University of Colorado-Boulder

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Session ID: DivFAM04 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Both

Presentation Title: Integrating Social Equity Into the Bull Run Treatment Projects

Abstract: Portland Water Bureau's Bull Run Treatment Projects will remove pathogens, reduce lead concentrations at the tap, and make Portland's water supply more reliable during an earthquake or other disaster. While water quality and resilience are themselves important equity investments, the Water Bureau has proactively worked to align the projects with the Water Bureau's Plan to Advance Equity, Diversity and Inclusion. Those efforts include engaging urban indigenous communities and other underrepresented populations, creating business and employment opportunities for women and people of color, and reducing barriers to a more diverse, future workforce at the filtration facility. This presentation will share lessons learned for other utilities seeking to integrate social equity into their capital project.

CEU Relevance Statement: This presentation addresses the planning and design of water treatment facilities to best meet the needs of both utility staff and the served community. This presentation will include best practices for facilities planning and design, including planning for the demographics of future operations staff, managing facilities to maintain a good relationship with the community, and developing a future workforce.

Author: Nicki Pozos **Author's Job Title:** Principal

Email: nicki@theformationlab.com **Phone:** 503-481-8611

Organization: The Formation Lab

Primary Job Duties: Dr. Pozos is an engineering consultant focused on integrating social equity into the planning, design and management of water infrastructure projects. Her current consulting projects include the City of Tualatin Water Supply Strategy, Portland Water Bureau's Bull Run Treatment Projects, the Regional Disaster Planning Organization Emergency Water Plan, and the Portland Bureau of Environmental Services Secondary Treatment Expansion Project.

Related Prior Employment: Dr. Pozos bring almost 20 years of experience including water master planning, water supply planning, economic evaluation, decision management, strategic communications and social equity. Prior to The Formation Lab, Nicki held positions with Barney & Wort

Registrations or Certifications: Professional Engineer, Oregon and California

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Session ID: DivFAM05 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Both

Presentation Title: Communicating with Engineers - Getting Operators and Engineers to Understand Each Other

Abstract: The presentation is a designed to improve communication between operators and engineers. It points out the differences between the two groups but also the similarities of working toward a common goal. It will provide tools for both groups to use as well as insight into each other's worlds.

CEU Relevance Statement: Understanding each other is critical for both engineers and operators if capital projects are to be completed well. Failures in communication lead to misunderstandings, misunderstandings lead to mistakes, and mistakes lead to cost overruns and time delays. This presentation attempts to provide ways to build good communication lines.

Author: Michael Grimm **Author's Job Title:** General Manager

Email: mgrimm@wswd.org **Phone:** 5037290544

Organization: West Slope Water District

Primary Job Duties: As the District's General Manager, I am responsible for leadership and strategic planning of engineering and operational tasks.

Related Prior Employment: 2015 - Present: General Manager, West Slope WD; 2013 - 15: Consulting Engineer, Aquamize, LLC; 2009 - 2013: Senior Water/Project Engineer, The Cadmus Group; 2004 - 09: Senior Water Engineer, City of Gresham/Sunrise Water Authority

Registrations or Certifications: Registered Professional Engineer in Oregon since 1989; 36-year AWWA Individual Member

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Session ID: DivFAM06 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Both

Presentation Title: Strategies to Diversify Our Present and Future Workforce

Abstract: Our communities are becoming more diverse and the King County Wastewater Treatment Division (WTD) recognizes the benefits of and the need to diversify its workforce to keep pace with that change. There is a great deal of research showing the benefits of diversity within organizations. Results include innovation, increased productivity and more adaptability toward completing work. Adaptability is a byproduct of varying backgrounds and perspectives which lead to greater ideas, insights, solutions. WTD has undertaken several internal and external recruitment and employee development strategies to create and maintain a highly skilled and efficient workforce. These strategies are broad in scope, including a focus on gender, underrepresented racial groups, and other historically marginalized groups.

CEU Relevance Statement: N/A

Author: Robert Tovar **Author's Job Title:** Equity, Inclusion & Belonging Manager

Email: robert.tovar@kingcounty.gov **Phone:** 206-477-5374

Organization: King County Wastewater Treatment Division

Primary Job Duties: Robert Tovar is the Equity, Inclusion & Belonging Manager for King County's Wastewater Treatment Division (WTD). As a 20-year employee of WTD, Robert has held a variety of positions and has more than 30 years of experience in leadership, management, and organizational development and consulting. Robert's professional experience includes leadership development, training design and delivery, equity and social justice, operational management, conflict resolution and organizational development. He is trained in a variety of group facilitation and training methods and is certified as an Interest Based Bargaining Facilitator, Cultural & Interpersonal Development trainer and Interpersonal Communication Trainer.

Related Prior Employment:

Registrations or Certifications:

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Session ID: ResFAM01 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Water Rights Mitigation Pilot Project - Challenge, Status, and Opportunity.

Abstract: The Washington State Legislature included a provision in ESSB 6091 to create a legislative task force examining current challenges faced in water right acquisition by municipal water purveyors. In addition to the task force, the legislature authorized 5 public agencies to serve as pilot projects demonstrating real world situations and the potential opportunities for considering Net Ecological Benefits when evaluating water right applications. The presentation will describe the challenges, current status, and opportunities associated with the City of Sumner role as one of those five pilot projects.

CEU Relevance Statement: The process of applying for and obtaining water rights is a vital component in water system planning that is required by state regulations. This presentation will describe the current challenges inherent to the process, the current state of legislative efforts to address those issues, and lessons being learned by one particular City navigating through their water rights applications.

Author: Jason Van Gilder **Author's Job Title:** Associate City Engineer

Email: jasonv@sumnerwa.gov **Phone:** 253-299-5703

Organization: City of Sumner

Primary Job Duties: Engineering support of the City's Water and Wastewater Utilities

Related Prior Employment: Previously a Utility Engineer for the Muckleshoot Public Works Department. Approximately 16 years of prior work as a consultant engineer with Cosmopolitan Engineering Group and Hedges Engineering & Consulting, Inc..

Registrations or Certifications: Professional Engineer (Washington), Project Management Professional (PMI), Certified Public Manager (ASPA), WDM II & WTPO II (WA DOH)

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Session ID: ResFAM02 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Both

Presentation Title: Snoqualmie Pass Utility District – Water Right Portfolio Optimization

Abstract: The Snoqualmie Pass Utility District issued a self-imposed building moratorium due to limited annual quantity available under its existing water rights and corresponding water supply wells. To address the moratorium, the District proposed several projects to optimize use of their current water right portfolio. First, the District has applied to the Washington State Department of Ecology to process four water right change applications to facilitate a wellfield consolidation. The changes would allow the District the operational flexibility necessary to meet existing water demands. Second, the District has applied for a new mitigated water right to withdraw groundwater from wells sited in Kittitas County, mitigated with discharge of foreign effluent return flow. This presentation will discuss the water management schemes; multiple line of evidence approach used to determine mitigation suitability; and the collaborative approach with basin stakeholders used to develop a mitigation plan.

CEU Relevance Statement: Building moratoriums are becoming more common as legacy water right permits are perfected. Understanding of the regulatory scheme(s), optimization of existing water rights, and determination of mitigation requirements for new water rights is critical in long-term water right portfolio management. Water system operators need to understand regulatory requirements – including application of current case law – and water right mitigation complexities to satisfy current and long-term growth within their service area.

Author: Tyson Carlson **Author's Job Title:** Sr. Associate Hydrogeologist

Email: tcarlson@aspectconsulting.com **Phone:** 2066961525

Organization: Aspect Consulting

Primary Job Duties: Hydrogeologist

Related Prior Employment: Aspect Consulting

Registrations or Certifications: CWRE, LHG

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Session ID: ResFAM03 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: How Small Water Providers Are Using ASR to Help Manage Supplies

Abstract: Aquifer storage and recovery (ASR) is a water management tool that diverts and stores water when it is abundant for use later when it is needed. Most ASR projects in the Pacific Northwest are high-volume systems that have been implemented by large municipalities with ASR wells yielding up to (or in excess of) 1 million gallons per day (MGD) and storage capabilities in excess of 100 million gallons (MG). But, small-scale ASR systems have become an increasingly common way to manage water supplies. Small-scale ASR projects are subject to the same technical geologic and geochemical feasibility constraints as larger systems, but use wells with lower yields and storage volumes. This presentation will include case studies from the City of Cornelius, Liberty High School, and Orchard Heights Water Association to demonstrate the drivers and benefits of implementing a small scale ASR project.

CEU Relevance Statement: This presentation will provide an overview and framework for water providers to identify the drivers that may influence small-scale ASR feasibility in their region, and demonstrate the benefits of a small-scale ASR system. Managers, operators, and engineers will learn about several factors that inform the decision to invest in ASR for managing limited water supplies.

Author: Ellen Svadlenak **Author's Job Title:** Staff Hydrogeologist

Email: esvadlenak@gsiws.com **Phone:** 5032695661

Organization: GSI Water Solutions, Inc.

Primary Job Duties: Ellen is currently managing a data collection and analysis project for the City of Cornelius's ASR program. She has a background in hydrogeology, geochemistry, water quality monitoring, and data analysis.

Related Prior Employment: Ellen has 6 years of experience in natural resources management (including in forestry and geologic research), and has worked as a hydrogeologist at GSI Water Solutions, Inc., for the past 2 years.

Registrations or Certifications: Geologist in Training/GIT (OR)

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Session ID: ResFAM04 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Three for the Price of One - Using Aquifer Storage and Recovery to Reduce Peak Demands, Increase Storage, and Meet Emergency Backup Requirements.

Abstract: The City of Cornelius completed construction of an aquifer storage and recovery (ASR) facility in late 2017 to provide a second supply source for their water system. The city purchases more water from Hillsboro during the winter months, injecting the excess underground for storage using the ASR well. The stored water will be pumped from the ASR well during the summer's peak demand period, thereby shaving the load from the JWC's water treatment plant. The use of the ASR well will reduce peak withdrawals from Hillsboro, address a significant portion of the City's storage needs, and provide an emergency backup supply.

CEU Relevance Statement: The City of Cornelius began construction of an ASR facility in early 2017. Key components of the project include the wellbore, a control building, a chemical storage building for disinfection, and an emergency generator. City staff operate, maintain, and manage the system which includes collecting water samples, monitoring field parameters, and operating a chemical dosing system. Water recovered from the ASR well is pumped into the city's potable water distribution system. As such, the city is responsible for monitoring and maintaining the required water quality parameters.

Author: Randy Mueller **Author's Job Title:** Project Manager

Email: randy.mueller@jacobs.com **Phone:** 503-956-5723

Organization: Jacobs

Primary Job Duties: Project manager and engineer delivering and designing both potable water and wastewater treatment and pumping facilities. Additional experience designing HVAC systems for advanced facilities and commercial buildings.

Related Prior Employment:

Registrations or Certifications: Professional Engineer, State of Oregon and Washington

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Session ID: ResFAM05 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: City of Othello Aquifer Storage and Recovery: Source Treatment and Program Implementation

Abstract: The City of Othello has been developing an Aquifer Storage and Recovery (ASR) program since 2016 to augment declining groundwater supplies and support future growth. With no conventional surface water sources available, the City entered into a Water Service Contract with the Bureau of Reclamation to obtain water from the Columbia Basin Irrigation Project to supply source water for ASR program. In the spring of 2021, the City constructed new source water diversion and treatment facilities, obtained initial permitting, retrofitted a deep groundwater well, and began recharging a deep aquifer using these new source water facilities. This presentation will provide an overview of the City's ASR program development and describe the operations, challenges, and performance of recent ASR operations.

CEU Relevance Statement: This presentation will present the tactics used for program development through funding and coordination with State Agencies, and the technical approach to designing, constructing, permitting, and operating an Aquifer Storage and Recovery program to improve water supply availability and redundancy. Considerations for water quality, treatment technologies, and well and distribution system hydraulics will be presented.

Author: Andrew Austreng **Author's Job Title:** Associate Hydrogeologist

Email: aaustreng@aspectconsulting.com **Phone:** 2068385843

Organization: Aspect Consulting

Primary Job Duties: Andrew is an associate hydrogeologist with Aspect Consulting. His practice focuses on water supply development and expansion, with emphasis on sustainable management policies. He works with municipalities, regulators, and irrigation districts on commercial and municipal projects, including source assessment and exchange, well installation and permitting, and water rights processing.

Related Prior Employment:

Registrations or Certifications:

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Session ID: ResFAM06 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Condition Assessment of a 100-Year Old Well Station

Abstract: The City of Spokane (City) recently completed a comprehensive and innovative condition assessment of their century-old Hoffman Well Station to evaluate alternatives for regaining lost production capacity from one of the station's two caisson wells (Well 2). Well 2 has been out of service since 1993 due to concerns regarding the structural integrity of its brick caisson wall. Results from a 2018 inspection survey of Well 2 suggest that some minor deformation has taken place during the last 25 years, particularly in the middle and lower portions of the brick caisson. Based on the study's analyses and findings, the City identified a preferred alternative to renovate Well 2 and restore groundwater production from the well station back to its original capacity of 11,000 gallons per minute.

CEU Relevance Statement: This presentation will describe the importance of routine well condition inspections to maintain safe and reliable operations and production capacities. The presentation will share what the City found during a routine inspection of one of their well stations, what conventional and unconventional survey technologies were used to perform the inspections, and what measures the City is taking to repair the source and extend its service life.

Author: Kenny Janssen **Author's Job Title:** Principal Hydrogeologist

Email: kjanssen@gsiws.com **Phone:** 9712008530

Organization: GSI Water Solutions, Inc.

Primary Job Duties: Kenny has 17 years of experience planning and conducting groundwater supply, storage, and resource management investigations primarily for municipalities. His primary job responsibilities include client and business development; project development, management, and delivery; coaching and mentoring junior staff; and senior technical reviews.

Related Prior Employment:

Registrations or Certifications: Kenny began his consulting career as a hydrogeologist with Golder Associates, Inc. before joining GSI. Prior to consulting, Kenny worked for the USGS and USFWS as a hydrologic technician.

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Session ID: ResFPM01 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: All in One: The Benefits of Integrating Comprehensive Long-term Water Supply, Treatment, and Distribution Planning

Abstract: Performing comprehensive water system planning that considers all elements of the water system from the supply source to the customer can provide utilities with a unified road map for providing high-quality water into the future. This presentation will look at the process used by the City of Corvallis to integrate all components of their water system into a single comprehensive plan that included a 50-year water supply strategy, built-in climate change considerations and seismic and flooding resilience planning. The focus will be on the benefits of conducting a comprehensive plan and establishing a consistent evaluation and prioritization approach across all facilities for capital improvement planning, financing, and implementation.

CEU Relevance Statement: This presentation will help utilities understand the benefits of combining long-term water system planning, including developing a consistent approach to evaluate and prioritize projects to that address operational concerns, address maintenance needs, target water quality concerns, and build in seismic resilience. Presentation will focus on evaluations and lessons learned from the planning effort conducted by the City of Corvallis that establishes a 20-year and 50-year road map for the water system. Operators can benefit from this discussion to understand key considerations and evaluation frameworks to translate to planning for improvements to their own water systems.

Author: Connor Mancosky **Author's Job Title:** Engineer

Email: cmancosky@carollo.com **Phone:** 7209399235

Organization: Carollo Engineers

Primary Job Duties: Project engineer and support staff on a range of water and wastewater planning and design projects throughout the Pacific Northwest. Recent focus on water system planning, water treatment facility plant planning and water treatment plant design.

Related Prior Employment: Graduate research assistant at the University of Wisconsin-Madison.

Registrations or Certifications: Licensed Professional Engineer in Washington

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Session ID: ResFPM02 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: You Cannot Conserve Your Way Out of Infrastructure Improvements

Abstract: HLID has been managing a 3,000 connections water system with only 75,000 gallons of storage. The need for storage has been understood since 2001, when a 1.6 MG of storage was recommended. When efforts to construct storage fell short, focus shifted to saving for future storage and adding supply. Efforts to manage demands have let the District to squeak by over the last two decades. Efforts include, conservation, odd-even watering, back-up power, VFDs for longer run times and less starts, complex SCADA programming predicting rate of fall in the tank, bringing wells online proactively to maintain pressure, time sensitive recipes to change lead pumps, rapid response alarms, and remote access to SCADA. Even with strict conservation efforts and new sources, the need for storage is catching up and proving to be the most cost-effective long-term solution. Along with the strategies that have sustained the District for nearly 20-years, this will highlight the District plans moving forward.

CEU Relevance Statement: This presentation will discuss alternatives and considerations evaluated for the systems with low volumes of storage. It will have components beneficial to planners, engineers, and system managers and operators. The tools presented will present options for owners to make informed and educated decisions during system planning.

Author: Michelle Johnson **Author's Job Title:** Project Manager

Email: mjohnson@jub.com **Phone:** 208-762-8787

Organization: J-U-B Engineers

Primary Job Duties: Michelle is a professional engineer licensed in the state of Idaho and Washington and is responsible for day-to-day project management, construction, and design for projects. She has been with JUB Engineers for 16 years, and she is currently working on several well and water system pipeline projects.

Related Prior Employment: Michelle Johnson has worked for JUB Engineers since 2005, and received her professional engineering license in Idaho in 2009 and Washington in 2019. Prior to working for JUB, Michelle worked in Missoula, Montana for a year after graduating from the Univer

Registrations or Certifications: State of Idaho, Professional Engineer, #13810; State of Washington, Professional Engineer, #56914

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Session ID: ResFPM03 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: An Experimental Technique for Protecting Wells Without Pump Systems

Abstract: Municipal wells often remain idle for months or years after they are constructed before a permanent pump can be installed. While the well is sitting unused, the stagnant water column can become the perfect breeding ground for native groundwater bacteria. Extensive bacteriological activity often results in lost well efficiency due to biofouling—a process that causes well screens and the adjacent aquifer to become clogged with biofilm. We will present an assessment of a low-cost experimental technique for mitigating bacteriological growth in wells without pump systems.

CEU Relevance Statement: This presentation seeks to address the common well maintenance problem of biofouling in idle wells while they wait for permanent pump installation. This presentation will be useful to both operators and water managers. Operators can use this information to support their efforts to protect idle wells from biofouling. Water managers and engineers will be presented with information to consider when planning to construct a new well or manage existing assets.

Author: Andrew Wentworth **Author's Job Title:** Staff Hydrogeologist

Email: awentworth@gsiws.com **Phone:** 5105930120

Organization: GSI Water Solutions, Inc.

Primary Job Duties: Andrew Wentworth is a staff hydrogeologist at GSI Water Solutions, Inc., and a Geologist in Training registered in the State of Oregon. He has three years of experience overseeing construction, rehabilitation, and operations of municipal wells, particularly ASR systems.

Related Prior Employment: Before starting at GSI, Andrew conducted research with the International Water Management Institute (IWMI) in Lao PDR studying pesticide pollution from commercial banana farms.

Registrations or Certifications: Geologist in Training

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Session ID: ResFPM04 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Keep the Water Flowing: Staying Ahead of the Water Demand Curve in a Multi-Source System

Abstract: The City of Walla Walla is a rapidly growing city that currently provides water service to just over 35,000 customers. As part of their water supply portfolio, the City of Walla Walla owns and maintains seven municipal water wells that supplement its primary Mill Creek surface water supply. The Well Master Plan project defines a supply strategy to increase the City's water supply resiliency by providing dependable operation for all wells. The supply resiliency strategy developed provides the City a redundant supply to its main supply source, from the Mill Creek watershed, in the event of a wildfire or inability to supply surface water to the water treatment plant. As part of the project, site visits were conducted at each of the well facilities to assess existing conditions of the pumping system, wellhead, facility security, and facility structure. A list of recommended improvements was developed for continued operation of the well facilities.

CEU Relevance Statement: As part of the project an Operations and Maintenance Plan was developed with input from the Water Treatment Plan Supervisor, Tom Krebs and Lead Operator Mike Neher, who provided invaluable guidance on existing operation procedures. The O&M plan will serve as a living document providing considerations for the City in its operations and maintenance strategy for meeting the City's long-term water supply goals defined in the Well Master Plan. The presentation will cover the following items relevant to the operation and maintenance of the City's water system; 1) Equipment maintenance activities and frequency; 2) water quality testing activities and frequency; 3) Specific capacity monitoring frequency; 4) Determining adequate staffing for the level of service.

Author: Joe Foote **Author's Job Title:** Senior Engineer

Email: Joe.Foote@Murraysmith.us **Phone:** 509-979-1557

Organization: Murraysmith

Primary Job Duties: Joe Foote is a Senior Engineer and Project Manager for municipal water projects at Murraysmith. Responsibilities include, water system master planning; design and construction management of water projects, including supply wells and treatment, pump stations, water tanks and pipelines.

Related Prior Employment:

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Registrations or Certifications: Professional Engineer (WA, ID, and MT); Project Management Professional

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Session ID: ResFPM05 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Both

Presentation Title: Seeing Purple: Final Design of the City of Beaverton's Non-potable Water System for Municipal Irrigation

Abstract: The City of Beaverton initiated the formation of a non-potable water utility to provide irrigation supply to the rapidly developing area referred to as South Cooper Mountain. The non-potable utility capitalizes on previous investments made by the City in its successful aquifer storage and recovery (ASR) program to provide a cost-effective supply of water for irrigation that would otherwise be derived from the City's limited drinking water supplies. Additionally, the non-potable system uses stormwater to augment the irrigation supply and enhance streamflows with innovative treatment and use of its ASR facilities. The presentation will cover major progress and achievements to-date including collaboration with developers, addressing technical issues for land use and overall system design and integration with the site, and operation and maintenance considerations. The facility is scheduled to be operational in 2023.

CEU Relevance Statement: This presentation will describe how the City approached developing the non-potable water system utility including internal coordination of City departments involved in the operation and maintenance of a non-potable water system and utility. The information shared will help operators understand the integration and interface between potable and non-potable water systems from an administrative and technical operations perspective.

Author: Ronan Igloria **Author's Job Title:** Principal Water Resources Consultant

Email: rigloria@gsiws.com **Phone:** 5039016897

Organization: GSI Water Solutions, Inc.

Primary Job Duties: Ronan is currently a Principal Water REsources Consultant for GSI Water Solutions, Inc. He manages a diverse range of water resources projects focused on water resources planning, watershed management, water conservation planning, source water protection, and water rights. Ronan is also involved in business development for GSI.

Related Prior Employment: Ronan has been in consulting for approximately 24 years having worked for a range of A/E firms in California and Oregon.

Registrations or Certifications: PE and CWRE in Oregon

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Session ID: ResFPM06 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Groundwater Source Development for Rockwood Water People's Utility District and the City of Gresham

Abstract: This presentation will describe the expansion of the Rockwood and Gresham groundwater supply system to fully supply the service area with water. Water rights, groundwater quality and availability, and source water protection were all evaluated during the decision-making process to develop this water source.

CEU Relevance Statement: This presentation will cover the assessment of source and finished water quality and the ability to protect the health of the community and meet all State and Federal Drinking water Standards through use of a high quality source and water treatment technology intended to meet current and future Lead and Copper regulations and anticipated future regulations for Manganese.

Author: Kari Duncan **Author's Job Title:** General Manager

Email: kduncan@rwpud.org **Phone:** 5037036903

Organization: Rockwood Water People's Utility District

Primary Job Duties: The General Manager serves as Chief Executive Officer of the District and is responsible for the administration and implementation of the District's policies and programs as adopted by the Board of Directors. The General Manager serves at the pleasure of the Board of Directors and is responsible to plan, lead and direct the operations of the District in order to ensure compliance with all applicable laws and statutes, District goals and policies, and regulations. The General Manager oversees day to day operations of the District to ensure the provision of high quality, cost effective drinking water service and is accountable for achieving the goals and objectives established by the Board in a manner consistent with Board-adopted policies, mission and values.

Related Prior Employment: Water Treatment Plant Manager for the Lake Oswego-Tigard Water Supply Partnership

Registrations or Certifications: Oregon Water Treatment Operator 4 and Water Distribution Operator Level 3

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Session ID: XconnFAM01 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Understanding the Costs When You Fail to Protect Drinking Water Resources

Abstract: This session would briefly describe the basic legal ramifications of failure to implement CCC programs as required by each state. The session would highlight the basic rule requirements which includes the basics of backflow protection for all public water system operators, managerial staff and applicable appointed/elected officials. It would introduce general discussion of why backflow protection is necessary and where to start. This session is geared to prime the audience for follow up sessions on the intricacies of backflow protection and the legal ramifications of not following through with system responsibilities.

CEU Relevance Statement: This would help all public water system operators, managers, public officials, administrators and engineers gain a basic understanding of backflow requirements, principals and the potential costs of failing to comply with the regulatory requirements that are in place for public health and safety.

Author: Terry Pickel **Author's Job Title:** Water Department Director

Email: TPickel@cdaid.org **Phone:** 208.769.2210

Organization: City of Coeur d'Alene Water Dept.

Primary Job Duties: Have worked for the CDA Water Dept. for last 16 years where I manage the day to day operations of the department. Currently have a staff of 24 full time employees.

Related Prior Employment: Was a former employee of City of Cheney for 24 years being Water Supervisor for 10 years. Past President of the Inland Empire Subsection, and President of the Idaho/Washington Aquifer Collaborative, (IWAC), Chair of the Idaho Water Education Foundation, B

Registrations or Certifications: WDM 3 – Washington, WDS – Washington, CCS – Washington, WTPO 2 - Washington, DWD 4 – Idaho, DWT 2 – Idaho

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Session ID: XconnFAM02 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Using Community-Based Social Marketing to Promote Cross-Connection Control Compliance

Abstract: One of the biggest challenges of implementing a cross connection control program is convincing customers to install backflow assemblies and then have them tested every year. Traditional education and outreach approaches and code enforcement can be expensive and time-consuming. This presentation will cover the basics of how a water utility can use Community Based Social Marketing strategies to improve compliance and educate customers.

CEU Relevance Statement: This presentation will provide strategies to increase compliance with cross connection control requirements with an emphasis on surveying for cross connection hazards, backflow assembly installation, and testing. Information will be provided to develop more effective and efficient cross connection education and outreach. A cross connection control education is Element 8 of the minimum requirements for a Cross Connection Control program under WAC 246-290-490.

Author: Jessica Shaw **Author's Job Title:** Deputy Public Works Director-Utilities

Email: jshaw@wenatcheewa.gov **Phone:** 5098883225

Organization: City of Wenatchee

Primary Job Duties: Jessica oversees the drinking water, wastewater, and stormwater utilities for the City of Wenatchee.

Related Prior Employment: Jessica has worked for the City of Wenatchee utilities since 2002. Prior to that, she was a chemist at an environmental laboratory.

Registrations or Certifications: She is currently a Washington State certified Group 4 Water Distribution Manger, Cross Connection Control Specialist, and a Group 3 Wastewater Treatment Plant Operator.

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Session ID: XconnFAM03 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Backflow Incident Response: Dana Street Irrigation Cross Connection

Abstract: Cross connection control programs and specialists work tirelessly to prevent backflow incidents. Yet occasionally backflow incidents still occur and we need to be prepared to respond. This presentation will look at the City's backflow incident response plan and what happened when we had to implement the plan as result of a backflow incident caused by an irrigation cross connection.

CEU Relevance Statement: One of the minimum elements of a cross-connection control program is to "develop and implement (when appropriate) procedures for responding to backflow incidents (WAC 246-209-490 (3)(h))." This presentation will provide an example of a backflow incident response plan and lessons learned from implementing the plan and the incident. The presentation will also help everyone who works in a water utility understand what their role could be in identifying and responding to backflow incidents.

Author: Jessica Shaw **Author's Job Title:** Deputy Public Works Director-Utilities

Email: jshaw@wenatcheewa.gov **Phone:** 5098883225

Organization: City of Wenatchee

Primary Job Duties: Jessica oversees the City of Wenatchee's drinking water, wastewater, and stormwater utilities.

Related Prior Employment: Jessica has worked at the City of Wenatchee since 2002 in the utilities. Prior to the City, she was a chemist for an environmental laboratory.

Registrations or Certifications: Jessica is a Washington State certified Group 4 Water Distribution Manger, Cross Connection Control Specialist, and Group 3 Wastewater Treatment Plant Operator.

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Session ID: XconnFAM04 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Increasing the Protection of the Water System and Finding Money, Political Support, and Understanding Where There May Not Be Any

Abstract: A brief look at a water system contamination and a look at the Cross Connection Control standards that were implemented in response to it. We will look at the regulations that were implemented and how political support was achieved to change the regulations. We will also look at the hardware and personnel that was needed and how the additional funding was gained.

CEU Relevance Statement: Water professionals know the importance of protecting the water quality but are often faced with funding and political hurdles. This will help provide the insight to overcome the hurdles to better protect the water quality. We will also look at the importance of backflow prevention and methods to continually increase backflow programs.

Author: Loren Searl **Author's Job Title:** Water Superintendent

Email: lsearl@spokanecity.org **Phone:** (509)625-7851

Organization: City of Spokane

Primary Job Duties: I have been the Water Superintendent for 5 years. Responsible for the daily operation and maintenance of the water system for the City of Spokane. Overseeing distribution construction and maintenance, metering programs, cross connection control and inspections. Developing budgets, standards, and policies for the water system.

Related Prior Employment: Over 25 years of experience in the water system for the City of Spokane. Have worked in distribution construction and maintenance, metering, and cross connection control my entire career with many years as a CCS and BAT. I am the current lead CCS for the

Registrations or Certifications: CCS, WDM

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Session ID: XconnFAM05 **Date:** 4/29/2022 **Length of Session:** 60 minutes

Area of Relevancy: Both

Presentation Title: Communication During a Backflow Incident - Customers, the Media and the Utility

Abstract: What you say during a backflow incident is just as important as what you do. There will be many entities seeking information and if you don't provide it someone will make it up for you. This presentation will discuss the who, what, when, why and how of communication during a backflow incident. We will look at what customers and the media want and need know and how to help them help you spread facts not rumors.

CEU Relevance Statement: Public health credibility is critical in assuring our customers trust us and the water that comes out of their tap. Being able to effectively communicate with customers and the media ensures that both will trust us not just during the good times but also when things go wrong. This presentation will give operators, managers and policy makers insight in how to maintain public trust during a backflow incident through effective communication. Real life backflow events will be used to help drive the message fo what works and what doesn't during an emergency.

Author: Scott Hallenberg **Author's Job Title:** Operations Manager

Email: shallenb@cityoftacoma.org **Phone:** 253-208-5345

Organization: Tacoma Water

Primary Job Duties: Operations Manager employed with Tacoma Water for the past 25 years. Responsible for regulatory compliance programs associated with our source and distribution systems, including source & coliform monitoring, LCR, DPB and Wellhead Protection. Also provide oversight of our flushing programs (unidirectional and dead-end), online analyzer QA/QC program as well as customer response regarding water quality concerns.

Related Prior Employment: 10 years as a nuclear operator, instructor and supervisor in the US Navy on the submarine USS Alabama and land based prototypes in Idaho and New York. First Line Maintenance Supervisor at Dresden Nuclear Power Station in Moline Illinois. Current owner of

Registrations or Certifications: WA - WDM, CCS, WDS

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Session ID: TreatFAM01 **Date:** 4/29/2022 **Length of Session:** 60 minutes

Area of Relevancy: Drinking Water

Presentation Title: Filtering the Options in Grants Pass

Abstract: With an aging water treatment plant, lacking seismic resiliency, as the sole source of drinking water, the City of Grants Pass determined construction of a new water treatment plant provides the best value for the future. Selection of a filtration technology (membranes or granular media) has been the first step in the design of the new water treatment plant. This selection needed to consider treatment capabilities, expandability, and staffing while choosing a process that fit within the established budget and footprint of the available property. This presentation will compare the treatment process capabilities and costs, discussing the factors that were key to the City in selecting a technology.

CEU Relevance Statement: This presentation will provide current comparison of treatment options available, and costs associated with these options. This presentation will also discuss how operational factors (including staffing time and training) are impacted by these decisions. The presentation will also include how these decisions are conveyed to elected officials and public.

Author: Ali Leeds **Author's Job Title:** Engineer

Email: aleeds@carollo.com **Phone:** 2066616324

Organization: Carollo Engineers

Primary Job Duties: I have been a water treatment plant planning and design engineer for more than 14 years. I oversee staff junior staff in analysis and design.

Related Prior Employment:

Registrations or Certifications: PE in OR and WA

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Session ID: TreatFAM02 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Restoring Filtration Performance at the Deer Creek WTP

Abstract: The Deer Creek WTP in Edmonds, WA has seen declining surface water filtration performance over the past two years. Filter run times and uniform filter run volumes had decreased to as short as 12 hours despite no changes to the incoming creek water quality. This presentation describes the investigation and fixes to restore filtration performance.

CEU Relevance Statement: Maximizing filtration performance without compromising water quality is critical to controlling treatment costs and rate impacts to customers. Filter maintenance and troubleshooting is a key aspect of an operator's duties to maximizing performance. This information can be used by other operators to improve their plant performance.

Author: Pierre Kwan **Author's Job Title:** Global Water Treatment Technical Director

Email: pierre.kwan@hdrinc.com **Phone:** 206-826-4735

Organization: HDR, Inc.

Primary Job Duties: Overseeing implementing drinking water treatment projects around the world.

Related Prior Employment: 21 years working at HDR Engineering, including stints as project engineer, project manager, and regional manager.

Registrations or Certifications: Professional engineer in Washington, Oregon, New Mexico, and British Columbia

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Session ID: TreatFAM03 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: City of Sultan Water Treatment Plant: Improvements to Expand Capacity and Enhance Plant and System Safety, Reliability and Resiliency For a 2-MGD Treatment System

Abstract: The City of Sultan is a rapidly growing city that currently provides water service to just over 5,000 customers. The City currently owns and operates a 1-MGD surface water treatment plant, constructed in 1978, that treats water from City-owned Lake 16 Dam. The Murraysmith design team is currently working with the City to design a plant with 2-MGD capacity with plans to expand to 2,000 gpm to utilize the City's water right. The goals of this project are: 1) expand treatment plant capacity; 2) provide enhanced operator control and plant safety features; 3) maximize the use of existing plant infrastructure; 4) enhance system sustainability and resiliency; and 5) improve plant security. The presentation will describe how the team approached the design to accomplish these goals, with an emphasis on decisions made to supply for future growth with greater reliability and resiliency. Design is expected to be complete in February 2022 with project construction planned for 2022-2023.

CEU Relevance Statement: The City of Sultan WTP produces treated water with outstanding quality. The lead operator, Mike Williams, has managed plant operation for 23 years and won a 2021 Washington State Department of Health Lifetime Achievement Award for Water Quality and Distribution. Mike, along with plant operators Matt Wood and Jason Strauss, provided invaluable guidance on recommended improvements for operator safety and water quality control. The presentation will cover the following design aspects for enhanced plant safety and operation: 1) consolidated storage of chemicals with added containment and appropriate separation 2) automated chemical feed redundancy and control 3) enhanced water quality monitoring with greater accessibility and reliability for operators. The discussion also includes how backwash design decisions enhance water supply reliability.

Author: Kristy Warren **Author's Job Title:** Senior Engineer

Email: Kristy.Warren@murraysmith.us **Phone:** 425-246-8662

Organization: Murraysmith

Primary Job Duties: Kristy is a senior process mechanical design engineer (Civil PE) with 17 years of consulting experience. She is a project manager and design lead for water and wastewater treatment designs, with experience designing plants and retrofits ranging from just a few thousand gallons per day to 500+ MGD. She has designed projects to treat water, wastewater, biosolids and biogas. At Murraysmith, she seeks to partner with clients in providing fiscally conservative and forward-thinking

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designs that reflect careful planning. Additionally, Kristy mentors and supervises EITs and early Professional Engineers to progress their skills with project work, and help plan their career paths.

Related Prior Employment:

Registrations or Certifications: Professional Engineer, WA

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Session ID: TreatFAM04 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Pilot Testing Membrane Filtration to Treat Surface Water for Aquifer Storage and Recovery (ASR)

Abstract: The City of Othello, Washington, provides potable water to residential and industrial users from groundwater wells located throughout the City. Industrial growth has caused a surge in water demand, raising concerns over the long-term health of the aquifer. Aquifer Storage and Recovery (ASR) was identified as a solution but, while local irrigation canals provide an adequate supply, water quality does not meet the standards required for ASR injection. To demonstrate the feasibility of using irrigation water as a source for injection, Murraysmith provided guidance and specifications for deployment, startup and operations of a mobile microfiltration trailer to treat 500 acre-feet of irrigation water. This presentation will discuss the feasibility of using a surface water source for ASR and the challenges associated with startup and operation of a large-scale (1 MGD) pilot membrane filtration system.

CEU Relevance Statement: This presentation will provide information and possible solutions for utilities interested in aquifer storage and recovery. The presentation will also provide relevant information for operations and maintenance staff regarding process optimization and operational challenges associated with a typical microfiltration system.

Author: Brian Rowbotham **Author's Job Title:** Civil Engineer

Email: brian.rowbotham@murraysmith.us **Phone:** 541-279-2465

Organization: Murraysmith

Primary Job Duties: Brian is a civil engineer with seven years of industry experience. He is a project manager and design lead for water and wastewater treatment solutions, with experience designing plants and retrofits for capacities ranging from just a few thousand gallons per day up to 150 MGD. He has spent the majority of his career designing water treatment systems for municipal and industrial clients with a focus on T&O removal, pretreatment systems, media and membrane filtration, and disinfection.

Related Prior Employment:

Registrations or Certifications: Professional Engineer Licensed in Colorado (Oregon pending application)

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Session ID: TreatFAM05 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Both

Presentation Title: Anacortes WTP Optimization with Advanced Analytics

Abstract: The City of Anacortes is applying a unique approach to optimization with BC's Opta approach that focus on a three-part framework: people+technology+adoption that achieves immediate and long-term impacts to improved utility performance. This City is applying real time analytical software (SEEQ) to evaluate and optimize operations of the high service pumping system, filters, and chemical feeds. This effort incorporates SCADA data to find potential performance increases and energy/cost savings for the City. This presentation will discuss how advanced analytics can enhance optimization at treatment facilities, cover the approach used to evaluate the City of Anacortes's treatment plant for optimization opportunities, and discuss how SEEQ was implemented for this study. The results of the evaluation and ongoing use of the analytics tools will be shared, including actual savings realized by the City and lessons learned from this optimization approach.

CEU Relevance Statement: Audience members will be presented with information about applying analytics to optimize water treatment plants with data analysis concepts. The case studies will inform the audience on how to approach optimizing operations of their facility and the power of advanced analytics techniques

Author: Isaac Brunk **Author's Job Title:** Water treatment plant super

Email: isaacb@cityofanacortes.org **Phone:** 3604281598

Organization: City of Anacortes

Primary Job Duties: Supervise water treatment plant operations of a 43 MGD plant

Related Prior Employment: Makah Tribe

Registrations or Certifications: WTPO 3, WDS 1

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Session ID: TrtResFPM01 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Pilot Operations: Foundations, Adaptation During On-Site Operations, and Lessons Learned

Abstract: In order to ensure successful operation of a 20-gpm dual train drinking water pilot, a series of procedures and protocols were developed in advance of on-site efforts. This presentation will provide an overview of the foundations put in place to support a team of operators, engineers, and scientists through the first 12-months of piloting efforts, including standard operating procedure (SOP) development, O&M procedures, safety protocols, as well as documentation and communication efforts. In addition to the foundation, the use and adaptation of these tools on-site and the lessons learned through operations will also be presented.

CEU Relevance Statement: This presentation will provide an overview of pilot operations, including instrument SOPs, safety protocols, day-to-day processes, and team communication developed. Along with how these practices and procedures were developed in advance of start-up, the lessons learned and adaption over the first year of operations will be discussed.

Author: Mia Vijanderan **Author's Job Title:** Environmental Staff

Email: Mvijanderan@brwncald.com **Phone:** (503) 977-6639

Organization: Brown and Caldwell

Primary Job Duties: Mia Vijanderan has supported drinking water and water resources projects with Brown and Caldwell since joining in January of 2018. These projects include corrosion control work, water quality analysis, bench- and pilot-scale testing, test plan development as well as design and permitting work.

Related Prior Employment: Prior to Brown and Caldwell, Mia worked with Oregon Department of Environmental Quality (DEQ), alongside Oregon Health Authority (OHA), to develop Oregon's state-wide monitoring and mandatory sampling of harmful algal blooms and cyanotoxins in drinking wa

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Session ID: TrtResFPM02 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Bull Run Water: Investigating Coagulation, Flocculation and Sedimentation at Pilot Scale

Abstract: This presentation will investigate the use of different coagulants, coagulant aids, flocculant aids, and other chemicals on treating the Bull Run water. Bull Run water is a unique water body with low turbidity, medium to low natural organic matter (NOM) concentration and low alkalinity causing very challenging conditions for coagulation, flocculation and sedimentation and requires an in-depth investigation. During this pilot study, variety of chemical doses and combinations were tested for each coagulant in order to achieve lowest settled water turbidity, particle count and NOM concentration. Ferric sulfate, alum, and polyaluminum chloride were compared side by side and across seasons. Tools such as a zetasizer, streaming current analyzer, and pH were compared to inform dose selection. Subsequently, the optimized conditions for each coagulant were tested side by side to find the best combination in terms of filter run time and filter effluent water quality.

CEU Relevance Statement: During this presentation, attendees will learn about variety of chemicals that could affect the coagulation. They will also gain knowledge on parameters that affect the coagulation and how to use them in order to improve the coagulation, flocculation and sedimentation. Instruments such as streaming current monitor and zeta sizer will be introduced and their benefit to the coagulation will be discussed. This topic is relevant to engineers who design coagulation systems, operators who look to improve water quality, and managers who decide which chemicals and tools will be available.

Author: mojtaba azadiaghdam **Author's Job Title:** Senior Engineering Associate

Email: mojtaba.azadiaghdam@portlandoregon.gov **Phone:** 15204402461

Organization: Portland Water Bureau

Primary Job Duties: I am a senior engineering associate at Portland Water Bureau. I am a lead in the pilot plant operations and conduct multiple investigation including coagulation that will be presented in this conference.

Related Prior Employment: As a PhD candidate, I have designed, built and operated a pilot plant that was aimed for treating secondary wastewater to drinking water. I have published over 25 research articles in high impact journals that has been cited over 350 times.

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Registrations or Certifications: I am a member of water quality and membrane processes committees in AWWA and I currently have an EIT certificate.

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Session ID: TrtResFPM03 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Bull Run Treatment Program (BRTP) - Headloss Characterization and Performance of Three Different Dual Media Filter Configurations

Abstract: Members of the BRTP "Pilot Team" had the opportunity to differentiate between three different dual media configurations in order to "filter out" which configuration had the most optimal performance for our specific raw water quality (0.3 - 0.7 NTU). When it comes to filtration, different media type, media size and media depth will produce different filter headloss performance. Using the headloss characterization along the filter column can be used as one of the tools to identify optimal media configuration and to identify scheduled maintenance needs to achieve performance goals. Since our source water has been unfiltered for so long, this is a unique opportunity for us to learn what works best for our specific water quality, and that's why comparing multiple filter configurations side by side is important to us. Information gathered will help the team make informed decisions leading to full operation of the Filtration Facility by 2027.

CEU Relevance Statement: Having a better understanding of the filter performance can prove to be beneficial for engineers designing a drinking water filtration facility and for operators who are operating the facility to optimize its performance. This improvement in understanding of filter performance can directly translate to more informed design, construction and operational decisions which could lead to costs savings for drinking water utilities. The information collected can inform scheduled maintenance, media size and depth selection.

Author: Humberto Piedra-Ruiz **Author's Job Title:** Engineering Associate

Email: humberto.piedra-ruiz@portlandoregon.gov **Phone:** 503-865-6590

Organization: Portland Water Bureau

Primary Job Duties: My name is Humberto Piedra-Ruiz, I've been an Engineering Associate with City of Portland Water Bureau (WB) for just over two years. My roles and responsibilities within the Bull Run Treatment Project team include pilot support, project safety coordination and general project support.

Related Prior Employment: I worked on FEMA funded capital improvement projects while at Portland Parks & Rec. prior to joining the Filtration team at the Water Bureau. Projects involved water conveyance structure rehabilitation and water damage mitigation.

Registrations or Certifications: I hold an Engineer-in-Training certificate (EIT).

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Session ID: TrtResFPM04 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: Pushing Rapid Gravity Filtration Rates into the 21st Century – Demonstrated Performance at 16 gpm/sf

Abstract: The City of Wilsonville is seeking to increase the capacity of the Willamette River Water Treatment Plant to 20 mgd by uprating its primary treatment processes. A 12-month filtration pilot study (July 2020 – May 2021) was completed to demonstrate successful high-rate filtration & obtain approval from the Oregon Health Authority to operate at a higher filtration rate. Pilot test runs showed excellent filter performance, which allowed the team to push the boundaries of conventional thinking & successfully test filtration rates upwards of 16 gpm/sf. During the study, filtered water turbidity averaged 0.03 NTU, and average UFRV was between 20,000 to 40,000 gal/sf before reaching terminal headloss or turbidity breakthrough. Full pilot study results will be presented & will highlight filter performance across different seasons.

CEU Relevance Statement: This presentation will provide an overview of how pilot filters can be used to help uprate a WTP's filter capacity and avoid costly infrastructure upgrades. It will also discuss the different challenge studies that can be performed using pilot filters that would not be feasible during a full-scale demonstration test when a WTP needs to be producing high quality water to customers. There are many nuances to operating a pilot, and tips and tricks from lessons learned will also be presented.

Author: Katerina Messologitis **Author's Job Title:** Process Engineer

Email: katerina.messologitis@stantec.com **Phone:** 2036877922

Organization: Stantec Consulting

Primary Job Duties: Katerina has about 5 years of experience in water/wastewater engineering. Her main responsibilities include water / wastewater treatment plant design and water quality / treatment studies at the pilot scale and at full-scale treatment plants.

Related Prior Employment: n/a

Registrations or Certifications: Oregon PE

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Session ID: TrtResFPM05 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Both

Presentation Title: Advancing Beyond Excel: Applying the R Software Environment for Water Quality Data Analysis

Abstract: Most water industry professionals are familiar with using Excel spreadsheets to analyze water quality data. However, many of the water quality datasets water systems routines work with strain the capabilities of spreadsheet packages like Excel. Such data sets are more easily analyzed in programable computing environments such as R or Python. This presentation will introduce the audience to data processing concepts that are better suited to computing challenges that water industry professionals are beginning to face more frequently, particularly those involving large data sets. Concepts will be introduced using R, an open source software environment focused on statistical computing and data visualization.

CEU Relevance Statement: This presentation will introduce key concepts related to data processing, analysis, and visualization in R, with a focus on the conceptual similarities and differences to Excel-based analysis. Focus will be placed on showing how R can simplify tasks regularly performed by water industry professionals. Case studies showing real-world examples of how R can reduce the time required for analysis of large data sets will be presented. These case studies will highlight how R is functionally different from Excel, and how R can be used to streamline tasks that are difficult to execute in Excel. Integration with advanced analytical tools such as SEEQ will be discussed.

Author: Karina Woodland **Author's Job Title:** Senior Staff Environmental Engineer

Email: kwoodland@brwncald.com **Phone:** 2067492885

Organization: Brown and Caldwell

Primary Job Duties: Provide support on design projects related to water and wastewater infrastructure. Experience has ranged from construction services, process mechanical design, and process design. Has had a focus on several projects related to data analysis and optimization specifically for water treatment applications.

Related Prior Employment: This is Karina's first job post-education. Previously she was employed as a graduate research student for her master's research at Michigan Technological University.

Registrations or Certifications: EIT in the State of Idaho

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Session ID: TrtResFPM06 **Date:** 4/29/2022 **Length of Session:** 30 minutes

Area of Relevancy: Drinking Water

Presentation Title: What to Do With All This Data? Automated Analysis and Reporting of Data from Two WTP Pilot Tests

Abstract: Data management has becoming increasingly challenging as more and more information is available to us. This presentation looks at how data was managed and processed in real-time for two pilot studies at conventional WTPs in the NW and the Midwest. The data analysis process was automated to take data from pilot system SCADA, full scale SCADA, pilot grab samples, utility WQ lab, and commercial lab data into a common database and data dashboard. All performance data analysis was automated so that summaries of ozone and ozone AOP data, filter performance, and lead and copper pipe loops were continuously uploaded to monitor testing performance in real time.

CEU Relevance Statement: This presentation, though focused on pilot systems, shows how real time data can be analyzed and used for performance monitoring and optimization of full-scale water treatment plants. Operators will see how they can use the copious amounts of data available in their water treatment plants in a simple dashboard to compare the performance of their systems in a way that isn't realistic to accomplish with SCADA systems. The presentation of the data will also include results and conclusions from pilot testing.

Author: Enoch Nicholson **Author's Job Title:** Senior Drinking Water Engineer

Email: Enoch.Nicholson@jacobs.com **Phone:** 425233325

Organization: Jacobs

Primary Job Duties: Responsible for providing senior oversite to all types of drinking water infrastructure projects from planning, testing, design, and construction.

Related Prior Employment: I have been at Jacobs for 16 years since college.

Registrations or Certifications: Professional Engineer in Oregon, Idaho, and Washington

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State of Oregon

Dear Jill Hoyenga,
Thank you for attending the 2022 PNWS-AWWA Annual Conference April 27 – 29, 2022. Your commitment to the water works industry was evidenced by your attendance at this extended webinar. We recommend you keep this letter for your files.

Below is the electronic record that was gathered by recording your answers to quizzes at the beginning of each technical session and after each hour of presentations. While every effort was made for accurate accounting of the attendance, if you should find an error, please contact Kyle Kihs, Executive Director of the PNWS, at kkihs@pnws-awwa.org.

For your information, the maximum Continuing Education Units (CEUs) that you could have obtained for the entire extended webinar was 0.6, for six hour of content. For those who track Professional Development Hours (PDHs), 0.1 CEU = 1 hour of instruction.

Operators who are also certified by the Washington Department of Ecology for wastewater treatment, please take note that Washington Certification Services awards CEUs for webinars in three-hour increments only. Therefore, you must have attended the entire three-hour morning session or afternoon session to earn CEUs.

Thank you again for attending the 2022 PNWS-AWWA Annual Conference

Your Credits for the State of Oregon: 0.X CEU's in Water

Date / Time	Session	Reference	CEU's
		XXXX	**0.1**