MWEA Fall Technical Conference

Abstracts & Bios

Stoney Creek Lodge - Columbia, MO
Thursday, November 5, 2026
8:00am - 4:45pm

8:00 AM - 9:00 AM

Room: 1

Session: Beyond Traditional NDT: Delivering Deep Insights into Marshfield's 20-Inch 2 Mile Ductile Iron Forcemain

Speakers:

- **Eric Luschen, MMG -** Eric Luschen is a Regional Sales Representative with McIntire Management Group (MMG), a manufacturers' representative serving the water and wastewater industry throughout Missouri and Southern Illinois. He works closely with municipalities, utilities, engineers, and contractors to provide innovative, long-term infrastructure solutions for water distribution and wastewater collection systems. With experience in trenchless rehabilitation, pressure pipeline renewal, valve technologies, and collection system maintenance, Eric focuses on helping owners address aging infrastructure through practical, cost-effective solutions. He is passionate about sharing emerging technologies and real-world applications that improve system reliability, reduce lifecycle costs, and extend the service life of critical assets.

Abstract: The City of Marshfield, Wisconsin has actively been maintaining the quality of the local environment for 140 years. It is located in central Wisconsin and since 1880 the city has provided wastewater collection and treatment services to 21,400 residents in the city and surrounding areas. There are over 138 miles of sanitary sewer lines in the city which convey the wastewater to the treatment plant. Wastewater that cannot flow by gravity to the wastewater treatment plant must be pumped from four separate lift station locations on the east, north, and west sides of the city through forcemains. One major concern in the proper operation of the collection system is exfiltration. Exfiltration is especially damaging from forcemains because they pump wastewater under pressure and can cause an extensive amount of polluting discharge into surrounding waterways.

In November 2023 it was noticed that the wastewater treatment plant was receiving approximately 1 mgd less flow than normal. This discrepancy was identified by comparing the Northeast Pump Station flow to the plant daily influent. The pump station delivers wastewater through a 20 inch ductile iron pipe forcemain that runs 2 miles in length. The spill occurred under a street and into a culvert. The location was obvious when the upstream side of the culvert was compared to the downstream side. The creek on the downstream side was full of water while the upstream side was relatively dry. When the pipe was excavated the cause of the exfiltration leak was clear. There was a 4 inch hole in the forcemain. The city decided to

inspect the entire length of the forcemain to assess the integrity of the line and plan future actions to prevent sewer spills.

CPM Pipelines was selected to use an internally deployed ultrasonic inspection tool to assess the pipe condition. The tool is able to provide several findings including measured wall thickness, pipeline deviation from the provided trajectory, angular displacements at joints, joint gap widths, delamination, sulfate attack, cement lining deterioration and other anomalies.

Damage to the cement liner was observed along nearly the entire pipeline length. In addition, numerous locations exhibiting delamination and external wall damage were detected. Angular displacements greater than 4 degrees for PVC pipe and 5 degrees for DI pipe are deemed to be extreme. A total number of nine joints exceed the thresholds of the materials. Gap widths in excess of 1.4 inches is deemed to be excessive. A total of two joints with extreme gaps were identified within the DI pipeline.

One of the most important condition assessment parameters that the inspection device analyzed is wall thickness. Following the inspection, it was determined that the average remaining wall thickness for the majority of the ductile Iron pipe segments (iron + cement lining) falls within the range of 0.52 to 0.60 inches. The PVC pipe segments at the end of the trajectory have an average wall thickness of 1.18 inches. A significant number of pipe segments in the second half of the pipeline contained localized regions where a considerable amount of the wall had deteriorated. The cement liner was intact but the DI pouter layer was severely impacted in 30 pipe segments. In all of these cases this is caused by significant corrosion on the outside of the pipe. A total of 4,361 instances of delamination were identified where the cement liner is separating from the DI pipe.

Leakages are detected using a hydrophone. The results show that there was no noticeable increase in the sound signal in this pipeline. This indicates that no leakages have been detected. Sulfate attack (H2SO4) can occur in the concrete and asbestos cement pipe segments of wastewater pipes and can cause the pipe to deteriorate into a critical condition. At only one location along the inspected pipeline, H_2SO4 attack was observed.

Due to several causes, such as corrosion of the material layer, sulfate attack or erosion of the cement, deterioration in cement liners can occur. Along nearly the entire pipeline alignment, a suspected defect in the cement liner was observed at the invert (6 o’clock position).

This presentation will include information from the utility operators on how the issue was identified, how it was located and how it was repaired. The methods for minimizing pollution impacts from the leak will also be discussed. The city will also discuss the process for retaining a certified contractor to perform the inspection work. The contractor will present on the deployment of the NDT device and collection, analysis and reporting of the data to the owner. The city will then discuss the conclusions obtained from the analysis and how the data informed its rehabilitation plans for the future.

This presentation will provide a roadmap for other utilities when the inevitable forcemain leak occurs; from identification to repair to inspection to planning future asset management solutions.

8:00 AM - 8:30 AM

Room: 2

Session: Fine, I'll Do It Myself - MDNR's Sewer Extension Authority Supervised Program

Speakers:

- **Eric Seaman, McClure Engineering Company -** Eric Seaman PE is a Senior Project Manager with McClure Engineering. He has worked in the water field for over 30 years as a utility director and consulting engineer.

Abstract: Sewer providers with a POTW of 1 MGD capacity or greater can apply to MDNR for a supervised program to provide sewer extension approvals that do not require an additional sewer extension permit from the Department. This presentation will describe the requirements to obtain the program approval and the benefits and drawbacks of a provider getting a supervised program.

8:30 AM - 9:00 AM

Room: 2

Session: In-Line Storage for CSO Mitigation

Speakers:

- **Michael Hall, Black & Veatch -** Mike is a Senior Engineering Manger with over 31 years of experience in wastewater collection, treatment, pumping and I&I reduction, CSO mitigation, along with potable water supply, treatment, storage, pumping and distribution. His experience includes extensive knowledge in municipal and industrial (high strength waste and highly purified water) facilities related to permitting, site investigations, construction administration and management, as well as operations. His experience in construction engineering includes design-build, construction manager at risk (CMAR), value engineering, cost estimating, traditional project delivery, and direct contract negotiations.

Abstract: This presentation is to detail how Kansas City, Missouri is leveraging in-line storage within the existing sewer collection system as a cost-effective strategy for reducing Combined Sewer Overflows (CSOs).

On September 27, 2010, a federal judge signed the original Consent Decree requiring Kansas City to reduce the volume and frequency of wet weather sewer overflows into local creeks, streams, and rivers. It was originally planned as a 25-year, $4.7 billion program.

The project is now under its Third Amended Consent Decree. This eliminated the requirement for construction of some very expensive projects through 2035, such as underground storage tunnels, which lowers the program cost to $2.3 billion through 2035 versus the previous total of $4.7 billion. Part of the reduction in the project costs and elimination of the underground

storage tunnels is the implementation of the use of In-Line storage within the existing collection system.

9:00 AM - 9:10 AM | BREAK

9:10 AM - 9:40 AM

Room: 1

Session: Basics of Pump Station Rehabilitation

Speakers:

- **Rebecca Howley, GBA, Inc. -** Rebecca Howley has almost 30 years of experience, all with GBA, developing solutions to meet client goals in evaluating and designing storm and sanitary sewer systems for small and large organizations. Her technical responsibilities include hydraulic modeling of gravity and pressure systems, designing sewers and lift stations, analyzing data, and recommending cost-effective methods to improve collection system and treatment performance. Her approach to project management is to form a collaborative team of experts to perform efficiently and closely track performance, budget and schedule. She lives in University City with her husband and a houseful of children.

Abstract: Pump stations are essential to reliable wastewater infrastructure. Unlike traditional gravity systems, pump stations introduce mechanical and electrical components into what might otherwise be a simple hydraulic process. As owners look to spend every revenue dollar efficiently, pump station rehabilitation presents opportunities for less costly infrastructure renewals, but come with unique challenges.

The presentation will provide an overview of evaluation and condition assessment, including tools and procedures. Based on the evaluation, design considerations will include life cycle and costs, design flows, future growth, and operator collaboration. In addition, rehabilitation might not always be the best solution for a given situation.

9:40 AM - 10:10 AM

Room: 1

Session: Introduction to Aerobic Granular Sludge

Speakers:

- **Brett Quimby, Aqua-Aerobic Systems -** Brett has been in the water/wastewater industry for over 10 years with skills in design, application and technical support for biological treatment processes with a focus on AquaNereda® Aerobic Granular Sludge technology.

Abstract: Aerobic Granular Sludge (AGS) technology is an advanced biological wastewater treatment process that utilizes a dense granular biomass to reduce organic matter, nutrients, and solids. Operating as a batching technology with optimized cycle structures, sludge develops into large, dense microbial aggregates displaying as particles greater than 200 microns in diameter that perform biological nutrient removal and display exemplary settleability relative to conventional activated sludge. The layered microbial community enables simultaneous nitrification/denitrification and enhanced biological phosphorus removal to occur within the granular biomass.

The AGS process has been implemented successfully for over 20 years with over 140 plants either in operation or under construction globally. Introduced to the North American market in 2017, there are now 32 plants operating or under construction in North America. These installations represent both municipal and industrial applications operating in a range of climate conditions. One of the main reasons for selecting the AGS technology at many of these sites was the compact footprint, allowing for significant savings in construction costs. Another strong driver included nutrient capabilities for current or future objectives as well as process resiliency to handle industrial contributors, wet weather conditions and salinity intrusion, and toxic shock events. Ultimately, the AGS technology resulted in the lowest life-cycle cost and provided these various other benefits for the end-user.

This presentation provides an overview of AGS technology with example of how it has been implemented at various site across North America.

9:10 AM - 10:10 AM

Room: 2

Session: How to Keep Your Bugs Happy

Speakers:

- **Sandy Bernard, Lochmueller Group –** Sandy Bernard is the lead Process Engineer at Lochmueller Group. She has been with Lochmueller for over 4 years. She spent the first 11 years of her career working as the process engineer at a wastewater treatment plant. This is where she developed a passion for operations troubleshooting. At Lochmueller Group, Sandy enjoys working on wastewater and drinking water treatment process designs in addition to an occasional operations troubleshooting project. Sandy is a licensed professional engineer in Illinois, Missouri, and Indiana. She earned her bachelor's degree in civil engineering and a master's degree in business administration at Southern Illinois University Edwardsville.

Abstract: Operators at WWTPs are charged with maintaining treatment processes and ensuring everything runs smoothly. Especially as facilities add in more biological treatment processes for

nutrient removal, more of this work centers around keeping the bugs in the treatment processes happy. This presentation will provide a discussion on the types of bugs typically encountered and their ideal environments. It will also discuss what can be controlled and what can't within a typical plant, along with some methods for providing the best environment possible, even when there are things the operator can't control.

10:10 AM - 10:20 AM | BREAK

10:20 AM - 11:20 AM

Room: 1

Session: Planning to Deliver

Speakers:

- **David Ecklund, Burns and McDonnell –** David is a project engineer with experience in both water and wastewater design and planning, including water distribution system modeling, collection system modeling, master planning and studies, and capital improvement project identification. He currently works with a variety of both public and private clients across the Midwest, ranging in size from 3,000 residents to over 200,000. His experience in leading technical aspect for hydraulic modeling and planning projects has allowed for success with a variety of challenging projects and unique applications to provide quality results and holistic system analysis. For collection systems, he also has experience in Private Inflow Reduction project identification and application, sanitary sewer design, flow monitoring program identification and implementation, and condition assessments.

Abstract: Water and wastewater utilities across the United States are navigating a rapidly evolving landscape shaped by aging infrastructure, regulatory pressures, economic development demands, and shifting population dynamics. Traditional planning approaches often fall short when they are disconnected from the realities of project delivery. To meet today's challenges, utilities need a planning framework that is intentionally aligned with implementation from the outset.

Burns & McDonnell has developed a nationally proven model that integrates planning, design, and construction to support utilities from initial vision through final delivery. As an integrated design and construction firm, our teams bring deep experience across all phases of infrastructure development, enabling us to serve as a true partner to the utilities we support. This approach makes planning a strategic foundation for delivering capital improvements that are cost effective, constructible, and aligned with long-term community needs.

This presentation will explore how a "planning to deliver" model enhances utility outcomes by grounding decisions in real world delivery considerations. By incorporating construction insight early in the planning process, utilities benefit from more accurate budgets, realistic capital improvement programs, and proactive regulatory compliance strategies. The approach also

emphasizes stakeholder engagement to support transparent, defensible rate structures that reflect both community expectations and the utility's long-term financial health.

Across diverse communities — rural, suburban, and urban — utilities are increasingly facing constraints such as inflow and infiltration, capacity limitations, aging assets, and compliance risks. These challenges can quickly become barriers to economic development and service reliability. Through a progressive, adaptable, and proactive planning framework, utilities can identify system needs, prioritize investments, pursue funding opportunities, and accelerate the delivery of critical infrastructure.

The session will highlight how our approach has enabled utilities across the State to move from planning to implementation of major capital programs within compressed timelines. Attendees will gain insight into practical strategies for aligning planning with delivery, structuring capital programs for success, and building partnerships that support long-term utility resilience.

By reframing planning as the first step in delivery, utilities can transform vision into action — leading to infrastructure investments meet today's demands while positioning communities for sustainable growth well into the future.

10:20 AM - 11:20 AM

Room: 2

Session: Navigating the Lagoon Ammonia Variance Pathway: What Missouri Facilities Need to Know

Speakers:

- **Scott Adams, Missouri Department of Natural Resources -** Scott Adams is a P.E. with over 20 years at the Missouri Department of Natural Resources. He's spent the last five years in the Engineering Section of the MoDNR-Water Pollution Control Program, where he supports infrastructure planning, design review, and technical assistance for wastewater facilities across the state. He also serves as the Ammonia Variance Technical Advisor, providing specialized guidance to communities interested in pursuing an ammonia variance to meet regulatory requirements while maintaining practical and sustainable operations. Scott's work focuses on helping Missouri utilities navigate complex engineering and water quality challenges with clarity, efficiency, and long-term resilience.

Abstract: Would meeting lower ammonia limits have a significant impact to your community? Missouri's Ammonia Water Quality Standards Variance offers a flexible and practical pathway for wastewater facilities that face challenges meeting updated ammonia criteria designed to protect sensitive aquatic life while giving communities time to make affordable progress in ammonia treatment. This presentation will explain the purpose of the variance, who qualifies, how to apply, and the options available to help facilities reach their highest attainable condition through targeted planning and incremental improvement. Attendees will also learn when a

variance may not be necessary and how the department can support facilities throughout the process. Questions are welcome.

11:20 AM - 11:50 AM

Room: 1

Session: Duckett Creek WWTP-4: Planning for the Future. Building in Reality.

Speakers:

- **Nate Murphy, CMT -** Nate Murphy has a bachelor's degree in civil engineering from Southern Illinois University Edwardsville. Nate works as a Civil Engineer for Crawford, Murphy & Tilly inc., in their Water Resources Department. His work experience consists of roles in design and construction services for water and wastewater projects. Nate holds a position on the executive board of the Engineers Without Borders – USA, Gateway Professional Chapter, as Past President, and is the co-lead and primary project contact for the project in Khasu, Bolivia.

Abstract: Wastewater Treatment Facility No. 4 is located on a 19-acre site in St. Charles County, Missouri, between Dardenne Creek and planned residential development. The facility was designed as a phased, expandable treatment plant to serve future growth in the area. Phase 1 provides 2.5 MGD average capacity and 6.7 MGD peak capacity, with future expansion planned for 5.0 MGD and ultimately 7.5 MGD average capacity. Several site conditions affected the design and construction of the project. Protected wetlands, stormwater separation requirements from Dardenne Creek, and regulatory setbacks reduced the usable area to approximately half of the site. In addition, poor soil conditions required geotechnical investigation and foundation improvements, including concrete piers and thick mud slabs, to support major structures such as the pump station and oxidation ditch. The presentation will explain how these site limitations and soil conditions influenced the facility layout, construction sequencing, and future expansion planning.

11:20 AM - 11:50 AM

Room: 2

Session: Navigating the PFAS Puzzle: Strategic Assessment and Prioritization for Stormwater Management

Speakers:

- **Andrea Collier, Barr Engineering Co. -** Andrea is a licensed professional Environmental Engineer and Vice President at Barr Engineering Co. with more than 23 years of experience in water resource management, stormwater and wastewater infrastructure and permitting; process control; and waste management. Her background

in PFAS related projects includes permitting, environmental audits, sample collection and data review, and stormwater infrastructure and treatment. Andrea is also certified as a drinking water operator in MO.

Abstract: Many industrial facilities are currently assessing or considering the assessment of PFAS presence at sites worldwide. Initiating the evaluation process and determining the next steps can present unique challenges, particularly in stormwater. In this case study, I will outline an approach to evaluating PFAS contaminants in stormwater at industrial facilities, from initial document review and data gathering to designing and implementing best management practices. This evaluation approach includes a method for prioritization to help make informed decisions about resource allocation. Addressing stormwater contaminants is often an iterative process, and I will discuss some management practices and regulatory drivers that might be considered as the evaluation of PFAS progresses towards implementing solutions.

11:50 AM - 1:10 PM | LUNCH

1:10 PM - 2:10 PM

Room: 1

Session: A Solid Solution for Culvert and Large Diameter Pipe Rehabilitation

Speakers:

- **Eric Luschen, McIntire Management Group (MMG) -** Eric Luschen is a Regional Territory Representative with MMG, a Kansas City-based manufacturers' representative firm serving the water and wastewater industry throughout Missouri and Central/Southern Illinois. Eric works closely with municipalities, utilities, consulting engineers, and contractors to identify practical, long-term solutions to challenges involving wastewater, stormwater, potable water, and pipeline infrastructure. His experience includes rehabilitation technologies, corrosion-resistant infrastructure, air and control valves, sewer rehabilitation, trenchless pressure-pipe solutions, and other innovative water and wastewater products. Eric's approach focuses on bringing practical technologies and lessons learned from the field to engineers and utility professionals to help address common infrastructure challenges, extend asset life, and reduce long-term maintenance and operational costs. Eric is passionate about sharing innovative technologies and real-world applications that can provide municipalities and utilities with better long-term solutions to aging infrastructure.

Abstract: This presentation explores culvert and large-diameter pipe rehabilitation, with a detailed look at the materials used for CCCP, the equipment and site requirements for project completion, engineering and specification considerations, project challenges and case studies of completed CCCP projects.

1:10 PM - 2:10 PM

Room: 2

Session: Advanced Composite Solutions for Structural Pipe Strengthening Problems In Wastewater Treatment Plants

Speakers:

- **Joel Ogle, Henkel/Fyfe Fiber -** Joel has over 30 years of sales, marketing and applications experience, the last 25+ years focused on the municipal water, wastewater, and stormwater markets with an emphasis on asset management. Joel is a NACE/AMPP Level 2 Coatings Inspector as well as a NASSCO PACP/LACP/MACP certified inspector. Prior to, during and after military service, Joel's educational studies focused on Applied Science and Business Management.

Abstract: This presentation will detail how CFRP, Carbon Fiber Reinforced Polymers were used to design a Class IV structural rehabilitation solution of the steel piping within a wastewater treatment plant. How CFRP is used to build a pipe within a pipe to minimize plant disruption that usually occurs with pipe replacement. The presentation will detail how the rehabilitation design is determined using industry standards and guidelines as well as material properties and QA/QC processes that are followed. The presentation will detail how CFRP can be used to extend the life of the WWTP piping for 50+ years.

2:10 PM - 3:10 PM

Room: 1

Session: Checking All the Boxes with a Mobile Platform Solution

Speakers:

- **Tony Strawhun, MSD -** Tony Strawhun, P.E. is a Civil Engineer Senior on the MSD St. Louis Operations Asset Management team. In his previous role as a Business Analyst Specialist on the MSD IT Business Technology team, he was heavily involved in setup, configuration, and administration of the DataSplice application, including the capital project asset information tool; and in his previous role as Plant Engineer on the MSD Operations Asset Management team, he worked closely with Nora and MSD Engineering team to update capital project specifications to include requirements for asset information gathering. During his decade of experience in the chemical and petrochemical manufacturing industry, and almost a decade with MSD St. Louis, he has been heavily involved in process information gathering, equipment specification, mechanical integrity assessment programs, and the application of technology tools to enhance the maintenance management processes.
- **Nora Tochtrop, MSD -** Nora Tochtrop, P.E. is the Operations Division Manager at the MSD St. Louis Missouri River Treatment Plant and Coldwater Creek Treatment Plant. In

her prior role as Principal Engineer for the MSD Operations Asset Management Division, she focused on asset strategies aimed at risk-based decision making for operational and long-term capital planning. She has played a critical role in the update and modernization of the process to gather asset information during capital projects. During her nearly two decades of experience in process engineering and consulting followed by her nearly two decades of experience with MSD St. Louis, she has worked on a spectrum of projects in the petroleum additive manufacturing, steel manufacturing, environmental remediation, and wastewater treatment industries.

Abstract: This presentation will cover St. Louis MSD's development of a mobile solution to better populate asset information within their enterprise asset management system. The discussion will focus on improved capital project construction management as the first business use case for this asset-related mobile solution. The talking points will include the selected technology used, the earlier attempts preceding recent success, and the benefits being recognized.

2:10 PM - 3:10 PM

Room: 2

Session: DeSoto's WWTF Expansion From the Owner's and Owner's Rep Perspective

Speakers:

- **Gary Beck, GBA -** Gary has provided professional engineering services for communities in Kansas, Missouri, Nebraska, Iowa and Texas. He is a firm Principal and Client Manager for GBA. He has worked for 40 years with GBA on wastewater, water, storm and environmental projects. He graduated with a Bachelor of Science and Master's civil engineering degree from the University of Missouri Rolla (S&T) and the University of Missouri.
- **Brian Hess, GBA -** Brian has worked in the public sector for over 27 years with over 20 of those for municipalities. He has held roles as City Engineer and Utilities Director in Missouri and as General Manager for a Water/Wastewater utility in Alabama. He currently serves as the Water Group Lead for GBA and is a licensed engineer in the states of Missouri and Kansas. He holds a Bachelor of Science degree in Civil Engineering from the University of Missouri.

Abstract: Often under the radar are "The Other Guys", city personnel and their representatives that have the vision and implementation skills to set up and provide critical leadership and engineering for alternative delivery projects to meet their goals.

This is a story of how the City of De Soto, Kansas, a small city on the outskirts of the KC metro, maneuvered through many decisions to build treatment capacity to accommodate a new Panasonic Batteries Plant. We will discuss the planning and decisions that helped the city determine the best path forward and resulted in a successful progressive-design-build project and the expansion of the City's WWTF from 1.3 MGD to 2.6 MGD. The project not only

provided plant capacity for the Panasonic facility but also laid the groundwork for other future industries. This was truly an example of teamwork.

3:10 PM - 3:20 PM | BREAK

3:20 PM - 3:50 PM

Room: 1

Session: A Rural City Moving Forward: Saving Silex's wastewater Utility

Speakers:

- **Rebecca Howley, GBA -** Rebecca Howley has almost 30 years of experience, all with GBA, developing solutions to meet client goals in evaluating and designing storm and sanitary sewer systems for small and large organizations. Her technical responsibilities include hydraulic modeling of gravity and pressure systems, designing sewers and lift stations, analyzing data, and recommending cost-effective methods to improve collection system and treatment performance. Her approach to project management is to form a collaborative team of experts to perform efficiently and closely track performance, budget and schedule. She lives in University City with her husband and a houseful of children.

Abstract: The Village of Silex, population 225, has struggled to effectively collect and treat their wastewater. The city was awarded a $5 million ARPA grant in 2022 which is a once-in-a-lifetime opportunity for the city to respond to these challenges and provide a foundation for quality of life in the city going forward.

The city's wastewater treatment system consists of a primary and secondary lagoon which was converted from a discharging facility to a sub-surface drip dispersal system about ten years ago. The non-discharging facility has not performed as expected, due to excessive infiltration and inflow (I/I) in the system and insufficient leach field capacity. In addition, the city operates seven lift stations. The design team began with a condition and capacity assessment of the collection and treatment systems. The construction project includes rehabilitation of all seven lift stations, expansion of the leach fields, I/I repairs, and lagoon improvements as well as adjacent site improvements. Management challenges included working with a city with limited staff, pivoting design goals when construction bids came in lower than expected, and coordinating with the City’s drinking water design consultant.

3:20 PM - 3:50 PM

Room: 2

Session: Design and Construction of the Caulks A pump station Upgrade

Speakers:

- **Chad Ross, TWM -** Chad Ross is a Project Manager at TWM, having been at the company for 26 years. Chad is responsible for the design of wastewater treatment facilities, lift stations/pump stations, sanitary sewer collection systems and water distribution systems. He is involved in all phases of projects including design, permitting and construction management. Chad has also been involved in using the latest computer software to model water systems, sanitary sewer systems and storm water systems. This has allowed TWM to develop improvement plans and master planning for future expansion for TWM's clients. He is a licensed Professional Engineer in Missouri and Illinois.

Abstract: Caulks Creek A Pump Station, located in the City of Chesterfield, MO, serves the Caulks Creek Watershed and the Chesterfield Valley. Originally constructed in 1981, the station needed major repairs and additional capacity to address a known wet weather sanitary sewer overflow. The existing pump station consisted of a dry pit / wet well configuration that discharged to a common force main with six additional interconnected pump stations. Odor control and corrosion protection were included in the upgrades to address the microbial-induced corrosion at the station. Several options for upgrading the pump station were considered. This presentation will look at the planning stage, design, and construction, as well as the challenges encountered.

As part of the planning stage several configurations were considered, including constructing a second pump station at the site to handle dry weather flows, and converting the existing pump station from a dry pit to a submersible pump installation. Converting to submersible installation was the chosen configuration, which simplified the station operation and could be constructed within the existing lift station site. The installation in the converted well included two submersible low flow pumps and three submersible high flow pumps, all on variable frequency drives (VFD).

Several aspects of the design presented challenges. The capacity of the pump station needed to be increased from 10 to 19 MGD and the pumps discharged to a 30 to 36-inch force main with six additional interconnect pump stations. Along with the additional pump stations the configuration of the force main created a complex set of hydraulic conditions. This required hydraulic modeling of the system to determine the multiple pump scenarios. A pentaplex pump configuration was designed to address these different conditions. Two parallel smaller pumps and two parallel larger pumps with VFD's, plus one on standby, were selected to meet these various requirements.

The existing concrete was highly corroded due to the high H2S at the station. Polymer concrete and epoxy coatings were used to protect the structure. A scrubber was installed to address the vapor phase corrosion and calcium nitrate was used to address the liquid phase corrosion. Construction of the pump station was completed in the fall of 2023. A lesson learned was that a complete retrofit of the pump station can be a viable cost-effective option.