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February 2022

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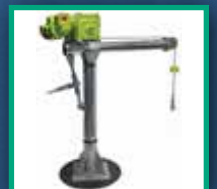
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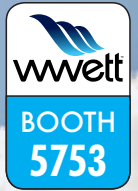
Old school meshes
with new technology
to help a small town
meet compliance needs

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Matthew Duke
Town Administrator
Muldrow, Oklahoma

PRODUCT FOCUS:
PIPELINE AND INFRASTRUCTURE, HYDRANTS





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STUCK IN THE I&I RUT

The number one problem for wastewater collection systems is infiltration and inflow (I&I) and its associated costs.

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ITS CAUSES AND ITS COSTS

Over time, manhole grade adjustment rings made from concrete degrade due to freeze and thaw cycles, increased traffic, impact loading and chemical attack, leading to the infiltration of soil and water through the ring interfaces and manhole chimneys. All these forces exert pressure on the manhole to push the concrete riser rings and other components apart, eventually resulting in settlement, cracking of the roadway surface or structural failure of the manhole.

According to 13 years of studies researched by the City of Bryan, Ohio, the largest amount of I&I – up to 60% – enters the sanitary sewer system through cracked manhole chimneys. During a rain event, seepage through a single broken chimney can be as much as 50 gallons of water per minute.

The cost to cities is multi-faceted:

1. Cost to repair or replace damaged manholes and manhole chimneys
2. Cost to repair roadway cracking
3. Cost to repair damage to water system caused by excessive flow caused by I&I
4. Environmental and public health cost and regulatory fines of sanitary sewer overflows (SSOs) that occur when untreated sewage discharges into the environment due to exceeded capacity caused by I&I

“Jim Fruechtel has told us all along, with the Ladtech rings there is no I&I, no rehab, no deterioration in the pockets and the rings endure freeze thaw. The rings actually do what they say they will do.”

Tim, the current supervisor in charge of the road construction projects in Apple Valley, MN

A LONG-TERM SOLUTION

If inflow & infiltration are ongoing problems and existing manhole fixes don't last, a change in approach is necessary. Specifiers of the Ladtech System® have praised its easy installation, effectiveness at preventing I&I and zero repair work. Learn more by reading about projects in Revere, Massachusetts and Apple Valley, Minnesota.

CITY OF APPLE VALLEY, MN

Tim, the current supervisor in charge of the road construction projects in Apple Valley, MN just reiterated what Mr. Jim Fruechtel a retired Apple Valley City Engineer, has confirmed back in 2011 and even in the last few years when he inspected the existing manholes that were installed in 1998. He states “The beauty of the Ladtech rings is that they indeed prevent I&I and also eliminate reconstruction, which has benefited the city of Apple Valley. Jim Fruechtel was so impressed back in 1998 he connected Dave Hanson, area supervisor for Bonestroo Rosene Anderlik & Associates a consulting and engineering firm in Minnesota. Dave Hanson field tested the Ladtech System® in two different locations in 1998.

This is what Dave Hanson had to say, “We were concerned about how the rings would hold up during the spring thaw. Because of the success of this evaluation we have specified LADTECH rings in twelve additional residential street projects. “The LADTECH rings last longer and they don't cost any-more and are much quicker and easier to install.” Dave said he was always concerned about the quality control of concrete rings. “We were not able to obtain consistency with installation of concrete rings. Construction companies would use different mortar mixes, sometimes causing deterioration of the concrete. With the LADTECH rings, we eliminate this variable.”



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ON THE COVER: Muldrow (Oklahoma) Town Administrator Matthew Duke and his wastewater crew are all cross trained and licensed for multiple jobs so they can pitch in and help wherever needed. (Photography by David McNeese)



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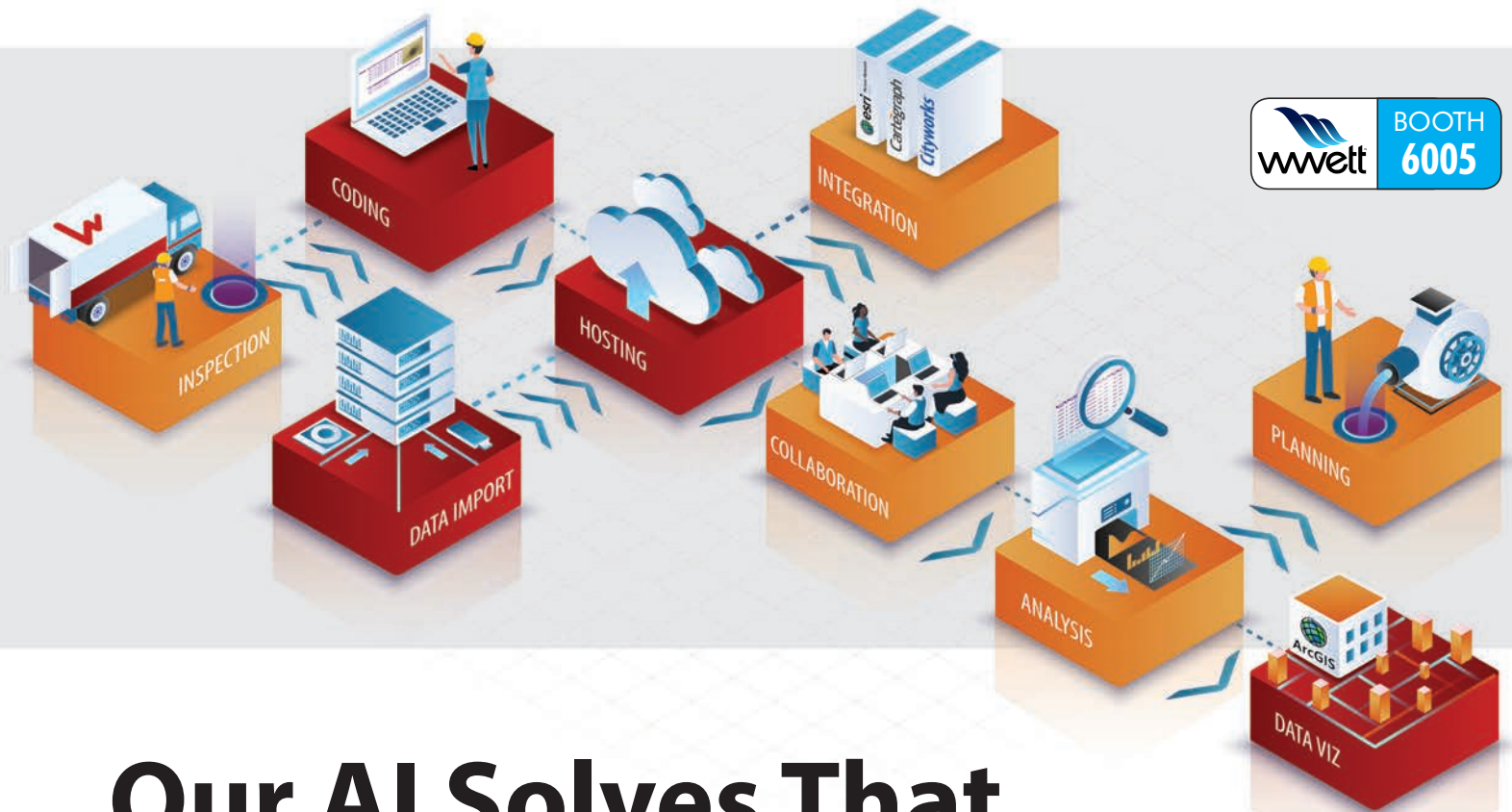
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SYSTEM MAINTENANCE PROFESSIONALS

Published monthly by:

COLEpublishing

1720 Maple Lake Dam Rd., PO Box 220,
Three Lakes WI 54562



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CONTROLLED CIRCULATION: 30,000 copies per month (U.S. and international distribution).



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Luke Laggis

OPPORTUNITY IN WASTE

Poor understanding of water usage begs for outreach efforts

With the advent of smartphones and watches and a variety of health and fitness apps, it's gotten common for people to know how many steps they've taken in a day, how many calories they've burned and a variety of other metrics. Yet very few of those people have a good handle on their daily water consumption. Most have no idea.

Research backs that up. Americans underestimate the amount of water they use daily by 90%, according to new research conducted by global research agency Opinium on behalf of American Water. With a majority of Americans underestimating their own personal water usage, the study also found a lack of awareness for water consumption in specific areas of their lives. Most believe

they use less than 100 gallons of water each day, but according to Water Footprint Network, the real number is more like 2,000 gallons when taking indirect use into account.

Letting the water run while brushing teeth tops the list of the most common wasteful activities, with one in five Americans doing this every day. Assuming people are brushing their teeth twice a day for a minute each time, this would waste 3 gallons of water each day or 1.5 gallons each minute. With nearly 20% of the U.S. adults doing this daily, that means around 149.9 million gallons of water are lost every day to this easily changeable routine.

On the bright side, almost 90% of Americans are open to incorporating at least one new water-conserving habit this year.

The Opinium survey found that Americans — regardless of gender, homeownership or age — are largely unaware of their water footprint and the variety of ways in which water impacts their everyday lives. Most don't realize how much water is required to produce foods, clothing and other products.

That poses challenges for you both directly and indirectly. Extra water means additional rate revenue, but you're also taking on the extra expense of wastewater treatment along with greater use of the resource. On the bright side, almost 90% of Americans are open to incorporating at least one new water-conserving habit this year, and while you won't likely make an impact on their indirect use, you have the potential to make a meaningful impact on direct water use.

How much water could your utility save if you invested some effort in outreach to get more of your customers to turn off the water while brushing their teeth? Or only running the dishwasher and washing machine when they're full? Or shorter showers? Less lawn watering?

There are plenty of ways to approach the issue. None will solve the problem, but each bit helps. The mere fact that the average American has so little understanding of how much water they use shows that most people are unknowingly and stubbornly using more than their share. It's a simple lack of awareness in many cases, and that presents opportunity. It's opportunity to educate, to build better relationships with your customers through outreach efforts and to make a difference in your communities.

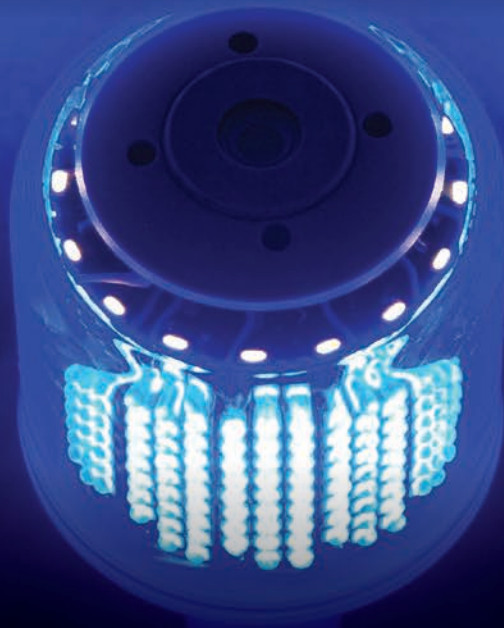
Here's hoping you can make something positive out of the problem. Enjoy this month's issue. ♦

Comments on this column or about any article in this publication may be directed to editor Luke Laggis, 800-257-7222; editor@mswmag.com.

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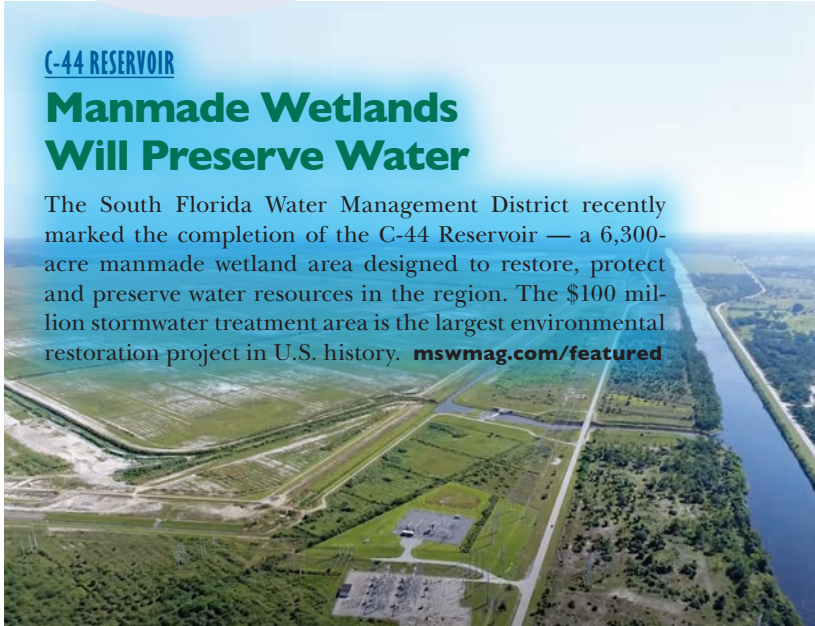
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C-44 RESERVOIR

Manmade Wetlands Will Preserve Water

The South Florida Water Management District recently marked the completion of the C-44 Reservoir — a 6,300-acre manmade wetland area designed to restore, protect and preserve water resources in the region. The \$100 million stormwater treatment area is the largest environmental restoration project in U.S. history. mswmag.com/featured



OVERHEARD ONLINE

“Without federal funding, poor and marginalized households will continue to fall behind on their bills and experience the indignity and health risks of having their water turned off.”

— *Millions of Americans Struggle to Pay Water Bills — Here's How a National Aid Program Could Work*
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VIDEO TOUR

Milwaukee Metropolitan Sewerage District

As part of the My Wisconsin Backyard series, Milwaukee PBS recently posted a video touring the Milwaukee Metropolitan Sewerage District. Lake Michigan, along with the city's rivers, are hotspots for local recreation, and the video was created in an effort to show the public how these waterways are kept clean. You can watch it in this online exclusive article. mswmag.com/featured



GPS TROUBLESHOOTING

Ensure Your Project Stays on Track

Construction companies and utilities often use GPS for positioning, measuring and machine control. When GPS performs optimally, workers can rely on the data for making decisions about the construction project. When GPS isn't working well, it can stop a project in its tracks. mswmag.com/featured



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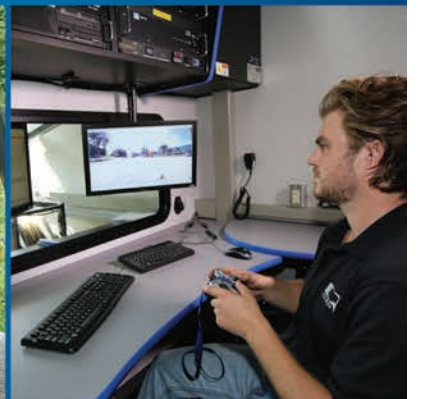
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A PERFECT BLEND

Old school meshes with new technology to help a small town meet compliance needs

By Suzan Chin-Taylor



Town of Muldrow (Oklahoma) wastewater operator Josh Randolph adjusts the Digester Skimmer at the wastewater treatment facility in Muldrow. (Photography by David McNeese)



PROFILE:
Town of
Muldrow, Oklahoma

POPULATION:
3,200

COLLECTIONS SYSTEM:
19 miles of gravity sewer,
5 lift stations

EMPLOYEES:
42

**TREATMENT PLANT
CAPACITY:**
0.650 mgd

WEBSITE:
www.townofmuldrow.com

Right: Muldrow wastewater crew members (from left) Leslie Taylor, Jene Grinstead, Matthew Duke, Larry Dyer, Josh Randolph and James Hyatt.

The small town of Muldrow, Oklahoma, population 3,200, is efficiently managed by a lean crew. Over the years, they have taken an old-school approach to managing their sewer collections system, treatment plant and water systems, but new technology is helping them stay ahead of the community's needs.

The town of Muldrow's utilities formed to serve the region's water needs and in 1935 its first tax was imposed on residents to enable the addition of water services for the community. A decade later the construction of the current sewer collections system was completed. It comprises 12.5 miles of mainlines, five lift stations and 388 manholes. Pipelines are primarily vitrified clay pipe with diameters ranging from 6 to 14 inches. The topography of the area is hilly, so the system is primarily gravity-based.

"Based on the region and the construction practices available at the time, the system we have is pretty impressive and the lines were extremely well laid, and considering their age are in fairly good health," says town administrator Matthew Duke.

The town's original sewer system was installed in 1946, replacing a lagoon system. Upgrades were performed in the 1980s to create a mechanical treatment facility with digesters, sand beds for drying sludge and one clarifier. In 1993 an additional clarifier was added, followed by an aeration basin. In 2010, another round of upgrades added a second aeration basin and digester along with sludge dewatering so that the biosolids could be hauled off to a local landfill. This \$6 million improvement gave the plant a capacity of 0.65 mgd and it processes on average 0.42 mgd daily.

Finding the financial wherewithal to perform upgrades or add equipment can be a challenge for such a small community, but Duke and his team are resourceful and take advantage of grants available through the state OMAG program to procure needed tools and items to keep their systems healthy.

Over the years one of the biggest challenges Muldrow faced was rags and wipes constantly coming through the lines and creating backups at the plant. This forced the



“The trick is not to ignore it and to keep going out there and looking at your collections system.”

Matthew Duke

operations team to add more maintenance calls for line jetting, cleaning and clearing pump stations. It also required the plant's pumps and aerators to run at higher speeds, which raised energy costs. The addition of a bar screen from Enviro-Care at the headworks helped tremendously and since its installation, the problematic debris is being caught before it can enter the treatment facility.

All in-house

Surprisingly, the small Muldrow crew is able to perform all its collections system preventive maintenance and inspection entirely in-house. The fleet includes a PipeHunter jetter unit that is skid-mounted onto the back of a 2-ton pickup and a small CCTV inspection system from Gen-Eye. There is a tremendous amount of departmental cross-training for the sewer plant operator, water plant operator, utility worker, special projects manager, utility director and the city administrator. All are certified or trained to perform each other's jobs.

"We do not have a dedicated inspection crew or pipeline cleaning crew. Whoever is available for the day and not assigned to another project is usually the one performing the tasks," Duke explains. "All of us carry multiple licenses so we have the ability to help each other out whenever one of us is having a specific issue in our department."

Despite the availability of data collection software, Muldrow is still effectively performing field inspections, manually taking notes on pipeline assessment and adding findings into Excel spreadsheets. They have found that by utilizing SL-RAT

acoustic technology from InfoSense as a first point of assessment, they can be more efficient with their limited crew. If the SL-RAT indicates a blockage or some other issue, they will deploy their sewer camera into the line. To date they have inspected the entire collections system utilizing this approach.

"Incorporating the SL-RAT for assessing our whole collections system, which is fairly spread out, was an enlightening moment for everybody within our staff. It enabled us to get out in the field, pop manholes, investigate them quickly and see all of the problems that we had throughout the collections system," Duke says. "It showed us that in some areas the system was not in as decent shape as the town imagined."

"Although finding situations like this can be overwhelming for a utility director, the nice thing is that it allows you to get a game plan set so that you can start chipping away at your issues and get back to where your system is in a healthy condition again," he says. "The trick is not to ignore it and to keep going out there and looking at your collections system. Although it is one of the toughest things to do for small community, you need to go and look for the problems whether you think you have those problems or not."

Muldrow experienced a little windfall recently regarding the assessment of its collections system through the work of the local gas utility, which was installing a new delivery system through a significant portion of the community. This required that Muldrow's existing infrastructure in the new

“I would’ve never believed that such a small amount could produce as much as it does and have such an impact.”

Matthew Duke

construction area be inspected to map locations of buried utilities and pinpoint any existing cross bores, as well as prevent new cross bores from happening. The gas utility jetted and inspected 70% of Muldrow’s collections system and generously shared a copy of the footage with the city.

Luckier than most

Muldrow is fortunate in that it has been able to cost-effectively use traditional dig-and-replace methods for aging and failing pipes, but the use of trenchless methods isn’t off the table.

“We do have some areas that are older that we suspect will have the potential for us to go a trenchless route, as they go under creeks and are located in difficult access areas. So when the need arises, we will certainly be looking at incorporating these remote methods if it makes sense,” Duke says.

New approach

Muldrow’s retention ponds at the treatment plant were holding approximately 7 feet of sludge, which was becoming problematic during rain events as the ponds were over 60% of total capacity. While proactively looking for a solution, Duke was introduced to a new disruptive technology from EnBiorganic Technologies and was offered a free, no-risk performance trial of a new proprietary patent-pending system that could start reducing sludge content in the retention ponds in a noticeably short period of time.

Muldrow agreed to try it and the EnBiorganic Technologies EBS-Di unit was installed in one of Muldrow’s lift stations approximately 2 1/2 miles upstream from the treatment plant. The EBS-Di autonomously delivers a controlled, monitored consortium of customized active soil bacteria into the system that is hungry and ready to enjoy the “food” available in a particular system’s wastewater stream.

Upstream from the lift station is a food processing plant that makes breaded and marinated prepackaged chicken products. Rather than the typical byproducts associated with food processing, Muldrow was experiencing an onslaught of breasting material that would enter the system when the factory performs its washdowns every shift. An oatmeal-like material would come into the system and create an unusual reaction in the wastewater stream, creating a glue-like sludge that would clog up the lift station. A special screen was installed to work in tandem with the EBS-Di system to counteract the effects of the oncoming breasting material, acting like a septic tank so just clear liquids could flow through into the lift station and then be treated.

“You can definitely see the significance and difference of using active customized biology and the benefits of the dosing unit,” Duke says. “The amount of time the bugs have to culture and how rapidly they dominate the system means that you’re getting a whole lot more result from them.”

“Using this unit that is nearly 2 1/2 miles upstream from the sewer plant, we are able

Muldrow has had great success with EnBiorganic Technologies’ EBS-Di bug injection system, which delivers a controlled, monitored consortium of customized active soil bacteria into the system.



The Enviro-Care bar screen machine at the wastewater treatment facility in Muldrow.

LISTEN AND BE OPEN

As a small community, it is vital to recruit, train and retain star talent for your utility operations.

One of the Town of Muldrow, Oklahoma’s biggest keys to success has been its ability to train staff to understand every facet of their system. This also includes encouragement to pursue and investigate issues on their own whenever they have an opportunity. Staff members are encouraged to make a point of investigating anything they’ve never seen before or that looks out of place, such as a leaf or twig in the water at the water plant or to try to follow I&I until they find the source.

“Retention of a skilled and talented employee is critical to the health and stability of an organization — after investing in training, to lose someone to another industry is a huge deal because this loss puts you back at a costly point of starting again from scratch. It’s important to recognize how much information a staff member absorbs at their position and the value of that knowledge,” explains Matthew Duke, town administrator for Muldrow.

Coming from a commercial construction background, and often being the most knowledgeable member of the team, Duke has learned that although he may have this repository of know-how, is important to recognize the intellectual property that is held by the team in the trenches.

“It’s important to listen to your employees. You don’t necessarily have to take everything as gospel, but whenever they’re concerned, you need to be concerned, as they are the ones who see what’s actually happening within the system on a daily basis.”



to produce tremendous amounts of bugs that are able to regenerate and replicate so quickly. I would've never believed that such a small unit could produce as much as it does and have such an impact."

Prior to the performance trial, the Muldrow team hadn't utilized additional bioaugmentation but had attempted to fight the good fight culturing its own bacteria that occurred naturally within the system, and by adding oxygen as they could. The same food processing plant that was creating some of the maintenance issues was using bioaugmentation at their pretreatment plant, which helped but wasn't enough to combat the substantial amounts of sludge that were building up in the retention ponds and aeration basins.

One of the biggest surprises was the effect of this upstream bioaugmentation technology on the lift station. Within five days of operation, this station that had a history of having quite a bit of FOG had none. "It's the cleanest that the station has ever looked, and we're finding that we're also having quite a few less blockages in our mainlines downstream in that 2 1/2 miles from the lift station to the plant than we've ever had before," Duke says.

One of the common benefits from the technology is that by changing the wastewater makeup, less aeration is required at the treatment plant, saving energy and expense. It is hoped that over time experimenting with lower aeration levels will deliver significant savings.

The work on the reduction of the sludge in the retention ponds is now underway and showing great promise. Just like the bar screen, finding technologies that can help with maintenance, labor and wear

"It's the cleanest that the station has ever looked."

Matthew Duke

and tear are always exciting for a small town like Muldrow, especially when given the opportunity to evaluate an innovative technology on a trial basis.

Incorporating the new technology was a big step for Muldrow.

"This was a wonderful opportunity to see what the technology could do for us because it was a leap of faith; but at the end, if it can make your systems run better and be more cost-effective, it really benefits anybody out there to give new things like this a try and experience the potential ROI for themselves." ♦

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OPTIMIZING FLOW

Data from South Bend's sensor network prevents combined sewer overflows

By Steve Lund

Numbers don't lie. Seeing trends in data has helped Richard Radcliff, combined sewer overflow operations manager for the South Bend (Indiana) Wastewater Department, spot issues before they become problems.

The numbers generated by a network of sensors (CSONet, hosted by Xylem Vue) on the collections system, along with data visualization tools developed by South Bend and EmNet have helped South Bend all but eliminate dry-weather overflows of the combined sewer system, and wet-weather overflows substantially reduced.

"Our overflows per inch of rain keep going down and down," Radcliff says. Part of that reduction is from a sewer separation project, and other efforts to prevent I&L, but Radcliff thinks much of it comes from his team's use of data collected by the sensors to manage the system better.

Multiple sensors

Originally installed in 2007 and upgraded in 2017, the 150 sensors in the system measure flow, depth, velocity, positions of weirs and gate con-

RC	Description	Depth (ft)	Critical SP (ft)	Flow (GPM) or Pump Run Time	Velocity (ft/s) or Pump Run Time	H2S (ppm)	Last Upst	Node (ID)	Sensor	IR	IRP
001	RC1 Secondary Line (CSO 048)	0.35	3.11				3 min	G.15.2	1		
	RC1 Upstream - Primary	1.02	3.00				3 min	G.3a.1a/c	2		
	Interceptor by Boat Launch E	2.15	3.00				3 min	L.15.1.2	1		
	Interceptor by Boat Launch W	2.25	3.00				3 min	L.15.1.2	2		
002	RC2 Upstream	0.55	5.40				4 min	G.30.1	1		
	Interceptor by Farmers Market	2.05	4.00				4 min	L.30.2	1		
003	RC3 Upstream (Moore LS)	3.60	6.00	P1 RT: 90 P2 RT: 52			56 min	L.13.3	1		
	RC3 Downstream - Int. St Louis	3.07	4.00				5 min	L.13.1	1		
	CSO 014	0.30	0.70	Valve	100		5 min	G.8.1	1		
004	RC4 Upstream	1.40	3.50				5 min	L.8.1	1		
	RC4 Downstream - Int by CSO 025	15.55	7.00				5 min	L.8.1	1		
005	RC5 Parrshall Flume Upstream			4.06			4 min	L.SA.SR.32	1		
	RC5 Upstream Laser	1.45	0.00 (SJ)	3399	1.47	1.22	4 min	L.SA.SR.32	1		
	RC5 Downstream	2.21	0.00	5252.3	1.46		56 min	L.SA.SR.31	1		
006	RC6 Upstream						38 min	L.SA.SR.30	1	50	
	RC6 Downstream	0.31	0.00	260.75	2.75						
	Kauffman Park Liffstation						2 P1 RT: 1				
007	RC7 Upstream										
	RC7 Downstream - CSO 045	657.8	663.0	17103	(Calc)	2.37					
008	RC8 Upstream - Colfax Liffstation						6.00	P1 RT: 10 P2 RT: 10			
	RC8 Downstream - AM General										

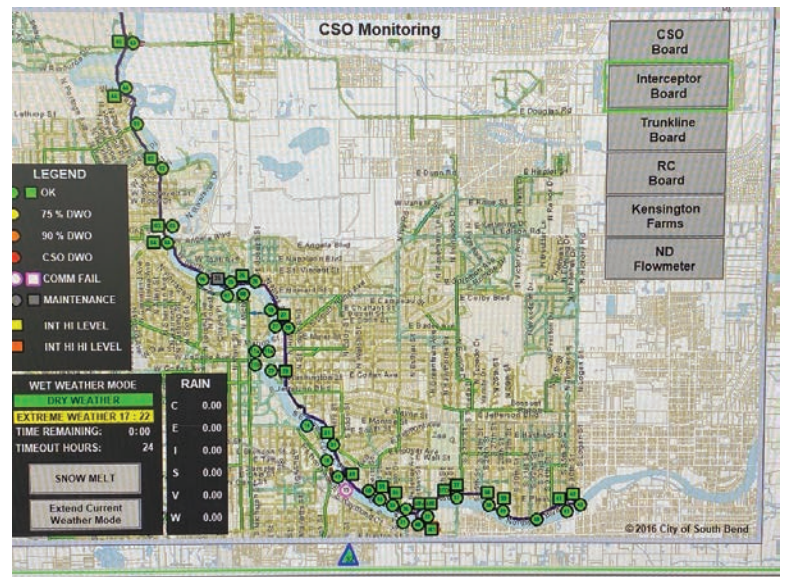
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APPLICATION:
Spotting issues before becoming problems

BENEFITS:
Eliminates dry-weather overflows of the combined sewer system, and reduces wet-weather overflows

USER:
South Bend, Indiana



trol valves, water temperature, river level, turbidity and oxidation reduction potential. The system has automated valves to direct the flow in the sewers and control stormwater basin levels.

"We've learned quite a bit from having the sensor data," Radcliff says. "For example, we discovered our interceptor pipe was not being completely filled before we would have wet-weather discharges. Using the sensor data, we identified places in the system where we could run parallel throttle lines and pinch valves.

"It's a 'smart' sewer system. As rain comes in, the pinch valves open up and allow more flow to go into the interceptor, until all that capacity gets filled. Then they start closing down. We've been able to optimize flow into the interceptor and help minimize wet-weather discharges."

Data for planning

Radcliff hopes the sensor data will help improve the design and reduce the cost of the next phase of South Bend's long-term control plan. The first

phase was the creation of the sensor system, along with separation of the storm and sanitary sewers in some neighborhoods. The first phase reduced combined sewer overflows by 75%, according to the city's website.

The next phase will involve building storage areas in the collections system. The original estimated cost was \$700 million, more than four times the cost of the first phase, but data collection over the years has led to some modifications. The new Phase 2 is called the Smarter Alternative for a Greener Environment and has a much lower price tag at \$200 million. The city is waiting for federal approval of the new plan.

"We recognized that we could do this a lot better," Radcliff says. "It's like the old expression, 'You don't know what you don't know.' We got smarter over the life of the sensors that we put in. That's what allowed us to revise our long-term control plan and, we hope, save the city a considerable amount of money while concurrently making the environment better."

Revised storage

Radcliff says the revised plan still calls for underground storage, but not as much as in the initial plan. "We're still going to need tanks; the system still does overflow, but the sizes and the locations have changed," Radcliff says.



"The success we've had will allow us to build smaller and fewer tanks than we thought we would need."

Richard Radcliff



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“The success we’ve had will allow us to build smaller and fewer tanks than we thought we would need. Sensors brought light to the collection system and allowed us to find blockages, find I&I and find problems. Sensors gave us a better focus on where the problems are.”

Working with the numbers and visualizations that the sensor network produces, Radcliff can see problems developing that sometimes don’t show up in a physical inspection. In one incident he called to alert a crew on the road to a problem at a site. They said they had just checked it, and it was OK. Radcliff didn’t think so and arranged to meet them at the site.

“This place is 25 feet deep,” he says. “We set up confined-space equipment and sent a man down there. When we brought him back up, he had a quarter-piece of manhole cover that had lodged in there. It wasn’t enough to stop the flow, but over time, stuff could have built up on that piece of manhole cover and caused a blockage, and possibly an illegal overflow.”



“We’ve been able to optimize flow into the interceptor and help minimize wet-weather discharges.”

Richard Radcliff

Discovering “monsters”

His colleagues wondered how he knew what was in there; he said he didn’t know what it was, only that something wasn’t right. “I’m in an office 2 miles away, and this is 25 feet underground,” Radcliff says. “I saw the level rise a tenth of a foot, and I knew that wasn’t normal. This is the kind of thing you miss with your eyes, but the numbers don’t lie.”

A quarter of a manhole cover is tiny compared to some of the things Radcliff and his crew have found in the collections system. At one point he saw a bump in the trend line for a section where the water level went from 2 to 3 feet to 4 feet, then back to around 3 feet. They found a large amount of grit in the section where the water level bumped up. After a CCTV inspection, they found a root mass that was slowing down the flow and causing the grit to be deposited.

They also found large chunks of concrete and rocks that formed a dam inside the 96-inch interceptor sewer. The only way to remove that was to send a diver in to tie ropes around the obstructions so they could be hauled out. “To me, looking at numbers, I know what normal looks like,” Radcliff says. “It could be a manhole cover, a root mass, whatever. It’s apparent to me from a distance.”

Radcliff has given a PowerPoint presentation called “Discovering Sewer Monsters” at an Indiana Water Environment Association conference and other events. One obstruction found in the sewers he named “The Blob,” because it resembled the monster from an old sci-fi film. Another he called “Jaws” because it reminded him of a shark.

Targeting maintenance

The sensor data also helps South Bend prioritize maintenance near the 35 overflow points in the system. “It may not be necessary to go to every site every single day,” Radcliff says. “If any sites appear to be above normal ranges, we can go to those sites. It allows me to optimize flow in the system and optimize maintenance and operations.”

Over time, sensors have shown that some areas are problem-free, so the sensors could be moved to places where they might be more useful. “As a result of looking at the data, it’s clear that some sites we don’t need to worry about,” Radcliff says. “We’ve moved sensors around, we’ve deleted some in some areas, and we’ve added some to others. It’s a living, ongoing system.”

Before the monitoring system was installed, South Bend was averaging 35 dry-weather overflows a year, each one resulting in a hefty fine from the EPA. Now the system almost never has dry-weather overflows.

“If someone asked me to manage a system that didn’t have sensors, I’d say it’s all but impossible. I don’t know how you could manage a collections system without a sensor network. You’d just be blind. You’d never be able to quantify the effect of the changes you make.” ♦

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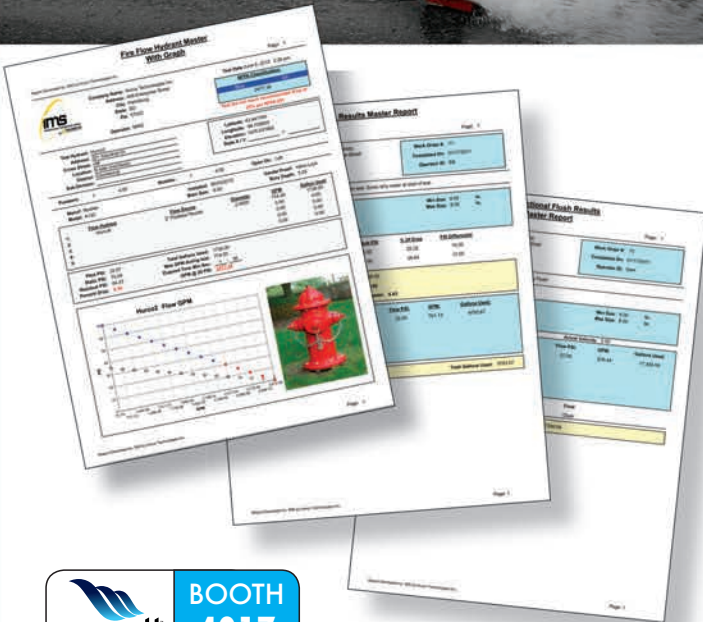
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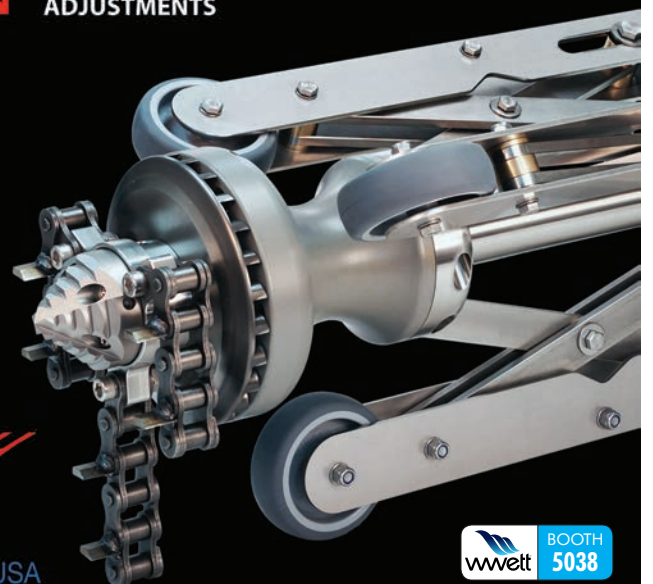
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TAKING WATER MORE SERIOUSLY

Texas utility's multipronged approach to water conservation brings significant benefits

By Steve Lund

In the drought-prone region between Dallas and Austin, the water utility in Round Rock takes water conservation seriously.

The utility encourages conservation by promoting reuse water, having a tiered rate structure, educating residents on smart irrigation, promoting water-saving appliances with rebates, helping customers find leaks, and actively detecting leaks in the water infrastructure.

“Our gallons per capita per day were high. People just needed to take water more seriously.”

Michael Thane

The results have been impressive. Peak water use has dropped, even though the city's population has grown 20%. Total gallons per capita per day dropped 29%, from 206 in 2009 to 146 in 2019.

Decades of reuse

The city has offered reuse water for irrigation since 1998, when a golf course started using it. The program has grown continually since then. It saw a major expansion in 2012, and recently a new hotel tapped the supply for cooling tower makeup water. The city has pumped as much as 2 mgd of reuse water in the summer.

The utility began making other conservation efforts a priority in 2009. One of the first moves was to adopt a tiered rate structure. “We just had one rate, and it was very low,” says Michael Thane, director of the Utilities and Environmental Services Department.

Jessica Woods, Round Rock water conservation coordinator, visits customers to advise them on how to set their irrigation systems for better water efficiency. (Photos contributed by the Round Rock Utilities and Environmental Services Department)



“We talk to the customers, and they can ask all the questions they want.”

Jessica Woods

“Our gallons per capita per day were high. People just needed to take water more seriously. We would talk about water conservation, but if your rate structure doesn’t mirror what you are trying to promote via outreach and education, people don’t listen.”

Round Rock typically pumps 15 to 18 mgd in winter and 32 to 35 mgd in summer. Its all-time high was 42 mgd in during the drought of 2011. The highest day in 2020 was 36 mgd. “It’s weather-dependent, but the amount of water we’re using here has not increased, even though we’ve grown a lot,” Thane says. “I think that’s all related to water conservation. Our community has gotten a lot smarter on water usage.”

Advice for heavy users

The city first adopted a two-tiered structure; it has since evolved to four tiers. Most residential customers fall into the first two tiers. Customers in the higher tiers often are referred to the city’s water conservation coordinator, Jessica Woods. A state-licensed irrigator, she visits customers to advise them on good practices and on how to maintain or set the controls on their irrigation equipment.

“We’ve had tremendous population growth, and all these new houses have irrigation systems,” Woods says. “Most of the time when I go to someone’s house, it’s because they have an extremely high water bill, and they are just shocked about how much water they use.”

“I’m there to prove that they are using that much water and to help them bring their usage down. We just have so many people who are overwatering. I’m a friendly face that goes over and tells them what to do. It’s a lengthy process. We talk to the customers, and they can ask all the questions they want. I always joke that their water bill is paying for the service.”

Rebates for equipment

Round Rock has spent as much as \$68,000 a year on rebates to customers who purchased water-saving toilets, washing machines, irrigation upgrades or rain-water harvesting equipment. In some years rebates have also covered lawn aeration and water-saving faucets or showerheads. Sometimes more than 500 customers per year receive rebate.

“One of our most popular rebate programs is toilet replacement,” Woods says. “Because everybody uses the toilet every day, if we can get some of those old



PROFILE:
Utilities and Environmental Services Department, Round Rock, Texas

POPULATION:
124,434

AREA SERVED:
37.7 square miles

PEAK WATER USE:
146 gallons per capita per day

WEBSITE:
www.roundrocktexas.gov/city-departments/utilities-and-environmental-services



Water conservation coordinator Jessica Woods talks with a customer about her irrigation system evaluation.

“If you cut down your water loss, you save money.”

Michael Thane

high-water-use toilets out of the houses and get new efficient toilets in, then we are automatically reducing water use year-round, every day.”

From 2010 through 2019, 1,469 customers collected rebates for toilets, which covered half the cost up to \$500 per home. The city advertises the programs through a newsletter inserted in water bills and distributed as an e-newsletter, through social media accounts and video monitors in city buildings. Woods thinks word-of-mouth also helps. The rebate budget is usually expended before the end of the year.

Water meter upgrade

Over a five-year period, Round Rock upgraded manual reading to a system that is compatible with advanced metering infrastructure. The city first went to drive-by reading and later added antennas and repeater sites. Now, customers have an online portal they can use to pay bills or monitor water usage.

About half of residential customers have registered through the online system. “Probably most of them registered because they wanted to pay their bills online, but we hope they are starting to use it to see how they use their water,” Thane says. “We are also using that system to notify customers when they have leaks.”

Internal monitoring sets off an alarm at the utility when there has been continuous water flow for 24 hours at any meter. The utility gets a list of those meters daily and notifies the customers to minimize wasted water and avoid the risk of property damage.

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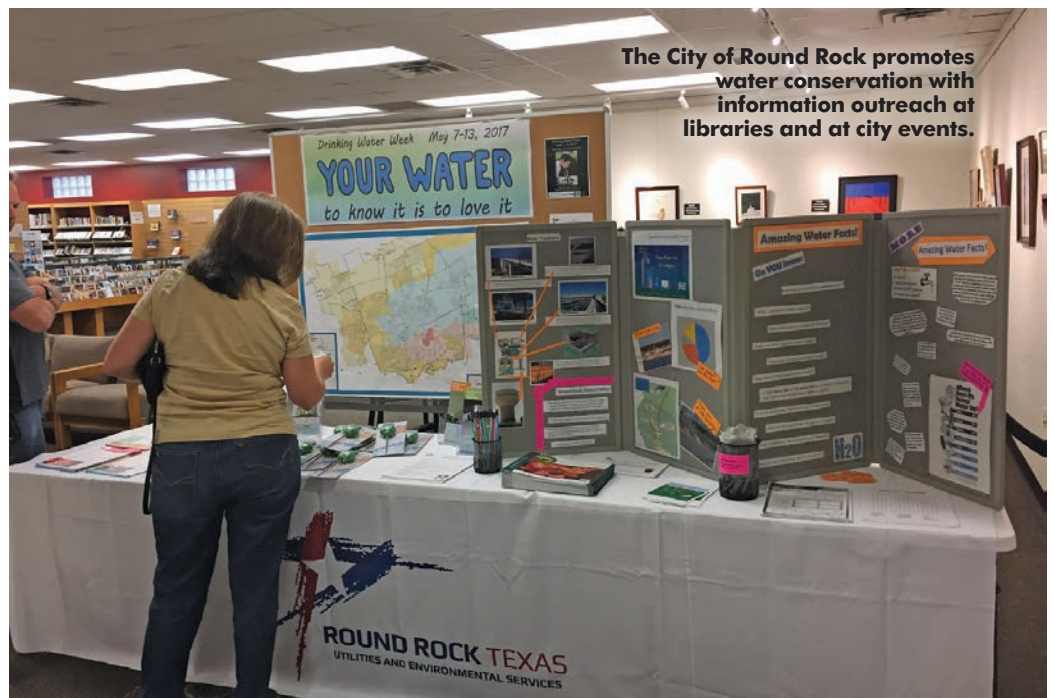
“I think we’re down to about 3-4% where we do not know where the water is going. That’s pretty incredible. At the end of the day, it’s all about being efficient and cost-effective in how we operate.” ♦

Minimizing losses

The utility is also proactive about finding leaks in its own pipes. In older parts of the city, Round Rock has been using pipe bursting to replace the old asbestos-cement pipes with high-density polyethylene. Every spring a contractor surveys pipes in parts of the city to find less obvious leaks. The contractor, JBS Associates of Austin, surveyed more than 210,000 linear feet of pipe in 2020 and identified 23 leaks totaling more than 100 gpm.

“We spend about \$2 million a year doing that, and our city council wants to do more,” Thane says. “At the end of the day, if we’re reducing leaks in the system, that’s water we paid for, water we treated, water we pumped. If you cut down your water loss, you save money.”

Round Rock tries to track all the water it pumps. “When the fire department has a fire, we estimate how much water they use and we track that,” Thane says. “If there is a construction project, and they are flushing water through a line, we track that. We have the meter loss factor. We track all these things, so we know exactly where



The City of Round Rock promotes water conservation with information outreach at libraries and at city events.



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MITIGATING PERFORMANCE BIAS

More objective employee reviews can reduce turnover, boost engagement and motivation

By Ken Wysocky

Despite our best intentions, we all have biases, both conscious and unconscious. And in the workplace, these biases — defined as systematic beliefs that make us favor one thing over another, often resulting in errors of judgements and unfair results — are as common as clogged sewer lines.

But with an increasingly sharp focus on diversity, equity and inclusion (DEI) in today's workplace, organizations are paying more attention to bias mitigation strategies than ever before. One particular area of emphasis, for example, is eliminating biased hiring practices, which range from the way job postings are worded to how resumes are screened to the ways interviews are conducted.

“It’s important to note that you can’t completely eliminate bias — it’s a systematic kind of error in our thinking.”

Kristen Swigart

“Biases are particularly serious in making high-stakes decisions about people — things such as hiring, promotions and performance reviews,” she continues. “These are very consequential moments in time for both employees and organizations, so it’s really important to take as many steps as possible to mitigate biases in those processes.”

When bias creeps into performance management, organizations runs the risk of not promoting or rewarding the right people — employees that deserve greater compensation or to hold a higher position, Swigart says.

“But ultimately, performance bias also can negatively impact productivity,” she notes. “When employees sense bias, it undermines their perception that things are objective and fair and that can lead to reduced productivity, less sense of belonging, lower levels of engagement and higher turnover.”

In addition, performance biases also contribute to pay gaps between men and women.

But there’s another area that also deserves scrutiny: biases in performance reviews.

“I wouldn’t say performance bias is something new, but it’s just perhaps bubbling to the surface,” says Kristen Swigart, a senior people scientist at Culture Amp, a consulting firm that helps organizations improve employee engagement, retention, diversity, development and performance. “Organizations are focusing on DEI, most importantly that equity piece — honing in on all aspects of decision-making to ensure systems and processes are equitable.”

Detecting bias

How can organizations determine if performance-review processes are biased? Swigart says there are ways to audit performance tools and processes. These audits look for rates of promotion, for instance, among different groups of employees, as well as examine the kinds of feedback that managers give to employees, or that peers give to each other.

“It’s important to note that you can’t completely eliminate bias — it’s a systematic kind of error in our thinking,” Swigart notes. “So what we want to do is aim to mitigate and minimize biases.”

Furthermore, after implementing strategies to mitigate biases, it’s critical that organizations monitor how successful they are by performing periodic audits.

“You can’t just create a process and then never return to it again,” she says. “You need to audit processes, too, in order to ensure the strategies continue to reduce bias over time.”

Many kinds of bias

There are many types of performance bias. A common one is gender bias. Research shows that men tend to receive more specific and work-related behavioral feedback while women are much more likely to receive vague or personality-based feedback.

Why does this happen? Psychologists explain it with a concept called role-congruity theory, where for a variety of long-standing, well-ingrained societal biases, men are seen as more suited for leadership positions while women tend to be seen as less stable, which creates the proverbial “glass ceiling.”

Other kinds of performance bias include:

- **Recency bias**, where managers judge employees on what they did well or poorly in the near past instead of looking at overall performance.
- **Primacy bias**, in which a positive or negative first impression outweighs overall performance.
- **The halo- or horns-effect bias** — a tendency to let one good or bad trait to take precedence over others.
- **Centrality bias**, in which managers give all of their direct reports middle-of-the-road performance grades — threes on a scale of one to five, for instance — to avoid appearing to be extreme or hurting employees’ feelings.
- **Similar-to-me bias**, where managers give higher marks to employees that possess the same skills, interests, opinions, backgrounds, etc. as theirs.
- **Idiosyncratic-rater bias**, in which a manager give employees high skill-evaluation ratings if they’re great at something he or she does poorly, or

We invite readers to offer ideas for this regular column, designed to help municipal and utility managers deal with day-to-day people issues like motivation, team building, recognition and interpersonal relationships. Feel free to share your secrets for building and maintaining a cohesive, productive team. Or ask a question about a specific issue on which you would like advice. Call editor Luke Laggis at 800-257-7222, or email editor@mswmag.com.

conversely gives employees lower marks for doing things the manager believes he or she does very well.

- **Confirmation bias**, where managers specifically look for data or interpret information in ways that confirm their pre-existing beliefs.

Bias mitigation strategies

One way to mitigate performance bias involves using more structured review tools to collect feedback. When review tools are unstructured, it enables biases to creep in because there’s no defined criteria; that, in turn, creates a vacuum in which managers define performance criteria based on their own biases and intuitions, Swigart says.

A good example of a structured review tool is a so-called situation-behavior impact model that relies on a fill-in-the-blanks approach instead of what Swigart calls “a big, open-ended box.” It starts with a manager picking a certain situation he or she has observed (either positive or negative). Then the manager describes the behavior observed, followed by the impact of the behavior, which then serves as a starting point for a two-way conversation.

For instance, a manager can explain that last week during an important client meeting (the situation), an employee interrupted the manager’s presentation (a specific behavior, stated factually without judgment), which made the manager lose focus. That then caused frustration and embarrassment (the impact).

Or conversely, during an important client meeting, the manager was fumbling for information that the employee gracefully supplied and tactfully offered without being asked — an impressive display of emotional intelligence and keeping cool in a high-pressure situation.

“This approach allows feedback to be more constructive and meaningful and ultimately more actionable,” Swigart says.

Use different rating scales

Another way to eliminate performance bias is to use a rating scale with fewer options, such as four instead of five. A typical rating scale with five evaluation options — below average, slightly below average, average, slightly above average and above average — makes it easy for managers who want to avoid making tough decisions because they can give everyone the average rating.

Moreover, there’s rarely any definition of what each ranking means, which allows managers to impose their own criteria onto the rating scale. The danger of that is what looks like average to one person may perhaps be above or below average to someone else.

So Swigart recommends using only four rating options, with only one negative, or low-performance, option and three positive options that distinctly differentiate between good on one end and exceeds expectations at the top end.

“This approach reduces leniency bias,” she explains. “When managers avoid confrontations with employees, it comes from a good place. But it can skew the objectivity of the data and make it difficult to differentiate between employees.

“If everyone gets an above-average rating, for example, it’s hard to distinguish who to promote,” she adds. “And this kind of rating system shows employees that extra effort and stellar performance gets you more than just an average or above-average rating. Ultimately it becomes a more engaging and motivating process for employees.” ♦

“You can’t just create a process and then never return to it again.”

Kristen Swigart



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Sheila Joy is executive director of NASSCO. She can be reached at director@nassco.org.

NASSCO RELEASES NEW GROUTING SPECIFICATIONS

Guidelines cover pipeline packer injection capital grouting and pre-rehabilitation grouting

By Sheila Joy

After years of hard work from its Infiltration Control Grouting Committee, NASSCO has published two new grouting specifications: Pipeline Packer Injection Capital Grouting, and Pipeline Packer Injection Pre-Rehabilitation Grouting V2.10.

First published in 2014, the Suggested Standard Specifications for Pressure Testing and Grouting of Sewer Joint, Laterals and Lateral Connections quickly became the choice grouting document for engineers and municipalities. Updated for 2021, that document has been enhanced and renamed Pipeline Packer Injection Pre-Rehabilitation Grouting.

Available for contractors, engineers and system owners to download for free at nassco.org/resources/nassco-specification-guidelines, Pipeline Packer Injection Pre-Rehabilitation Grouting addresses the needs to eliminate infiltration prior to installing other rehabilitation methods and the ability of chemical grouting to act as a complementary technology after installation.

The second specification, Pipeline Packer Injection Capital Grouting, was developed by NASSCO's Infiltration Control Grouting Committee to address long-term grouting means and methods that provide pipe stabilization by creating a pipe cradle-like stability in the bedding and a volumetrically significant, long-term, water seal outside the pipe. This will eliminate all groundwater and rainfall induced infiltration entering a defect or leak-

ing joint. Installed per these new industry standards, it has an anticipated service life of 25 years or more.

"Traditional grouting practices focused on placing a minimum amount of grout in the pipe gasket space and immediately outside the defect," says John Manijak, ICGC chairman. "This historically produced the desired decrease in infiltration but did not achieve pipe stabilization and generally resulted in a shorter service life. NASSCO's ICGC has spent several years developing the new specifications for capital grouting while still recognizing the need to quickly eliminate infiltration when installing other rehabilitation technologies. This resulted in the offering of two separate specifications, one for pre-rehabilitation grouting and a second for capital grouting. ICGC has also been busy working toward the release of a white-paper detailing the research and proven technology behind the capital grouting methods that achieve the pipe stabilization and long-term seals described in the new specification."

In addition to online access, NASSCO is encouraging engineers and municipalities to download and print the 2021 specifications for use in their upcoming projects.

Pipeline Packer Capital Grouting Specification and Pipeline Packer Pre-Rehabilitation Grouting Specifications are available on the NASSCO website. ♦

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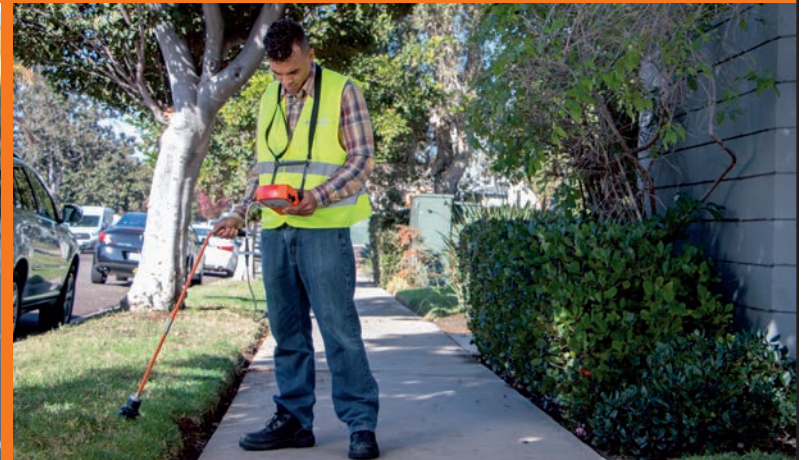
* Data provided by the ASCE Manuals and Reports on Engineering Practice No. 92, "Manhole Inspection and Rehabilitation", 2008 Update.



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NAME:

Jeff Urbanski

JOB TITLE:

Senior manager of marketing and training

YEARS IN THE INDUSTRY:

20

EMBRACING REHABILITATION

HammerHead evolves with a complete line of trenchless solutions for municipal utilities

By Luke Laggis



“Our role as a manufacturer is to provide contractors with the tools and the support they need to get the job done.”

Jeff Urbanski

HammerHead has become a well-known name in the trenchless industry. From its launch in 1989 with the HammerHead Mole piercing tool to today with a broad range of pipe rehab and replacement products, the company has focused on building tools and equipment to serve customers’ specific needs.

Jeff Urbanski is the company’s senior manager of marketing and training. He has 20 years of trenchless industry experience and played an integral role in developing HammerHead Trenchless University to advocate and support hands-on training and education.

Municipal Sewer & Water recently spoke with Urbanski about the company’s culture, product development philosophy and the future of the industry.

MSW: Tell us a little about the history of HammerHead and how it serves the water and wastewater industry.

Urbanski: The HammerHead Mole piercing tool was initially produced out of a converted chicken coop on one of our founder’s properties. What began as three friends with a drive to create a better earth-piercing tool has transformed into the industry’s most complete offering of trenchless solutions from a single source. The evolution of HammerHead Trenchless encompasses a focus on trenchless technologies that service the entire life cycle of the pipe, embracing the rehabilitation and replacement of existing infrastructure.

MSW: How do you see the sewer and water infrastructure rehabilitation industry evolving?

Urbanski: As awareness of our failing infrastructure continues to be brought to light with reports backed by the American Society of Civil Engineers, the demand for cost effective and environmentally safe techniques to rehab or replace sewer and water pipes is going to continue to rise at a rapid rate. With this ever-increasing need for effective and economical solutions to address deteriorating underground infrastructure, manufacturers have begun working in conjunction with con-

tractors to ensure their specific needs on the job site are met. This idea of incorporating the voice of the customer into the development and design of new technology is something that HammerHead takes a great deal of pride in. Our role as a manufacturer is to provide contractors with the tools and the support they need to get the job done, so why wouldn’t we centralize their frame of reference in everything we do?

The concerns of our customers are at the forefront of what we do at HammerHead. With municipalities specifically, we see the leading concern being tax dollars. With very limited budgets coupled with water mains breaking at an astronomical rate, it can be cumbersome for municipalities to keep up with the current rate of aging infrastructure. So, with this in mind, it is critical that we continue to develop solutions that are cost-effective, require less manpower and can be performed more efficiently to allow municipalities to get more out of their budgets and save taxpayers money. With this focus as the industry continues to evolve and strive for technological advancements, I think the capabilities of light-curing technology will be a prominent focal point. The power of light-curing technology has already had a profound impact on the rehabilitation of sewer and water infrastructure and we’re only scratching the surface at this point. We’ve taken the CIPP process that can span over the course of several hours with traditional curing methods, but with light curing it allows contractors to accomplish the process in a matter of minutes! It will be very exciting to see how we can continue to build off of this in order to support the advancement of the industry.

MSW: How has your Rehab & Replacement Division evolved to meet the needs of utilities with aging infrastructure and limited budgets?

Urbanski: With our Rehab & Replacement Division we are redefining what the phrase “R&R” means. When people think R&R the first thing that comes to mind is vacation. Well, this is about solving problems.

When HammerHead first entered the industry, piercing tools was our foundation, but as we came to understand the entire perspective of the industry the demand from the municipal, commercial and residential markets as well as gas and water utilities set HammerHead on our path to rehab and replacement. The very essence of HammerHead's Rehab & Replacement Division originated from the voice of the customer.

HammerHead's core focus on the rehab and replacement of underground infrastructure provides customers with the versatility needed to approach any job site. From a rehabilitation standpoint, we offer point repair and CIPP solutions. Point repair solutions are utilized when only a segment of the pipe is damaged, whereas CIPP is implemented when damage exists along the entire length of the pipe. Whether it be a point repair or CIPP, both options extend the service life by up to 50 years.

If the pipe is at the end of its life cycle and is beyond the point of rehabilitation, the existing pipe can be burst while simultaneously pulling in the new replacement line by utilizing our Same Path Technology. The "Replacement" sector of our division is also able to support gas utilities with pipe slitting and pipe extraction methods. In these scenarios, the existing gas line is split or completely extracted from the ground while once again pulling in the replacement line at the same time.

The concept of the Rehab & Replacement Division deviates from the one-size-fits-all mentality and provides a variety of solutions for municipalities to essentially — and safely — do more with less.

MSW: How has the company as a whole evolved over the past eight years under the Charles Machine Works umbrella?

Urbanski: When HammerHead was initially acquired by Charles Machine Works, it was distinctively known for the HammerHead Moles. HammerHead supported areas of pipe replacement but it wasn't until we entered the CIPP market that we recognized the potential for the rehabilitation of existing infrastructure. As the organization continued to analyze the underground construction industry there was a lot of excitement around the opportunity for growth in rehabilitation. HammerHead has grown tremendously and now as a division of The Toro Company we feel that growth is only going to continue, and we could not be more excited for what is to come!

MSW: Does the larger corporate framework provide more opportunity for collaboration and partnerships?

Urbanski: Absolutely, yes! The Toro Company is an incredible organization, which is extremely diverse and embodies a significant amount of expertise that HammerHead never had access to before. The Toro organization brings a lot to the table especially when it



comes to international strategy and business strategy ideas. The acquisition has been extremely positive and I can truly say that the best is yet to come.

MSW: What kind of solutions and capabilities does HammerHead provide municipal utilities?

Urbanski: When it comes to solutions and capabilities for municipal utilities, we offer more than just a product or piece of equipment; we offer innovative and industry-leading training as well as unmatched service and support for the longevity of your HammerHead product. The offerings of our Rehab & Replacement Division include tools needed for large-scale infrastructure as well.

On the rehabilitation side, we offer large-diameter point repair solutions (up to 60 inches in diameter) as well as a mainline CIPP system for gravity pipe, pressure pipe and water pressure pipes for potable water. From the replacement aspect, we offer both pneumatic and static pipe bursting options with capabilities to upsize the new replacement pipe being pulled in. We see contractors that purchase and install our product performing this type of work, but we also see many municipalities performing the work in-house by undergoing training with us at our HammerHead University and in the field with our application specialists.

“When it comes to solutions and capabilities for municipal utilities, we offer more than just a product or piece of equipment.”

Jeff Urbanski



“HammerHead University has the tools to simulate any job site.”

Jeff Urbanski



MSW: Tell me about the philosophy behind HammerHead University.

Urbanski: Like many things at HammerHead Trenchless, the inception of our HammerHead University came from the voice of the customer. The key thing we want to do is create an innovative educational experience. Trade schools are great but we don't see many trade schools training students on trenchless technology. So, we built a comprehensive curriculum that offers in-person and virtual training as well as an eLearning capability that will be available soon. The cool thing about having those different elements is that everyone learns differently. Some people must do it, some people need to read it, some people need to hear it. Some people need a combination of everything, and HammerHead University achieves all that and more.

For in-person training, we have a 5,000-square-foot facility designed specifically to provide hands-on learning opportunities in a distraction-free and risk-free environment for trenchless contractors, installers, project engineers, utility companies and municipal crews. One of the amazing capabilities of the HammerHead University is job-site simulation. Whether it be working in a two-story facility, a basement, or even a manhole in a city street, HammerHead University has the tools to simulate any jobsite.

MSW: Do you sell direct to utilities or go through distributors?

Urbanski: HammerHead is unique in the sense that our R&R Products are almost exclusively sold direct to customers. As a component of our direct sales, we have an ecommerce platform for consumables or smaller parts at www.hammerheadshop.com. Other categories like our gas utility products and the HammerHead Mole are sold through the Ditch Witch dealer network.

MSW: What's on the horizon for HammerHead, are new product lines in development?

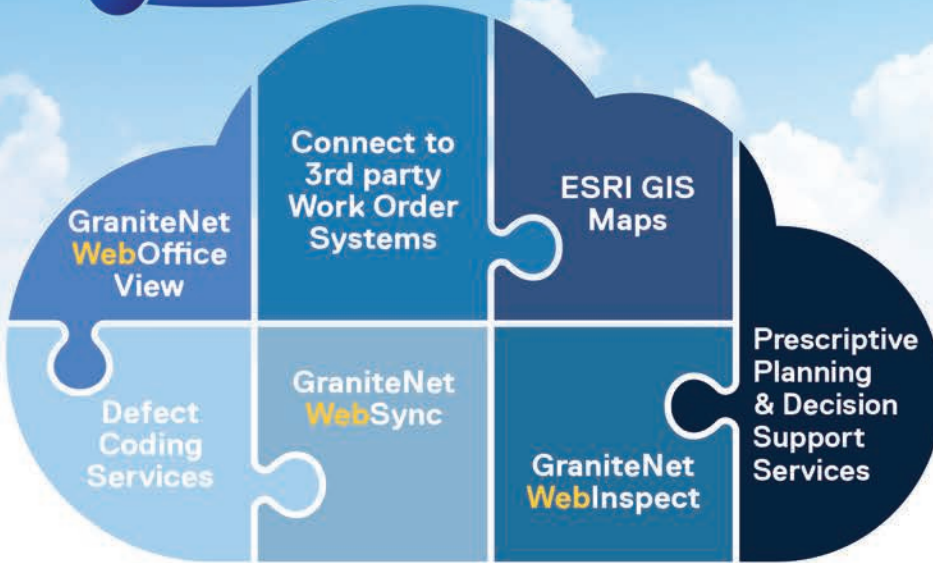
Urbanski: Well, now being a publicly traded company, we can't really tell you any of our secrets that are coming. But as I said earlier, Toro prides itself on developing new products and HammerHead is never going to stop. Every day. We're working on multiple new opportunities and things that will be coming down the pipeline. You can see just in the last year, we launched a brand new 100-ton bursting unit the 100XTR and we launched a new HG550 winch, a 5.5-ton pulling unit. Every year this is going to continue with Hammerhead, we're not going to slow down. And it doesn't have to be just the development of a product. It can be development of services or aspects. You're going to see a lot more from HammerHead. On the education piece you're going to see education in our learning management system through Hammerhead University, you're going to see learning in a variety of new ways, because that is also a product whether you recognize it or not. It can be a service; it can be a variety of ideas. Hammerhead is not going to stop offering new solutions because our customers are the lifeblood of our company and that's what keeps us going. ♦

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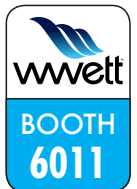
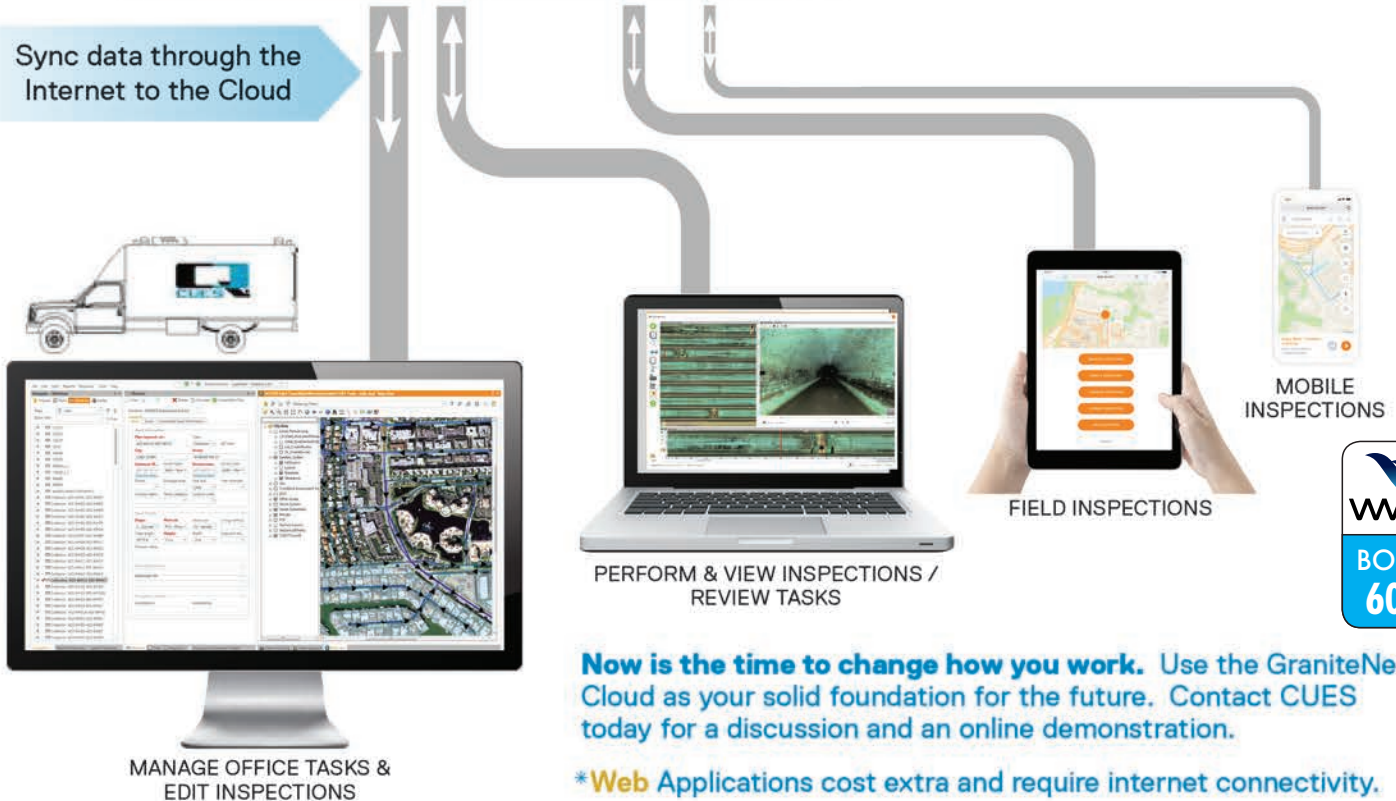
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PIPELINE AND INFRASTRUCTURE, HYDRANTS

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The **ProVore** grinder from **Liberty Pumps** is designed for use in applications where the addition of a bathroom or other fixtures below sewer lines requires pumping. It has the same V-Slice cutter technology used in the Omnivore Series. Powered by a 1 hp motor, this smaller grinder is designed to operate on a standard 115- or 230-volt circuit, requiring only a 20-amp breaker. No special wiring is needed. The pump comes with a 2-inch vertical-style discharge and a standard leg pattern matching the LE Series. This allows for an easy retrofit into existing systems, according to the maker. Compact factory-assembled systems are available in both simplex and duplex versions: the ProVore 380 and ProVore 680. **800-543-2550; www.libertypumps.com**

Vertiflo Pump Co. Series 1600

Vertiflo Pump Co.'s Series 1600 horizontal close-coupled, vortex end-suction pumps have a wide range of applications including food processing solids, wastewater treatment, pollution control, slurries and solids. They have capacities to 1,600 gpm, heads to 170 feet TDH and operate at temperatures to 250 degrees F. These pumps are designed with a variety of constructions such as cast iron, 316 stainless steel fitted, all 316 stainless steel, alloy 20 or CD4MCu. They are designed with a convenient back pull-out cost-saving feature to allow for easy inspection or maintenance without disturbing the piping to the pump. The impeller has a fully recessed design, which accommodates passage of solids. All impellers have wiping vanes, which reduce axial loading and prevent dirt from entering the sealing area. The impeller is keyed to the shaft and an impeller locking screw assures positive attachment. **513-530-0888; www.vertiflopump.com**

VALVES

Flomatic Valves Model 4082 Ball Check Valve

The AIS-compliant **Model 408² Ball Check Valve** from **Flomatic Valves** is a suitable solution tailored to meet the harsh complexities of congested wastewater systems. Available in epoxy-coated ductile iron or stainless steel, it's known for its self-cleaning BUNA-A vulcanized metal ball, which prevents modern trash from interfering with its functionality. Its simple but efficient design includes a clean-out port that permits access to the inside of the valve without removal from the pipeline. **800-833-2040; www.flomatic.com**

JAECO Fluid Systems stainless steel check valves

JAECO Fluid Systems offers a broad line of inline check valves to control backflow of critical fluids. They feature male-x-male NPT threads and a durable design that is suitable for injection line and metering pump applications. They are 316 stainless steel, compact and provide maintenance-free, dependable service. Options include spring-loaded ball or poppet valves with 2 or 10 psi cracking pressure and Viton or PTFE O-rings. **877-778-3456; www.jaecofs.com** ♦

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New raw water pumping station increases drinking water production in Panama



Problem:

As Panama has grown there has been an increasing need for safe drinking water. In 2018, the National Aqueducts and Sewerage Institute made the decision to build a new raw water pumping station to increase drinking water production at the water treatment plant that serves about 60,000 inhabitants of Changuinola, Guabito, El Silencio and El Empalme.

Solution:

The goal was to increase the reliability of the system, which was important to residents given the deterioration of the existing raw water station. The new raw water pumping station was designed to extract and filter water from the Changuinola River (water can have a high sediment content, which makes filtering critical) and then pump the water to a current drinking water treatment plant located 2 kilometers away, where it is processed for human consumption. The scope of the project included large PRIMEX control panels that controlled four 350 hp water pumps and seven 5 hp sand pumps to properly filter sediments at the start of the process. PRIMEX also provided variable-frequency drives with line reactors, a 1,600-amp main switch, a PRIMEX pump controller and extensive remote monitoring via the Pump Watch system.

RESULT:

The new raw water pumping station increased production, ensuring that this growing region has plenty of sediment-free drinking water for years to come. **888-342-5753; www.primexcontrols.com**

Signage designed to provide durability and high visibility

Problem:

The health, safety and marketing manager for a western U.S. Oneok compressor station needed to find a solution to marking his fireplugs. The challenges were to make something readable from a long distance and to last in a harsh environment. He wanted crews to be able to see from even 100 yards away which fireplug is in use or closest to a tank.



Solution:

Tech Products solved this by using 3-inch-tall lettering on the signs they produced, with a strong contrast of black on a yellow background. This made the product very easy to read and see from long distances. The company was also tasked to make the product last in tough environmental conditions. The Everlast product line was developed with pipelines, electric utilities and railroads in mind. It has been in production since 1989 and has proven to have a life expectancy of over 40 years in any environment.

RESULT:

The operators of the compressor station have been satisfied with how the durability of the signs, and with how visible they remain. **800-221-1311; www.techproducts.com**

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Product Spotlight

Replacement system takes just minutes to pull new pipe in place

By Craig Mandli

Pipe pulling for service pipe replacement is a trenchless technology quickly growing in popularity. The technique removes old water or gas pipe from the ground by pulling it with a hydraulic winch and a special steel pulling cable, while at the same time, a new pipe is towed into place along the same bore path created by the extracted old pipe.

The Kobus Pipe Puller 400 is a trenchless pipe replacement technique that extracts lead, steel, copper and plastic service pipes quickly and safely while towing in a new service pipe, in one single operation.

According to Kobus president Tom Atienza, the concept is simple. First, a strong steel pulling cable is fed through the old pipe being removed. The pulling cable has a special pulling attachment on one end, which engages with the old pipe. The other end of the cable is fixed onto the pipe puller spool, which is driven by two powerful hydraulic motors. The spool safely and continuously winds up the pipe as it is removed from the ground, and a new copper or polyethylene pipe is towed into place following the same pathway as the old pipe.

“It’s a good fit for the industry because it reduces the carbon footprint, and is kinder to the environment, as it is removing any lead or



metal contamination in the soil,” says Atienza. “Not to mention the financial benefits of not digging up expensive driveways and gardens and time saved in reinstatement. No road closures are needed, as the machine fits onto a mini excavator with a 360-degree rotating foot, meaning that the mini excavator can sit anywhere around the small pit it is lowered into.”

On average the process of pulling the old pipe out and putting the new one in takes about three minutes. “As the old pipe already has the bore that the new one instantly follows, the risk of utility strikes of other underground services is reduced to next to zero,” says Atienza. “In the end, it also helps remove pipe congestion from under the ground, as there are no dead pipes left over.”

Up to 85 feet of pipe can be extracted in a single pull, meaning the process is ideal for road crossings, replacements under expensive driveways/pathways, or where other utilities may prevent other techniques from being used. **269-216-3916; www.kobus-inc.com**

General JM-1450 electric water jet

The compact, powerful JM-1450 Jet-Set water jet from General Pipe Cleaners uses high pressure water to clear drainlines clogged with grease, sand, sludge and ice. The overall height of the water jet is 34 inches, and removing the easily detachable hose reel drops to the height to 14 1/2 inches. The heavy-duty frame rides on two 8-inch semi-pneumatic tires, and the telescoping handle and removable hose reel make maneuvering easy. The JM-1450 is powered by a 1 1/2 hp sealed motor with a GFCI outlet that drives 1,500 psi, 1.7 gpm triplex pump. On-demand Vibra-pulse technology helps propel hoses down long runs and around tight bends, even in small lines. Safety features include a thermal relief valve to protect the pump from heat damage, a backflow check valve and inlet filter. An optional spray wand is also available. **800-245-6200; www.drainbrain.com**



HammerHead Trenchless 100XTR radio remote system

The HydroBurst 100XTR by HammerHead Trenchless has a 100-ton capability rated for up to 16 inches in diameter, yet it is compact enough for use on pipe down to 4 inches. It comes with an easy-to-learn, easy-to-use

radio remote control, freeing operators from the pit to position themselves for the best view of a bursting operation. Lightweight, heat-treated alloy rods feature an API-style joint that resists buckling under the greater thrust loads required by longer burst runs, sweeping bends and encrusted and collapsed lines. Operators can swap power for speed by switching to its 50-ton mode, working up to twice as fast depending on the job’s requirements. Hydraulic leveling jacks allow for adjustments on the fly as needed, keeping the machine on-grade without interrupting bursting operations. **800-331-6653; www.hammerheadtrenchless.com**



PPG Protective & Marine Coatings coating solutions

PPG’s expanded portfolio of coatings includes solutions for a range of wastewater management processes, including collections, primary and secondary treatment, sludge handling and disinfection. A comprehensive range of coatings provide optimum corrosion and chemical resistance based on the environment (immersive or atmo-



spheric), the substrate being protected (concrete or steel) and specific performance requirements. The expanded portfolio combines PPG RAVEN and PPG AQUATAFLEX coating systems for aggressive underwater concrete applications with a variety of proven PPG coating solutions for exterior and interior steel tanks, basins and facility infrastructure. **888-977-4762; www.ppgpmc.com**

Envirosight ROVER X SAT II all-in-one lateral system

Envirosight's new ROVER X SAT II lateral launch inspection crawler maneuvers around obstacles and challenging pipe geometries to rapidly detect gas line cross bores in sewers and other hard-to-reach defects. The crawler can travel as far as 984 feet down mainlines at speeds up to 98 feet per minute, then launch its camera probe as far as 147 feet down adjoining service connections, at up to 23 feet per minute. The ROVER X SAT II also features a belt-driven push mechanism that minimizes wear on the pushrod while maximizing pushing force. The design, which is easy to clean and has field-replaceable belts, is intended to increase uptime and keep maintenance costs low. Steerable eight-wheel drive makes it easier to move past debris, roots, offsets and protruding taps. During launch, the pan/tilt lateral camera with detachable steering wand navigates through bends and branches in lateral lines. **866-936-8476; www.envirosight.com**



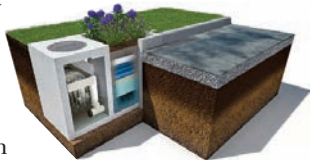
Industrial Flow Solutions OverWatch pump system

Industrial Flow Solutions' OverWatch pump system lifts influent at the point of entry, eliminating the wet well. Effluent is contained, eliminating odors and reducing maintenance. The stainless-steel body is designed to withstand the effects of corrosion from harsh materials and solutions, making OverWatch an ideal solution for the municipal, industrial and commercial industries. In addition, the system has HMI touchscreen controls to further simplify operations. **860-631-3618; www.flowsolutions.com**



Advanced Drainage Systems EcoPure BioFilter

Advanced Drainage Systems' EcoPure BioFilter urban stormwater management solution is engineered for low-impact developments and green infrastructure projects requiring design flexibility, application of diverse plant life and hassle-free installation and maintenance. The device, which is available in multiple sizes ranging from 4 feet by 8 feet to 10 feet by 20 feet, is appropriate for new construction and retrofit commercial jobs. EcoPure BioFilter is NJCAT-NJDEP approved and can be easily configured to fit curb inlet, direct-pipe connection and roof drains. The device arrives on site ready to be installed, and its design delivers a water flow rate advantage of 60 gpm. In some instances, fewer systems may be needed because of EcoPure BioFilter's capability to handle more water. **800-821-6710; www.adspipe.com**



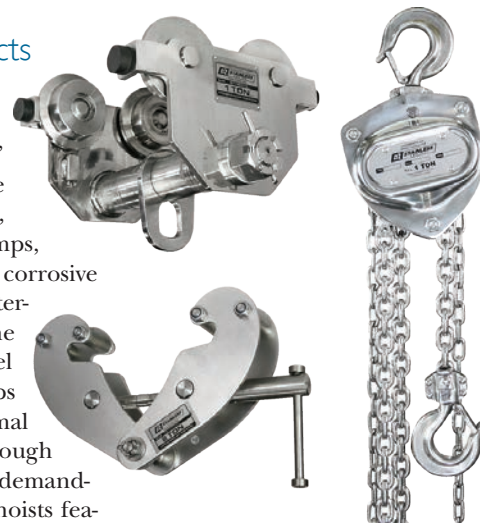
Century Products Falcon FR hole opener

The Falcon FR (field replaceable) hole openers from Century Products are available in 18- to 30-inch sizes with 12.5- and 17-inch cutters available in TCI conical, TCI chisel or milled tooth configurations. With the ability to go from pilot hole to 24 inches in a single pass, the Falcon FR design reduces

SPECIAL REPORT

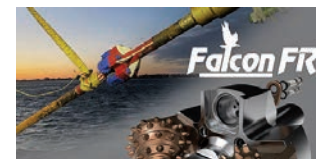
OZ Lifting Products stainless series

OZ Lifting Products' stainless steel range includes chain hoists, trolleys and beam clamps, all designed for use in corrosive environments. The centerpiece of the line is the lightweight stainless steel chain hoist, which helps lift loads with minimal effort but is durable enough for the industry's most demanding applications. The hoists feature fully enclosed gearing; fully machined lift wheel; weatherproof holding brake; roller bearings on all gears and shafts; and forged stainless steel hooks and safety latches. Chain hoists, like the trolleys, are available in 1/2-, 1- and 2-ton capacities. The stainless push beam trolley fits most I, S and W beams and has precision



ball bearing trolley wheels. The beam clamps are available in 1- and 2-ton capacities. All products in the line are made from Type 304 stainless steel and come with individual test certificate and serial number. **800-749-1064; www.ozliftingproducts.com**

downtime, improving bottom-line performance. The solid body design virtually eliminates cutter flex, maximizing the energy directed to fracturing rock. The hole opener is designed for rigs 200,000 pounds and less. **262-820-3600; www.centuryproducts.net**



GeoTree Solutions GeoSpray HCE geopolymer mortar

GeoSpray HCE (highly corrosive environments) is a new addition to GeoTree Solutions' GeoSpray range of geopolymer mortars that are hand or spray cast to form a pipe within a pipe. The material, which sets stronger than concrete, has been engineered to withstand the corrosive environments of sewers, areas storing or transporting industrial water, manholes, wet wells, wastewater, lift station tanks and containment areas (pH less than 2.0 and high hydrogen sulfide environments). GeoSpray fiber-reinforced mortar that looks and feels like Portland cement, but with higher performance properties. The unique mortar chemistry provides superior flexural and compressive strength, as well as ultra-low porosity and high self-bonding which eliminates cold joints. GeoSpray geopolymer is intended for use through multiple application techniques including pouring, troweling, spraying, or centrifugal/spin casting. **877-489-4909; www.geotreesolutions.com** ♦



Grout school registration open for March

Avanti Grout, CUES and Logiball are partnering together on March 23-24 for its annual two-day Municipal Sewer Grout School in Tavares, Florida. All levels of experience are welcome and can participate in each of the break-out and classroom sessions. An emphasis will be placed on grouting, safety, operating, testing and troubleshooting equipment, making sure the chemical grout mix has the right mixture, and how to determine how much grout is used per joint or lateral. The school will present technical information on lateral and mainline test and seal packer operation and maintenance, mixing and optimizing AV-100 acrylamide grout performance, review and demonstration of new NASSCO/ICGA grout specifications, and more. To register, go to conta.cc/33uXg8d or contact Jessica Williams at 281-956-3111.

Super Products appoints new vice president of rentals

Super Products has appointed Chris Gittens to take over as the new vice president of rentals after Randy Bueening, the previous vice president of rentals, was promoted to president at the beginning of 2021. Gittens has an extensive background in equipment manufacturing and distribution. He comes to Super Products from Thermo King, where he was the director of dealer development. Prior to Thermo King, he held leadership positions at CLAAS of America and CNH Industrial where he gained experience in financial analysis, strategic planning, dealer development and commercial credit. Gittens holds an MBA and MIA from Columbia University and earned his undergraduate degree from Washington University in St. Louis.



Chris Gittens

Envirosuite executes MoU for partnership with Aeroqual

Envirosuite announced it has executed a Memorandum of Understanding for a strategic partnership with Aeroqual, a manufacturer of air quality monitoring technology. The MoU outlines a framework for the joint pursuit of global strategic opportunities between the companies' mining, waste, wastewater and industrial sectors. Headquartered in New Zealand, Aeroqual has offices in the U.S. and China and is represented by a global network of partners.

Waterline Renewal Technologies acquires Pipe Lining Supply

Waterline Renewal Technologies completed the company's acquisition of Pipe Lining Supply. The terms of the purchase were not disclosed. Founded in 2004, Pipe Lining Supply's management team will continue to manage the company and assist Waterline Renewal Technologies with the integration. Pipe Lining Supply will maintain company-owned distribution centers in Anaheim, California, and Springfield, Missouri, and it will remain a supplier of sewer pipe rehabilitation equipment and materials while continuing to deliver training and customer service.

Liberty Pumps holds ground-breaking celebration at new center



From left to right: Peter Cunningham, chief operating officer; David Williams, director of engineering; Randall Waldron, vice president of sales and marketing; Robyn Brookhart, president and CEO; Dennis Burke, chief financial officer; Don Cunningham, manufacturing manager; and Charlie Cook, chairman of the board.

Liberty Pumps hosted a ground-breaking celebration at the site of its materials center in Bergen, New York. State and local partners as well as Liberty employees attended the event. The 107,000 square-foot expansion will provide additional warehousing and added manufacturing space. It is anticipated to support 30 additional jobs at the family- and employee-owned manufacturer. This will be the third expansion for the company since 2000. Upon completion, Liberty will have approximately 350,000 square-feet of facilities at its corporate campus in New York.

Franklin Electric names new business unit directors

Franklin Electric announced personnel moves and additions within its water systems sales team. Travis Bradley has been promoted to business unit director of industrial and engineered systems. Filling Bradley's previous position, Andrew Schwarze has joined the organization as business unit director of groundwater distributors. Both will be responsible for directing Franklin Electric's product development, sales and support efforts throughout the United States and Canada.



Andrew Schwarze



Travis Bradley

Inframark acquires MR Systems

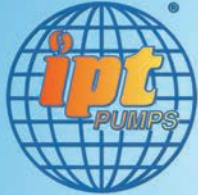
Inframark announced it has acquired MR Systems, an Atlanta-based company that specializes in providing automation, process controls, instrumentation and SCADA systems for the municipal water and wastewater market. The addition of MR Systems to Inframark's existing SCADA division brings a level of scale that will enable Inframark and MR Systems to create an embedded SCADA offering throughout the Inframark portfolio, in addition to their commercial and industrial customer base. ♦



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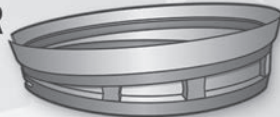
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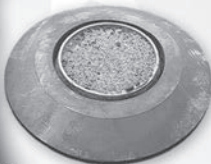
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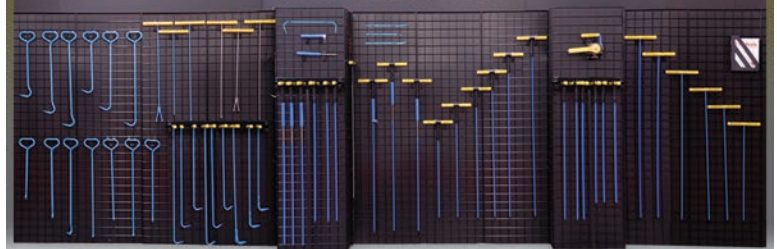


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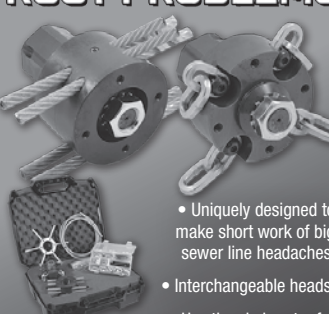
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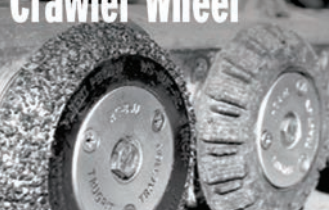
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WORTH NOTING

PEOPLE/AWARDS

Gregg Strakaluse was hired as the public works director for the City of Bakersfield, California. He spent the previous 15 years as the director of the streets and stormwater department for the City of Naples, Florida.

James Clinch was promoted from public works director to assistant city manager for the City of Venice, Florida. He was hired in 2012 as a stormwater engineer.

Charles Seelig was hired as the town administrator for the Town of Bridgewater, Massachusetts. Previously, he served as the town administrator for the Town of Halifax, where, among other things, he helped develop stormwater by-laws and remediation efforts.

The **City of Kenosha** received an Award of Excellence from the Wisconsin Association for Floodplain, Stormwater & Coastal Management for its efforts to mitigate major flooding issues.

The **City of Rogers**, Arkansas, received a Watershed Guardian Award from the Beaver Watershed Alliance for exemplifying watershed management. The city also is initiating a stormwater assessment update to map out stormwater issues and challenges.

Santa Rosa County, Florida, received a \$499,075 award from the EPA Gulf of Mexico Division's Healthy and Resilient Gulf of Mexico. The award category was Building Community Resilience Through the Reduction and Prevention of Nonpoint Source Pollution. The funding allows Santa Rosa County to create a project of innovative green stormwater infrastructure practices to address and improve impaired waters within the Pensacola Bay Watershed. ♦

CALENDAR

Feb. 15-18

International Erosion Control Association Annual Conference, Minneapolis Convention Center. Visit ieca.org.

Feb. 21-24

Water & Wastewater Equipment, Treatment & Transport Show, Indiana Convention Center, Indianapolis, Indiana. Visit www.wettshow.com.

March 2-5

National Utility Contractors Association Annual Convention and Exhibit, Hyatt Regency Hill Country Resort and Spa, San Antonio. Visit nuca.com.

March 13-16

American Society of Civil Engineers Operation and Maintenance of Stormwater Control Measures Conference, Wilmington Convention Center, Wilmington, North Carolina. Visit asce.org.

April 10-13

American Public Works Association Snow Conference, (hotel TBA), Pittsburgh. Visit snow.apwa.net.

April 24-27

American Water Resources Association Spring Conference, Bryant Conference Center, Tuscaloosa, Alabama. Visit awra.org.

May 2-4

Montana Stormwater Association Annual Conference, Holiday Inn Downtown, Missoula. Visit mtstormwaterconference.org.

June 12-15

American Water Works Association ACE22, Henry B. Gonzalez Convention Center, San Antonio. Visit awwa.org.

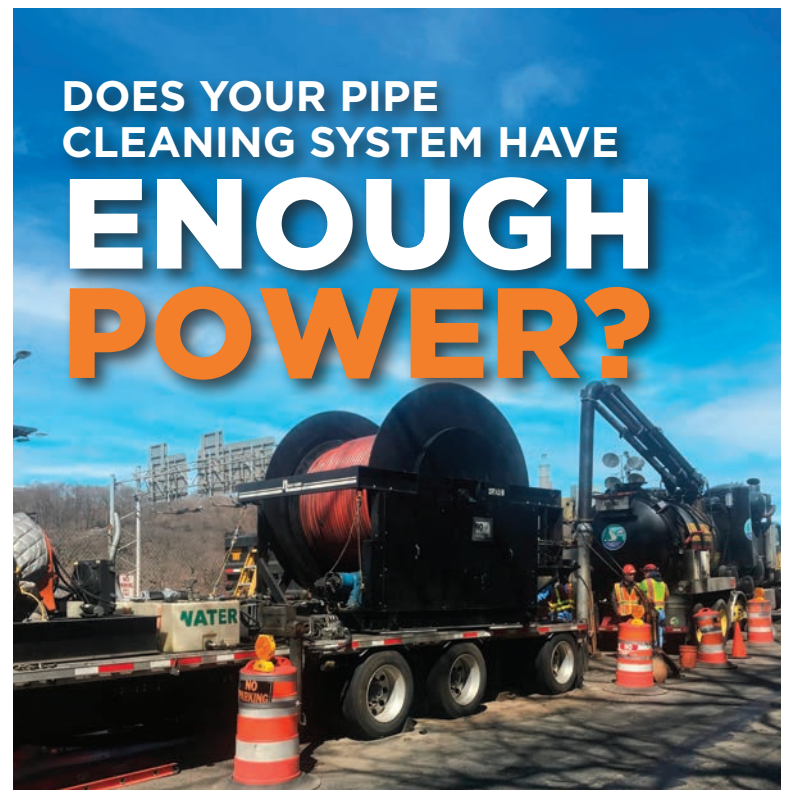
June 27-29

Water Environment Federation Stormwater Summit, Hyatt Regency, Minneapolis. Visit wef.org.

Aug. 28-31

American Public Works Association Public Works Expo 2022, (hotel TBA), Charlotte, North Carolina. Visit pw.xapwa.net.

Municipal Sewer & Water invites your national, state or local association to post notices and news items in this column. Send contributions to editor@mswmag.com.



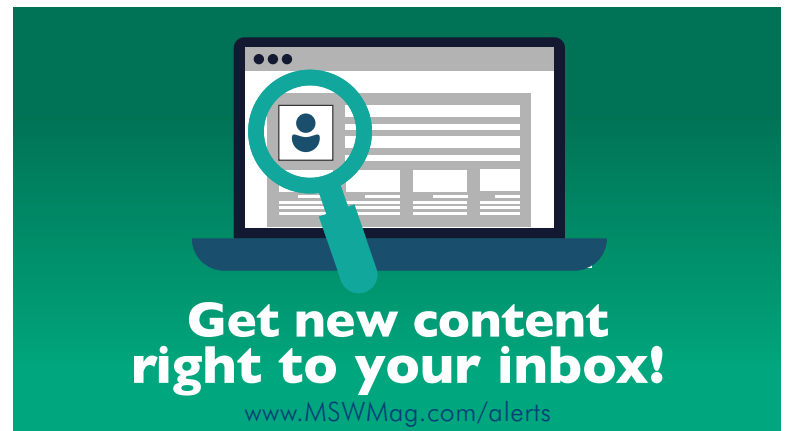
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