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FOR SANITARY, STORM AND WATER SYSTEM MAINTENANCE PROFESSIONALS

October 2020

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Stormwater Compliance Manager
Knox County, Tennessee

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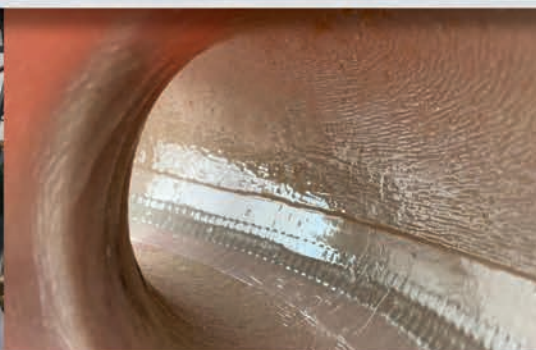


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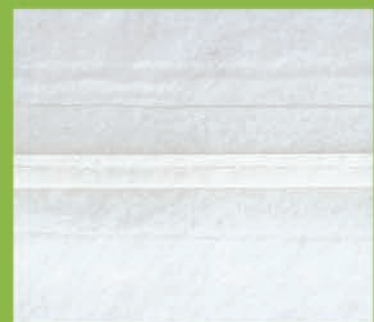
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Luke Laggis

PHOTOGRAPHIC EVIDENCE

Some safety issues are difficult to see, but you can't ever stop looking

The words written about safety in these pages over the years are innumerable. But if a picture is worth 1,000 words, a lot of work can be undone with a single image.

I got an email the other day from a regular *Municipal Sewer & Water* reader. He had very kind words about the magazine but questioned the use of a single photo. The photo, one of several included in a feature about a wastewater utility, presented some safety concerns. In a situation that clearly called for eye and ear protection, and probably a mask, the worker wore only safety glasses.

It's a photo that shouldn't have made the cut. There were numerous factors that led to using the photo, but in the end, in the scramble to wrap

everything up while working from home and dealing with a variety of pandemic-related complications, the photo slipped by. I was worried primarily about getting the issue together and lost focus on something we usually give more attention.

Passive attitudes toward safe practices can't be tolerated.

In that way, using a photo I shouldn't have come about in much the same way safety issues come about on the job site: You're worried about getting the job done, restoring service and reopening the road, and you lose track of seemingly small things along the way.

In my case, the result was actually a nice email pointing out the mistake. On the job site, consequences can be far more severe.

A lot of photos cross my desk every month. Some are good; some are bad. Most illustrate good safety practices, but some demonstrate poor practices, and a few reveal dangerous situations. Those photos stand out. They're easy to recognize, just like major safety issues on your job sites. But then there are the less obvious cases. Someone running a jet/vac truck without ear or eye protection, a pit that's on the borderline of being deep enough to require shoring, holding a jetter hose without gloves, and in many cases, a camera angle that makes it difficult to tell for sure. Any of us might miss it. In your case, that leads to workers taking chances with serious consequences. In my case, I'm promoting — or at least normalizing — that behavior. Neither is good. And again, the consequences are much more severe on your end than mine.

I'll be reminding everyone who works on MSW to pay attention to safety issues in photos, and I hope you regularly take the time to talk safety with your crew. You couldn't do them a bigger favor.

Ultimately, it's a matter of vigilance. Passive attitudes toward safe practices can't be tolerated, and everyone on your team needs to be empowered to point out and correct unsafe practices both in the shop and on the job site.

I'm glad my mistake was pointed out, and you should be glad when someone points out a safety risk on your job site. They're preventing potential disaster.

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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FOREIGN CYBERATTACKS

Protecting Critical Infrastructure

The National Security Agency and the Department of Homeland Security's Cybersecurity and Infrastructure Security Agency recently issued a joint alert warning that foreign hackers are targeting critical infrastructure, including water/wastewater systems. The agencies recommended that critical infrastructure operators take specific and immediate action to secure their systems. mswmag.com/featured

OVERHEARD ONLINE

“Younger generations definitely have less tolerance for being unhappy. They are just not going to stay in a job if it's not fulfilling a purpose that they believe in.”

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Using Data for Decisions

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TAKING STORMS IN STRIDE

Stormwater agency's broad-scale approach includes development, education and a large slate of improvement projects

By Giles Lambertson

Knox County (Tennessee) Watershed Coordinator Roy Arthur, Compliance Manager Natalie Landry and Flood Plain Manager Eddy Roberts (from left) stand on a bridge overlooking a large bioretention pond they designed. (Photography by Martin Cherry)

Knox County, Tennessee, is verdant, picturesque and a perfect illustration of the problems that arise when stormwater collects in volume. The result is flooding, erosion, destabilized ground and pathogenic threats.

The county's Stormwater Management Department, however, has the tools to mitigate the worst of these challenges. These include imaginative public awareness campaigns, community outreach activities that spark citizen involvement, scientific analyses and strategies and, of course, rules.

"When we first started ramping up enforcement in 2006 or so, there was pushback," acknowledges Steve Elliott, director of development services in the county's Department of Engineering and Public Works. "None of the developers wanted to do it. I would say now that most developers understand the importance of the regulations. There's a pretty positive attitude out there, much better than at the beginning."

Colleagues like Natalie Landry, stormwater

compliance manager, agree with Elliott's assessment. "The majority of our regulations have to do with land development. If you disturb the land, that's where stormwater ordinances come into play. I personally don't think they are burdensome. They were introduced in 2008, and developers are pretty used to them. There's not a lot of resistance now."

Early on, the stormwater team focused on the problem of construction runoff, documenting the need for retention structures and ensuring they were actually built. "We put a lot of energy into that problem area, communicated a lot with developers and that helped. Now we rarely get any complaints about runoff from construction sites," Elliott says.

"I would say now that most developers understand the importance of the regulations."

Steve Elliott

Tracy Jones, project manager, focuses on illicit discharges that foul stormwater systems, a critical component in any effort to maintain the integrity of water. "We run into high bacteria counts in less densely populated areas where people aren't tied into a sanitary sewer system," says the 20-year veteran of the office. Agriculture and livestock operations also contribute to high bacteria counts in surface waters.

The public supports this comprehensive regimen of regulations, as well as Stormwater Management's willingness to enforce rules. Landry says citizens "are real quick to report a developer who seems to be in violation. We have done a pretty good job of raising awareness, and people are protective of their streams."

“We have done a pretty good job of raising awareness, and people are protective of their streams.”

Natalie Landry

Floods and sinkholes

There are a lot of streams to protect. Knox County is part of the Great Valley of east Tennessee and contains the headwaters of the Tennessee River. Of the county's 526 square miles, 17 square miles are water, including some 500 miles of rivers and streams. Many of these waterways originate outside the county but are replenished locally by 50 inches or so of rainfall each year.

Landry has been part of Knox County Stormwater Management for five years and performed similar work for other county and state agencies in addition to private-sector work. Her workday now typically includes planning and implementing initiatives for long-term stormwater issues and responding to residents' complaints or concerns.

Looking back at the last two years, she can count 514 instances where stormwater staff acted on complaints and requests for assistance. A significant number of those calls were the consequence of rainstorms that hit the county each of the last two Februaries. The storms were not especially ferocious, but they arrived when soil was already saturated.

“A lot of people experienced flooding for the first time ever. It was pretty much all over the county, particularly in areas where there were sinkholes. A lot of times the flooding was from the slow drainage of high water in the sinkholes,” Landry says.

County engineers studied the disastrous flooding, and two corrective roadway projects are scheduled before another February rolls around. In one case, the county will completely realign a dead-end road so that it runs along adjacent higher ground.

The bedeviling sinkholes are a feature of the east Tennessee landscape. Limestone formations beneath the region's surface tend to erode and create subterranean caverns that eventually collapse, causing surface soils to slump. Some of the resulting depressions in the ground are large and subtle enough to have had homes built in them, though new construction is not permitted in known sinkholes.

In heavy rainfall, runoff will pool in these areas, especially when a sinkhole has no open throat to quickly drain the water. Elliott says solutions include excavating slow-emptying depressions so they can safely accommodate a greater volume of runoff or installing a pump system to move rapidly empty a sinkhole.

The county has a 255-mile network of stormwater pipe as part of its runoff infrastructure. Most of the pipe is in fair condition, according to Jones. Any storm-damaged pipe or pipe segments that residents complain about are fixed.



Signage at the stormwater park explains how the park provides for the community.

Knox County Engineering and Public Works refurbished a developer's retention pond and debris dump into a large natural pond with a walkway with native plants and a bridge.

While there is an ongoing replacement regimen for structures 4 feet in diameter and larger, unless a pipe poses a threat to public health, it's generally deemed good to go.

Good examples

The work of Knox County Stormwater Management isn't all keeping a wary eye on developers and pipes and cleaning up after flood events. Landry says mitigation projects are going on all the time under the auspices of the county's Environmental Stewardship Program. Begun 20 years ago, the cost-share program has completed more than 200 projects to date, each designed to help a property owner restore land and prevent future damage.

In each case, the fix is through green stormwater infrastructure, including plantings and nature-friendly engineering. Each project is designed by stormwater management experts and approved by the property owner. If dirt must be moved, bids are submitted by two approved landscape companies and the project owner selects a winning bid. The owner foots 40% of the project cost and Knox County covers the rest.

The projects include erosion-control work that turns gullies into grassy swales. Sometimes it means collapsing stream shoulders are gently banked and stabilized with riparian plants. A major



PROFILE:

Knox County Stormwater Management (Department of Engineering and Public Works)

SERVICE AREA:

526 square miles (Knox County, Tennessee)

STORMWATER INFRASTRUCTURE:

255 miles of pipe, 2,245 culverts, 840 miles of open ditches, 10,767 catch basins, and 21 county-owned stormwater ponds

STORMWATER EMPLOYEES:

7

WEBSITE:

www.knoxcounty.org/stormwater

“Pathogens from runoff, failing septic systems and overflowing sewer systems create a human health threat.”

Natalie Landry

restoration of Beaver Creek is planned, a tributary that helped swell floodwaters in recent Februarys. Other mitigation efforts involve wetlands protection, rain gardens and permeable paver installations.

Landry cites work at Circle Lake Park as a good example of what can be accomplished. There, a large rain garden was installed with engineered soil and plantings to slow and absorb runoff. Permeable pavers were laid in the parking lot so that rainwater can seep through. The enhancements turned the park into a real neighborhood amenity, Landry says.

In the Cedar Crossing condominium subdivision, stormwater workers and volunteers installed nine rain gardens, created a large bio-retention area and laid permeable pavers at a public entrance patio. Landry says the subdivision had experienced “pretty intense flooding problems. People love it now.” AmeriCorps workers, a labor source that Stormwater Management regularly employs, helped with that project.

The county is also showcasing some demonstration projects on public grounds including the Harrell Road Stormwater Park that was completed three years ago. The park has two wetland ponds that absorb neighborhood runoff, a rain garden and permeable pavers. The project cost \$450,000, with \$350,000 of that coming from two state-wide grants. The rest was covered by individual donations, small grants and county funds.

All of these projects could appear on the sur-



Plans reviewer Marty Pleasant explains how permeable pavers have reduced stormwater runoff.

face as beautification projects, but the purpose of these engineered improvements is to diminish the loss of topsoil, reduce flooding and minimize stormwater pollution.

“Sediment and pathogens are the primary pollutants of concern for Knox County surface water,” Landry says. Moving sediment muddies water, thereby lessening the survivability of aquatic life, and shallowing out streams downstream so they flood more easily. Toxic materials also migrate with loosened soil. “Pathogens from runoff, failing septic systems and overflowing sewer systems create a human health threat.”



A family explores the Harrell Road Stormwater Park designed and created by Knox County Public Works.

Urban and suburban areas pollute the most, of course, but septic tanks and rural Knox County’s agricultural nature can also contribute to the problem.

Outreach programs

Knox County is practically deluged with stormwater management projects. Some are the private-public partnerships already mentioned, while others fall into the category of mitigation education. These are ambitious programs that promote waterways by giving residents a chance to get their hands wet.

The office’s educational outreach sometimes partners with the Knox area Water Quality Forum,

WORKING TOGETHER

The approximately 470,000 residents of Knox County, Tennessee, seem well-served by the Knox County Stormwater Management office staff — all seven of them. That ratio might seem overwhelming. The truth is that working relationships with other parts of county government make it possible.

The management office is in the Engineering and Public Works Department, which also includes the Highway Maintenance Division. “We have a great working relationship with the highway division,” says Natalie Landry, stormwater compliance manager. “We’re on the same campus, and we work together on a lot of projects. Say, for instance, if they have a culvert that has been a continual problem, they will call us for some advice.”

The Soil Conservation District also is under Engineering and Public Works. When watershed questions come to the fore, district professionals bring their expertise into play.

The work of the land development department also dovetails with stormwater oversight. Regulating construction runoff and weighing the impact

of new construction on waterways and water quality are top-priority issues for each office. “We communicate every day,” says Steve Elliott, who heads development services.

Knox County doesn’t operate its own water and sewer systems, so Stormwater Management personnel must work with a “whole mishmash” of communities and utility companies, according to Landry. She says they have established a rapport with one another. “For the most part, we have a pretty good relationship with them.”

She cites the example of one utility with a lab that analyzes Stormwater Management’s water samples for free. The stormwater team, in turn, provides training for agencies and communities on how to deftly deal with broken lines so that water sources are not threatened.

And then there are the innumerable supporting community institutions and groups with whom the office constantly interacts, including Knoxville’s flagship campus of the University of Tennessee, Knoxville. The breadth of public support enjoyed is indicated by donations for one of the department’s mural projects. They ranged from \$20 (District 6 Democrats) to \$500 (Water Quality Forum) to \$1,500 (Beaver Creek Kayak Club).



Diligent monitoring

As the Clean Water Act has evolved over the years, it has come to place greater emphasis on natural drainage options and less on concrete solutions. There is still plenty of the latter in Knox County — 2,245 culverts, for example — but the comprehensive approach pays more attention to water quality. State and local regulations buttress it.

In addition, Knox County participates in the National Flood Insurance Program. In exchange for ordinances that restrict new construction in flood plains, subsidized flood insurance is made available to local homeowners. More regulations, but more protection — the trade-off means more

work for the Stormwater Management team.

The county enhances the insurance angle by voluntarily having its flood management policies rated by the Federal Emergency Management Agency. Good ratings lower the flood insurance premiums. If stormwater people stay ahead of the rapid development occurring in some of the watersheds, it all works out. “We’re diligent about monitoring it,” Landry says.

“We’re experiencing fast growth in some areas, but we have a robust stormwater program and a professional inspection program. I feel pretty good about things.” ♦

a consortium of communities, businesses, utilities and nonprofit groups. Programs include Kids in the Creek and Families in the Creek. The former outing is an all-day activity held near a school. It was inaugurated with one school in the system but has been expanded to middle and elementary school children on several campuses.

In each case, up to 30 students rotate through four stations, assisted by AmeriCorps personnel. They capture and identify types of fish, collect and sort creek-bottom insects, perform chemistry examinations such as pH tests and, in general, evaluate the environmental condition of a waterway.

Stormwater staff members also partner with University of Tennessee, Knoxville professionals to sponsor Tennessee Smart Yards workshops in which experts teach nine principles of sustainable yard creation and maintenance.

The county’s Adopt-A-Stream program was one of the first in eastern Tennessee. Adopting organizations are asked to wade the water or walk the banks of a waterway twice a year to clear away debris. The county has 55 named streams. So far, eight of them are adopted.

And then there are murals. The first one was created three years ago along the Ten Mile Creek Greenway. The greenway passes through a pedestrian tunnel beneath a roadway. At the west exit to the tunnel, a colorful mural adorns wings of the tunnel’s concrete infrastructure. Depicted are the fish, fowl and flora found along the creek. The work was commissioned by the Stormwater Management office and painted by a local artist. “It’s pretty special,” Landry says.

A second mural, this time a mosaic tile creation, was created at a senior center near the county’s Sportspark. It depicts a healthy headwaters ecosystem. Residents helped create tiles in a series of workshops and then were invited to help install them. A grant and private donations funded it.



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A NEW APPROACH TO WORK

Empower employees and give them autonomy to actively solve problems

By Ken Wysocky

Entrepreneurs are generally viewed as innovators, problem-solvers and groundbreakers, imbued with a passion and drive that many employees — buried under emails, memos, meetings and bureaucracy — can only dream of achieving.

But what if entrepreneurship was a possibility and you could go about your job with the vigor and enthusiasm of someone running their own startup business? Or if you're a manager, what if you could motivate your team to act like mini entrepreneurs?

Well, you can — and you should, advises Bree Langemo, the director of entrepreneurship and an assistant professor of law and entrepreneurship at Concordia College in Moorhead, Minnesota.

Employees with an entrepreneurial mindset disdain the narrow parameters of their job descriptions. Instead of waiting for a manager or supervisor to tell them what to do and how to do it, they're always on the lookout for opportunities to improve and contribute to their organizations, she says.

"Being entrepreneurial isn't about starting a business," explains Langemo, the former president of the Entrepreneurial Learning Initiative, a global consulting firm that provides entrepreneurial training and education for organizations. "It's more of a

way of thinking and acting. Entrepreneurial people find ways to create value, whether they're working in an organization or in government or academia.

"Being entrepreneurial isn't about starting a business."

Bree Langemo

"The core belief behind the entrepreneurial mindset is that it's the employee's responsibility to align their interests, skills and abilities to solve problems for other people in order to create value. That could be colleagues, customers or other stakeholders in an organization."

The bottom line: Entrepreneurial-minded employees look at the big picture and don't accept the status quo. They fight against the mind-numbing notion that things are always done a certain way simply because that's the way they've always been done, she says.

Freedom to innovate

As an example, Langemo cites Rob Vigil, an employee in the Albuquerque, New Mexico, solid-waste department, who started thinking about his job differently after getting coached by the Entrepreneurial Learning Initiative. Instead of concentrating on his described job duties, he decided to take ownership of his job and start running his department like it was his own small business, Langemo says.

Empowered by his new mindset, Vigil redesigned the department's trash and recycling pickup



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.

“As humans, we want to feel useful and leverage and stretch our skills and talents.”

Bree Langemo

program, a move that saved the city a significant amount of money annually. He also got promoted.

More than 500 Albuquerque city employees from 22 different departments received the same training as Vigil did. As a result, they no longer wait for permission to solve the problems they encounter on the front lines of their jobs.

Of course, that underscores an essential part of fostering an entrepreneurial mindset: Managers within organizations must create a culture that empowers employees and gives them the autonomy to actively solve problems within their roles. So if employees come to managers with workplace complaints, managers should encourage them to find solutions.

Moreover, Langemo says public agencies such as water and sewer utilities — which have a reputation for being staid and static places to work — are actually a good place to practice entrepreneurialism.

“Public employees tend to be more connected to their agency’s mission than private employees, so there’s a great opportunity to leverage that connection and passion. They’re public servants who care about the end results of their contributions to society.”

Reduce turnover

Langemo points out that entrepreneurial-minded employees don’t have to always hit a home run when it comes to developing product innovations or better processes and procedures. Instead, being an entrepreneur “happens in small ways all the time, whenever an employee recognizes an opportunity to improve,” she explains.

It could be something as small as noticing that the forms used in a human resources process are duplicative and it would be much more efficient to fill them out digitally and eliminate redundancies, Langemo says.

Moreover, giving employees the freedom to act like entrepreneurs increases engagement and reduces the tendency to feel confined and helpless in their roles. As such, it can reduce turnover, too, she says.

“Organizations that don’t encourage an entrepreneurial mindset won’t attract top talent or land entrepreneurial employees,” she points out. “If they have to navigate around an organization that doesn’t allow them to excel, they’ll leave.”

This is especially true for millennials, who desire job autonomy, are values-driven and want to feel connected to larger causes.

Easy to learn

This may all sound a bit intimidating, but it’s not. In fact, most people naturally gravitate toward and would prefer to work as entrepreneurs, Langemo says.

“As humans, we want to feel useful and leverage and stretch our skills and talents. And if organizations don’t capitalize on that, their employees become dis-

engaged and complacent ... and the organization loses out on what it could potentially become.

“Most people welcome entrepreneurship. It’s quite personal to them. And it’s not hard to learn. ... It’s just a matter of opening a door to a new way of thinking that inspires and engages people. Initially, it requires self-awareness and understanding. And the next step is for employees to apply it and take action.”

And start minding their own businesses, in a manner of speaking. ♦

Resources for organizations interested in developing employees with entrepreneurial mindsets include the Entrepreneurial Performance Labs at www.eplabs.co and the Entrepreneurial Learning Initiative at www.elimindset.com.



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BREATHING EASY AGAIN

El Paso Water puts a stop to lingering odor issues with a super oxygenation system

By Kyle Rogers

El Paso Water lead service worker Robert Almanza moves traffic control cones while gravel is brought in to backfill a trench at the site of a water main repair. (Photography by Brian Kanof)



PROFILE:
El Paso Water

FOUNDED:
1952

AREA SERVED:
The city of El Paso, Texas, and some outlying areas

POPULATION SERVED:
About 800,000

SEWER INFRASTRUCTURE:
4 wastewater treatment plants, 75 lift stations, 2,300 miles of collections lines

STAFF:
900

ANNUAL OPERATIONS BUDGET:
\$119 million covering water, wastewater and stormwater utilities

WEBSITE:
www.epwater.org

For years, El Paso Water in Texas struggled with odor control at its John T. Hickerson Water Reclamation Facility. The plant's location in a low-lying area alongside a busy interstate and near residences and businesses meant increased scrutiny for that odor, and complaints were common.

But after installing a super oxygenation system at the primary lift station that feeds the plant, those odor complaints have been eliminated for the most part.

"About the only time we get odor complaints now is when there's some sort of an equipment malfunction — a pump goes out on the super oxygenation system or the odor control tower at the plant is under maintenance," says David Ornelas, El Paso Water's wastewater systems division manager, who has been with the utility for 21 years. "Our normal operation now is without any odor complaints. They used to come in pretty consistently, even from people just driving by the plant."

Since the super oxygenation system went online in January 2015, El Paso Water has become one of the top case studies for the technology's benefits because of how well it has worked for the utility. El Paso Water most recently showcased it at the Water Environment Federation's Collections System Digital Conference in June, where it did a virtual tour of the Hickerson plant and the nearby lift station that contains the super oxygenation system.

“About the only time we get odor complaints now is when there’s some sort of an equipment malfunction.”

David Ornelas



“This technology has been a really good match,” Ornelas says.

Searching for a solution

El Paso Water serves a population of about 800,000, encompassing the city of El Paso and several surrounding areas. On the wastewater side, that involves operating and maintaining 2,300 miles of sewer lines, 75 lift stations and four treatment plants.

But in 2012, the utility focused some extra attention on the Hickerson plant. “We decided we needed to do an in-depth odor assessment of the plant, so we hired an engineering firm and started looking at possible solutions,” Ornelas says.

The Hickerson plant does not have any primary clarifiers. Wastewater goes straight into the aeration basins after going through the screening process. Ornelas says odor issues were focused around the headworks and the plant’s dewatering building. The utility hired JACOBS to begin looking at options for both vapor phase treatment and liquid phase treatment.

“For liquid phase treatment, they were looking at going upstream to a lift station that pumps about 90% of the wastewater that goes into the plant,” Ornelas says.

The Frontera Lift Station sits about 3 1/2 miles upstream of the Hickerson plant, pumping a significant majority of the plant’s 11 mgd flow through dual force mains that get as large as 42 inches in diameter by the time they reach the plant. JACOBS discovered high levels of sulfides in the wastewater at the lift station.

“We had a small oxygen system at the lift station at that time,” Ornelas says. “We injected



Crew members Marco Munoz, Pascual Rodriguez and Albert Leon (from left) prepare to replace a broken water main valve.



SHOWCASING NEW TECHNOLOGY

El Paso Water in Texas has been a prime showcase for the super oxygenation technology since installing it in 2015 at the utility's Frontera Lift Station. At the time, there were only a handful of utilities across the U.S. using it.

Since then, El Paso Water has done papers about it for conferences, and the designer of the system, ECO Oxygen Technologies, has regularly used the utility as one of its top case studies. That exposure has drawn interest in the technology.

"We get phone calls from other utilities every now and then," says David Ornelas, El Paso Water's wastewater systems division manager. "There's interest out there."

Most recently, El Paso Water showcased its super oxygenation system at the Water Environment Federation's Collections System Digital Conference in June. The conference had initially been set to be held in El Paso, and Ornelas and his team were going to be conducting a tour of the John T. Hickerson Water Reclamation Facility and the Frontera Lift Station, where the super oxygenation system is installed. When the COVID-19 pandemic forced the conference to shift to a virtual format, El Paso Water still maintained its plans of providing a tour.

"We put a video together, and I did narration out in the field," Ornelas says. "It went well. We weren't able to do it in person, but at least the tour was still able to be part of the conference in a way."



Utility pipe layers Pascual Rodriguez (left) and Albert Leon set up a MultiQuip pump to dewater a trench.

"Replacing those force mains would be a high capital cost, so anything we can do to maintain and reduce corrosion is significant."

David Ornelas

oxygen using a plain, simple diffuser system. But that wasn't doing much due to the high levels of dissolved sulfides."

While JACOBS looked at possible options for liquid phase treatment at the lift station, Ornelas and his team also did some research.

"We discovered this super oxygenation system. We saw some case studies in California and other areas, but we had never seen it around here," Ornelas says.

El Paso Water asked JACOBS to look into it. The designer of the system, Indianapolis-based ECO Oxygen Technologies, considered El Paso's particular factors — sulfide levels, pipe length and detention time — and confirmed that its ECO2 SuperOxygenation System would be a good fit.

"It had the lowest life-cycle costs of all the liquid phase treatment options that were out there," Ornelas says.

How it works

The ECO2 system works by pumping a side-stream of the wastewater entering the lift station into its Speece Cone — a conical-shaped oxygen transfer device. Oxygen is metered into the cone and completely dissolved due to the large gas/wastewater interface generated by the bubble swarm inside the cone. The oxygenated wastewater is then blended back into the lift station's flow discharge.

"The technology relies on adding a sufficient amount of oxygen to overcome the amount of dissolved sulfides and other compounds that consume oxygen in the wastewater," Ornelas says.

"So based on the amount of dissolved sulfides in the wastewater and the amount of flow at the lift station, they were able to size a super oxygenation system that was appropriate. You have this degradation of the dissolved oxygen in the force main as it goes to the plant, but they were able to size it so that we would maintain at least 0.5 mg/L of dissolved oxygen when the flow reached the plant."

Out of the roughly 10 mgd coming through the Frontera Lift Station, only 4,500 gpm is diverted into the sidestream that goes into the super oxygenation system. But the level of oxygen saturation that occurs in the system's Speece Cone is so high that it greatly reduces the sulfide levels in the wastewater traveling from the lift station to the Hickerson plant. And since the lift station represents nearly all of the flow that the plant receives on a daily basis, it reduces the odor that El Paso Water had been aiming to address.

"That Speece Cone has a high transfer of the oxygen into the wastewater, which is what we weren't able to do before with the regular diffusing system," Ornelas says. "The transfer efficiency of the oxygen is so great that you're able to add significant amounts of dissolved oxygen and maintain it in the force main all the way to the plant."

In addition to getting the odor under control, another benefit has been the reduction in corrosion in the 3 1/2 miles of force main between the Frontera Lift Station and Hickerson plant.

"The corrosion reduction is important," Ornelas says. "Replacing those force mains would be a high capital cost, so anything we can do to maintain and reduce corrosion is significant."

(continued)



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SRRK-1 Super Green Meanie Green Kit

The round profile allows the cutter to enter sewer lines 4" and up. Motor handles flows from 40 - 80 GPM and pressures 2000 - 3000 PSI. Rated up to 235 ftlb. of torque, and 175 ftlb. of continuous torque. Kit comes with SRRK-1P Super Green Motor; 1" Saw Blade Hub; 6", 8", 10", 12" HD Concave Saw Blade; 6", 8" Cage Skid Single Size; Set Of 10" & 12" Fins. Motor fits Green wheeled skids you may have.



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Large Range Kit gives you saws and skids for 4" to 15" pipe sizes. Cutter handles flows 40 - 80 GPM and pressures 2000 - 3000 PSI. Rated up to maximum 235 ftlb. of torque, and 175 ftlb. of continuous torque. Kit comes with SRRK-1P Super Green Motor; 1" Saw Blade Hub; 4", 6", 8", 10", 12", 15" HD Concave Saw Blade; Set of 4" Steel Rings; 6" Cage Skid; 8"-10" Adjustable Wheel Skid; 12"-15" Adjustable Wheel Skid; Allen Wrench and Screws



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“It was definitely a team effort.”

David Ornelas

A cost-effective fix

In total, the project cost El Paso Water nearly \$1.1 million, split almost evenly between ECO Oxygen Technologies for the equipment and a contractor for the installation.

Installation went well, Ornelas says, but the logistics of it were challenging enough that it was imperative to have a good contractor. The Speece Cone sits 24 feet above the force mains, so piping had to be routed to ground level and then back to the force mains. And the lift station had to remain fully operational during installation, so the hot tapping that was required presented another challenge. El Paso Water was able to take advantage of the oxygen system that had already been on site.

“We have a vendor who supplies everything — the tank, the evaporators — so we used the system that was already there and just had to run the oxygen line to the Speece Cone,” Ornelas says.

The investment in the super oxygenation system has been well worth it, Ornelas says. Prior to its installation, the Hickerson plant relied on vapor phase treatment for odor control, using chemical scrubbers at the headworks and the dewatering building. The super oxygenation system has reduced the amount of chemicals needed for those scrubbers. And it has meant that the utility hasn’t had to worry about constructing additional air treatment systems at the plant, which was really the only other avenue left for improving odor control.

“Fortunately, this super oxygenation option was there, and it’s worked out well,” he says. “Not only did it reduce odors at the plant, but it also reduces odor and corrosion along the route of the force mains. The cost of installing the system is much better compared to the cost of having to replace force mains or install more air treatment systems at the plant.

“It was definitely a team effort,” he adds of the project, citing other valuable members of the utility like Aide Fuentes, wastewater treatment manager, who served as project manager during the system’s installation.

Assessing other sites

The successful application at the Hickerson plant has El Paso Water looking at other areas of its system that could benefit from the super oxygenation technology.

The one that sticks out at the moment, Ornelas says, is the Fred Hervey Water Reclamation Plant because of its similarities to the Hickerson plant. It too receives a significant amount of its flow from a single lift station, but unlike the Hickerson



Utility pipe layer Mark Herrera works on the replacement of a broken water main valve.

plant, it is in a more remote location so odor complaints have not been a chronic issue.

“It’s not as big of an issue as the Hickerson plant, but we’re looking at it both for odor control and corrosion control,” Ornelas says. “That’s the other major benefit of this is the corrosion control, so we’re looking at other super oxygenation systems to see if they’re a good fit.” ♦

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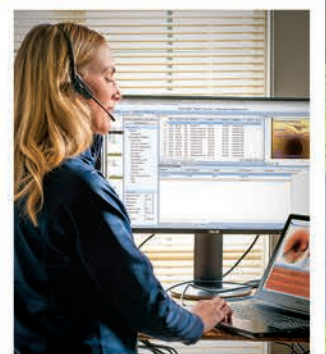
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Editor's note: We're digging through the archives and sharing our most popular stories from the past 10 years. This online exclusive was originally posted in August 2014 and was written by Ed Wodalski, who has since passed away. Ed was a good journalist and a good person, and he helped me a great deal in my early years at COLE Publishing. It's only fitting that his stories still rank highly on MSWmag.com.

TECH TALK

THE SEWER BATTLE: GRAVITY VS. PRESSURIZED

Gravity and low-pressure sewer systems both have benefits, but apples to apples, low-pressure systems cost less to install

By Ed Wodalski

Long before the apple first fell on Sir Isaac Newton's head, waste was flowing downhill. In many cases it still does. But as populations branched out to lower elevations, gravity no longer could do the job, and lift stations were needed to restore flow.

Today, not all waste flows downhill. The law of gravity hasn't reversed, but technology — specifically low-pressure sewer systems — enable municipal waste to go where no waste has gone before: over undulating bedrock, through wetlands and across vast rural

regions. It does this by using a grinder pump that turns solids into slurry that can be piped without regard for slope or groundwater depth.

Pressure sewer systems are also less invasive and less expensive to install.

Maintenance is minimal, with electricity to power the pump being the primary cost. So why would a municipality install a gravity sewer system rather than a pressure system?

"Comfort," says Kenneth Ligman, senior project manager for Becher Hoppe engineers and architects in Wausau, Wisconsin.

"Most people are accustomed to a gravity system. For the homeowner with a gravity system, there's really nothing for them to do, unless they're dumping grease down the sewer and clogging their pipes. With a grinder pump station, in five to 10 years there will be maintenance required on the cutters."

Comparing apples to apples, Ligman says a low-pressure sewer system is less costly than a gravity sewer system.

"Gravity sewers need to be cleaned; they need to be flushed," he says. "On a pressure sewer system, the pipe is always full of water. It's counting on a number of pumps operating at the same time to get enough velocity to scour whatever might be settling in that pipe."

There are also hybrids that use both gravity and pressure. So which system is best for you?

"Where it gets extremely expensive is when sewers get about 20 feet deep."

Kenneth Ligman



“You need people to pay for the pipe. In rural areas, it costs you more per foot for the pipe and restoration.”

Kenneth Ligman

“The beauty of the pressure sewer system is the main in the street only needs to be deep enough to prevent frost impact, typically 7 1/2 feet,” Ligman says.

“If we’re along a river or lake, you would have to dewater your trench, so you’re looking at more dollars. If we’re up in the hills where we have shallow bedrock, you need to blast the rock out. That adds another layer of cost to the gravity sewer system,” he says. “Pressure sewer systems are typically above most groundwater and bedrock situations. So you avoid that cost.”

Gravity sewer systems have a reputation for leaks and root growth, especially older infrastructure. With pressure systems, the HDPE pipe is fused, minimizing the potential for leaks and infiltration.

Electrical demands

Other than the lift stations, Mother Nature powers gravity sewer systems. Low-pressure grinder pump systems require a pump station at each residence or business; waste flows through a 1 1/4-inch lateral to a 2- to 6-inch-diameter main. Electrical costs for the pump stations are about \$12 per year, typically paid by the consumer, although some municipalities choose to own and maintain the pumps.

“If there is a downside to a pressure system, it’s that it has a pump, and pumps use electricity,” Ligman says. “It’s not a lot of electricity but it is a pump, and pumps have parts that wear out and need to be replaced.”

Installation costs

Gravity sewer systems — pipe, manholes and laterals — cost about \$50 to \$60 per foot to install, he says. Gravity sewers also use opencut excavation, disrupting streets and landscape. Restoring a bituminous street can cost \$40 to \$50 a foot, Ligman says. Those costs combined, gravity sewers cost about \$100 a foot for a city setting.

Pressure sewer systems use high-density polyethylene pipe, which can be directionally bored, resulting in lower restoration costs. Ligman says grinder pump stations cost about \$10,000 to install and pipe about \$20 a foot. Together, the cost of installing a pressure system is about \$80 to \$90 a foot.

Soil depths

“Gravity sewers are typically 10 to 12 feet deep so we can provide basement service: floor drains or clothes washers,” he says. “Where it gets extremely expensive is when sewers get about 20 feet deep.”

At this point, lift stations are installed and another, shallower sewer is started.

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While most utilities are accustomed to gravity sewer systems, pressurized systems are less invasive and less expensive to install. They also require less maintenance.



“About the only place it might leak is at the pump station and the service lateral.”

Kenneth Ligman

Population density

Gravity systems are also less cost-efficient on rural, far-spaced lots. “You need people to pay for the pipe,” Ligman says. “In rural areas, it costs you more per foot for the pipe and restoration.”

Inflow and infiltration

Gravity sewer systems have a reputation for leaks and root growth, especially older infrastructure.

“Gravity sewer pipes are typically 13 feet long,” Ligman says. “A rubber O-ring gasket seals the pipe. When installed, the pipes are pressure-tested to show there isn’t leakage, but over time things happen: Ground shifts, there’s traffic impact, and sewers can settle and crack.”

With pressure systems, the HDPE pipe is fused.

“You end up with what I call one long noodle,” he says. “There’s a lower chance of leakage into the system. About the only place it might leak is at the pump station and the service lateral.”

Making the call

“Normally you would compare the costs of both systems in what we call a total present worth evaluation, where you take into consideration the energy cost of each home and the cost of replacing the pumps on a 7- to 10-year basis and you look at that over 20 years,” Ligman says. “If it’s an area where the road needs to be upgraded anyhow, it’s not really a cost assigned to the sewer since that’s part of your normal road maintenance program. So that would weigh in my evaluation of which type of system to install.” ♦

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NEW TECHNOLOGY SLATED FOR WEFTEC CONNECT

By Craig Mandli

WEFTEC, the Water Environment Federation's annual Technical Exhibition and Conference, offers municipal and industrial water and wastewater professionals from around the world exposure to the newest products, as well as opportunities for professional development. This year's virtual event,

WEFTEC Connect, will be live Oct. 5-9 and features an exhibitor showcase, education and networking components of the WEFTEC experience. Below is a preview of some of the latest offerings from exhibitors who would have displayed them in person, as well as products that will be highlighted at the 2020 virtual event.

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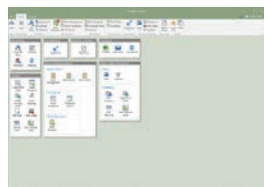
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Alfa Laval's Aldec G3 VecFlow decanter centrifuge offers high performance and low operating cost. The unique feed zone minimizes turbulence, resulting in exceptional separation and 30% lower power consumption versus traditional decanters. It also offers the flexibility to optimize the process by minimizing polymer consumption, increasing cake dryness or boosting capacity, all based on your unique conditions. Plants can often realize a full return on their investment in less than a year due to its high separation performance and low power consumption. Meet Alfa Laval at WEFTEC Connect to discuss if VecFlow is the right solution for your dewatering and thickening process. **866-253-2528; www.alfalaval.us.**

WEFTEC Connect Virtual Exhibitor

AllMax Software Antero CMMS version 7



Antero CMMS version 7 from **AllMax Software** includes asset mapping, asset criticality scoring, improved work flow and work order management, and procedure scheduling for detailed plant inspections and rounds. Improvements have been made to the reporting, calendar and equipment sections, ensuring users have access to their most critical asset and maintenance information in order to make informed, data driven decisions. It accurately tracks maintenance data, allowing the user to streamline their maintenance program to save time, effort and money, all while providing

the peace of mind that the equipment is being maintained efficiently and effectively. **800-670-1867; www.allmaxsoftware.com.**

WEFTEC Connect Virtual Exhibitor

Applied Felts CIPP liners



Using only the highest quality raw materials available, **Applied Felts** manufactures world-class CIPP liners based on unique job requirements. Their vertically integrated offering of classic felt liners include flame-bonded, or sewn-seamed, highly durable PU and PP coated liners for more extreme environmental and installation requirements. They also provide maximum flexibility in the field. The fiberglass-reinforced liners provide a strong, robust liner for gravity sewer, pressure pipe and potable water applications. **276/656-1904; www.appliedfelts.com.**

Aqua-Aerobic Systems OxyStar



The **OxyStar** aerator from **Aqua-Aerobic Systems** has been a leading aspirating aeration technology for over 50 years, and has effectively aerated and mixed over 4,000 municipal and industrial wastewater treatment systems across the globe to introduce oxygen into lagoons, equalization basins, aerobic digesters, sludge holding basins, and/or activated sludge systems. Known for its efficient oxygen transfer and intense directional mixing pattern, which results from its three-blade helical propeller, the aspirating aerator is a suitable solution to improve aeration systems in aerated lagoons, oxidation ditches and other activated sludge processes, equalization basins, and aerobic digesters. **815-654-2501; www.oxystaraerator.com.**

WEFTEC Connect Virtual Exhibitor

Atlas Copco ZS

The **ZS** blower range from **Atlas Copco** is designed to guarantee a continuous and long-term supply of oil-free air. The models in the range provide reliable, energy-efficient packages, which are suitable for a wide array of wastewater applications, ensuring low-operating costs and maximizing your total cost of ownership. Maintenance costs and downtime are mini-



mized due to the innovative technology of the screw blower. The range also boasts low noise levels, meaning they can be installed at the point of use. The flow range is 120 to 5,500 cfm, with a pressure range of 0 - 22 psig. **866-546-3588; www.atlascopco.com.**

WEFTEC Connect Virtual Exhibitor

Badger Meter Dynasonics TFX-5000



The **Dynasonics TFX-5000** ultrasonic clamp-on meter from **Badger Meter** uses transit time technology to accurately measure the volumetric flow of clean liquids and those with small amounts of suspended solids. It is suitable for water and wastewater applications, such as lift stations, booster pump stations and water mains. Designed to clamp onto the outside of

pipes, it doesn't contact the internal liquid, allowing for installation without shutting down operations in new and retrofit applications. It is equipped with an internal clock and built-in 8 GB data-logging capabilities to log water flow down to one second. **877-243-1010; www.badgermeter.com.**

BDP Industries 3DP Belt Press



The **3DP Belt Press** from **BDP Industries** is designed to provide high discharge cake solids at high flow rates. It has a 25-year track record of low operation and maintenance costs while providing suitable performance. It has been continually improved with the latest features and automation, and is a rugged, durable machine

designed to provide years of reliable service. With its history of dewatering aggregates and minerals, as well as wastewater treatment plant solids, it is also especially suited for water treatment plant residual dewatering. **518-695-6851; www.bdpindustries.com.**

WEFTEC Connect Virtual Exhibitor

Brown Bear Model R-31-10



Model R31-10 compost aerator attachments for skid and compact track loaders from **Brown Bear** mix and aerate compost windrows of organic yard waste, green waste, food waste, dry wastewater and potable water biosolids quickly and efficiently. They are quick attachable with

a quick coupler system, and the rotor is powered by the implement's high-flow hydraulics. The 31-inch paddle-type rotor provides a fast mechanical solution for accelerated solar drying of biosolids, forming windrows, blending bulking agents or additives, pulverizing, aeration and water addition for aerobic windrow composting. **641-322-3169; www.brownbearcorp.com.**

Centrisys/CNP THK



The **Centrisys/CNP THK** sludge thickener is engineered for high-performance biosolids thickening. Compared to other centrifugal sludge thickening technologies, it uses 50 percent less power and dramatically reduces or even eliminates the need for polymer conditioning.

Thanks to these savings, it represents a low total cost of ownership. With an all-cylindrical design for maximum capacity, it has a small footprint for its throughput. Air injection for precise control of sludge thickness makes operation easy and reliable. It is an enclosed system,

allowing for safe, hygienic operation and simple cleaning. **262-654-6006; www.centrisys-cnp.com.**

WEFTEC Connect Virtual Exhibitor

Cretex LSS Internal Manhole Chimney Seal



Cretex LSS Internal Manhole Chimney Seal

is a mechanical seal installed on the frame and grade ring sections of sanitary sewer manholes. These seals eliminate and prevent manhole frame-chimney inflow. During wet weather, clear water (inflow) enters manholes through deteriorated and broken frame-chimney joints,

which may burden the collection system. Each seal is made up of a high-grade rubber sleeve and stainless steel expansion bands, which can be easily removed and reinstalled to allow for future manhole adjustments. The chimney seal has a 50-year design life and is available in four widths, allowing complete chimney coverage of up to 24 vertical inches with a single seal. **800-345-3764; www.cretexseals.com.**

WEFTEC Connect Virtual Exhibitor

CUES GraniteNet WebInspect



GraniteNet WebInspect from **CUES** is a browser-

based inspection app designed to perform inspections and collect information about municipal assets, such as manholes, including MACP v7 Level 1, hydrants, lift stations, grease traps, light poles and signage. It can be used to help perform and track tasks such as valve turning, smoke tests, brush cutting and snow

plowing. It allows the tech to collect GPS points, water quality samples, flow tests, and assess sewer backups, as virtually any type of asset assessment or task can be quickly deployed for the organization, with or without existing GIS maps. All that's needed is an internet connection and virtually any device with a browser, such as a mobile phone or a tablet. There's no software to install on any user devices. **800-327-7791; www.cuesinc.com.**

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Duke's Root Control Razorooter II



Razorooter II from **Duke's Root Control** is a

herbicide-laden, thick foam with the consistency of heavy shaving cream that is a cost effective way to kill tree roots in sewers. Duke's crew inserts a hose from manhole to manhole. The hose releases and sprays the foam in all directions, allowing it to adhere to roots and penetrate

through wye connections to kill roots, even in lateral lines. The entire system is treated as the foam compresses against pipe surfaces and penetrates cracks, joints and connecting sewers. Roots are killed on contact inside and outside the pipe walls, decay naturally and slough away, with regrowth delayed for two to three years. Trees and other above ground vegetation are not harmed. **800-447-6687; www.dukes.com.**

Enviro-Care FSM

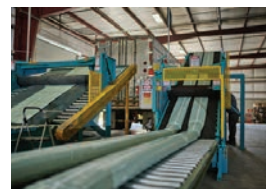


The **FSM** multi-angle, perforated-plate belt filter screen from **Enviro-Care** increases the flow capacity by almost 100% while maintaining the original channel footprint. The first section of the screen sits at a 30-degree angle that doubles the wetted screen area while reducing the velocity through the screen. The screen then transitions into a 75-degree transport area. It can be the solution to upgrading to a high-cap-

ture screen and handling more flow in an existing channel. **815-636-8306; www.enviro-care.com.**

WEFTEC Connect Virtual Exhibitor

FerraTex Solutions Wet-Out Liners



FerraTex Solutions provides CIPP wet-out liners and services for demanding trenchless pipe rehabilitation projects, reducing time and costs for CIPP installers. With six locations across the U.S., they offer logistics advantages and customer service throughout the U.S., Canada and parts of Mexico. Each wet-out liner undergoes a rigorous

ISO-9002 certified quality-assurance inspection. Once resin impregnation is completed, the resin-saturated liner is loaded into a climate-controlled trailer for delivery, and is tracked through GPS. **844-433-7728; www.ferratex.com.**

Flomatic Valves Model 745 AIS



The **Flomatic Valves Model 745 AIS** swing check valve has a valve body with full flow area equal to nominal pipe diameter and a 45-degree angle seat providing short disc travel with faster closure for non-slam performance. An EPDM molded one-piece disc has an integral molded

O-ring on the seating surface, which is reinforced with steel. It is available with accessories such as a backflush device, position indicator and limit switch. It has NPT threaded and plugged side ports for easy installation of gauges or accessories. It is designed and manufactured according to ANSI/AWWA C508 Standard. **800-833-2040; www.flomatic.com.**

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Force Flow Drumm-Scale



The **Drumm-Scale** from **Force Flow** is a simple and reliable way to accurately monitor the amount of polymer fed from a day tank, and it enables accurate compliance with government-required documentation of chemical use. It helps maximize solids yield with minimal polymer use. The low-profile Tuf-

Coat steel platform permits easy on- and off-loading of tanks without the need to pit-mount the scale. The unit is available with any of the company's indicators, including the economical SOLO G2, the advanced multichannel Wizard 4000 and the rugged Century hydraulic dial. **800-893-6723; www.forceflowscales.com.**

Gorman-Rupp Integrinex Advanced



Gorman-Rupp's Integrinex Advanced lift station controls are custom engineered to meet unique system requirements. When equipped with FloSmart technology, the control system can detect a pump obstruction and run a cleaning cycle until the debris clears. Upon detection, the device initiates a cleaning operation without interfering with the operation of the pump station. When

the cycle is complete, the pump is ready to return to normal operation. If the clog remains, the cleaning sequence repeats until the blockage is cleared. FloSmart helps maximize uptime while reducing maintenance costs. **419-755-1011; www.grpumps.com.**

Hach EZ Series Online Analyzers



EZ Series Online Analyzers from **Hach** provide a solution for continuously monitoring parameters that are critical to risk mitigation, compliance, safety and process uptime. They offer five different technologies, including titration, colorimetry, chemiluminescence, ISE and voltammetry. They include a wide analytical range; a variety of measuring ranges, multi-stream capabilities and multiple parameter options; and reliable monitoring of remote locations or unmanned plants, which allows staff to focus on other tasks. **800-227-4224; www.hach.com.**

WEFTEC Connect Virtual Exhibitor

Hayward Flow Control HLS Series Level Sensor



The **HLS Series Level Sensor** from **Hayward Flow Control** provides a broad chemical resistance to acids, bases and oxidizers like sodium hypochlorite with its CPVC body and construction. It is typically placed at the bottom of a liquid

storage tank or sump where the hydrostatic pressure is sensed and converted to an analog output signal (4-20 mA). Pressure level sensors are not affected by liquid surface conditions like waves or foam or tank headspace conditions like vapors or thermal layers. No stilling well is required for accurate measurements. The sensors are provided in two measurement ranges: 0-15 and 0-33 feet of water column. Controllers and indicating transmitters for the unit are also available. **888-429-4635; www.haywardflowcontrol.com.**

Keller America Econoline



The **Econoline** pressure transmitter from **Keller America** combines a media-isolated piezoresistive silicon sensor with signal conditioning electronics to provide a compact pressure transmitter with less than $\pm 1\%$ Total Error Band (TEB) accuracy over 0...50 degrees C. The industry standard 4-20mA analog output is compatible with most existing monitoring infrastructure and SCADA systems and provides meaningful output in ranges from 30...10,000 psi. The design makes it suitable for use under harsh environmental conditions, including those

with high levels of electromagnetic radiation and/or those involving aggressive media where small size, low weight, and reasonable cost are required. Modular production provides short lead times and maximum versatility for customer-specific applications. **877-253-5537; www.kelleramerica.com.**

Lakeside Equipment Raptor FalconRake Bar Screen



Protecting downstream equipment in municipal and industrial applications, the **Raptor FalconRake Bar Screen** from **Lakeside Equipment** achieves high removal efficiency and low headloss, without the need for lower bearings, sprockets, bushings, or guides that could foul or jam conditions in the channel. The all stainless steel, corrosion-resistant construction is designed with multiple rakes that continuously remove captured material. It is available in a range of bar shapes and depths, so that it can create an efficient, durable, and dependable rapid debris removal system for a range of applications. In addition, its design and construction means a low horsepower, energy-efficient drive system. **630-837-5640; www.lakeside-equipment.com.**

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Go to MSWmag.com to view these products.

Lovibond PTV Series



The **Lovibond PTV Series** of process turbidimeters is optimized for drinking water applications. They include a long-lasting LED light source and bubble exclusion system that deliver accurate and ultra-stable measurements. Combined with the heated optical assembly, the chance for condensation and fogging is eliminated. The low volume flow body provides faster response to turbidity spikes and uses far less water and calibration standards. It is easy to clean and can be easily drained with quick-connect fixtures. The instruments meet EPA and ISO regulatory requirements. **941-756-6410; www.lovibond.com.**

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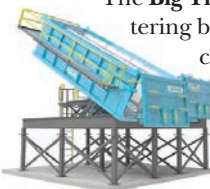
MaxLiner MAX CalTube



MAX CalTubes from **MaxLiner** provide optimum flexibility and durability. The yellow version is engineered from ultra-flexible, lightweight PE fabric with PVC coating that is closed with a high-frequency welded overlap. It is intended for use in open-end liner and pull-in-place applications. They are ideal for lower pressure and heat curing up to 135 degrees

F unsupported. **877-426-5948; www.maxlinerusa.com.**

Park Process Big Tipper



The **Big Tipper** from **Park Process** allows the user to mount dewatering boxes on a permanent stand, and eliminates hauling the containers to the landfill where they can become damaged in transit and when emptying. Having the containers dump into a containment area also allows for extra drying of the filter cake. Using more than one dewatering container allows the units to handle a continuous flow of wastewater. While one container is filling, the other one is sitting idle and draining. Units are available in a multitude of capacities and tipping heights, and come complete with handrails, walkways and stairs and/or ladders. **855-511-7275; www.parkprocess.com.**

Penn Valley Pumps Double Disc Pumps



Double Disc Pumps from **Penn Valley Pump** are based on free disc technology and operate on the principle of induced flow. This positive displacement pump's discs work in unison to perform the duties of both the pumping and valving element, creating a double-acting, non-clogging pumping action suitable for handling sludge, slurry, scum and other waste liquids with up to 2-inch solids. Thanks to a non-close tolerance design, they have less wear for longer operating life and can run dry without damage. When maintenance is required, the maintain-in-place system allows the pump to be serviced without disturbing piping. **215-343-8750; www.pennvalleypump.com.**

Sauereisen SewerGard Roll Applied 210XROL



surfaces, does not require a primer, zero VOCs and prohibits water inflow and infiltration. It is resistant to corrosive conditions common to the munic-

ipal wastewater treatment industry and suitable for application over damp or dry concrete surfaces. Depending of surface temperatures and substrate conditions, it can be applied up to 25 mils per coat. **412-963-0303; www.sauereisen.com.**

Sealing Systems Flex-Seal 2.0



Flex-Seal 2.0 from **Sealing Systems** is an all-purpose single-component sealant that adheres to many surfaces and has over 800% elongation. It is designed to prevent inflow/infiltration and to provide corrosion protection at the grade adjustment ring section or joint section of manholes and catch basins. It is 100% safe and Prop 65 compliant. The internal seal is manually applied using a paintbrush, and the kit is designed to cover 12 vertical inches on a 27-inch-

diameter manhole. **800-478-2054; www.ssisealingsystems.com.**

Vaughan Company Chopper Pumps



Wastewater professionals work hard to keep the water flowing. To do their jobs effectively, they need pumps and equipment made to handle the new sewage reality. When standard non-clog pumps come up short, bring in pumps that make sure that wipes and heavy solids don't cause any harm down the line. By installing a reliable,

heavy-duty chopper pump from **Vaughan Company**, solids are easily handled and broken apart to keep operations running smoothly. **888-249-2467; www.chopperpumps.com.**

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VEGA Americas VEGAPULS C



The **VEGAPULS C** series from **VEGA Americas** is a stand-alone loop-powered sensor with an IP68 housing, fixed cable connection, and complete with NSF/ANSI/CAN 61 approvals. The 80 GHz radar sensors use precision focusing to deliver reliable measurements regardless of internal obstructions, changing temperatures, condensation or dust. These sensors can easily be adjusted

via Bluetooth with a smartphone or tablet, making setup and diagnostics significantly easier. **800-367-5383; www.vega.com.**

YSI, a Xylem brand 3017M Chlorine Analyzer



The **3017M Chlorine Analyzer** from **YSI, a Xylem brand** is a DPD colorimetric analyzer used for continuous measurements of free or total chlorine in municipal drinking water and wastewater samples. It uses an EPA-approved method that makes it suitable for drinking water permit reporting in the U.S. It is accurate, simple, and low maintenance, with features like flow injection analysis, factory calibration and simplified tubing. Low reagent use reduces maintenance frequency. It can operate as a standalone unit or be integrated into the IQ SensorNet system of online controllers, analyzers and sensors for better visibility and process control. **937-767-7241; www.ysi.com. ♦**



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GROWING WITH THE INDUSTRY

Two generations and 25 years of work have CCI Piping Systems poised for a bright future

By Luke Laggis



There are infrastructure improvements on every utility's to-do list. And most battle inflow and infiltration. Finding the right solutions is critical.

That's where CCI Piping Systems comes in. The family business manufactures pipe supports and spacers, among other products, but its WrapidSeal Manhole Encapsulation System is of particular interest to utility operators and managers dealing with I&I issues.

“We continue to grow and stay ahead of the curve with innovative products solving everyday issues in our industry.”

Claire Morley



Municipal Sewer & Water recently had the opportunity to speak with Claire Morley, sales and marketing manager for CCI and daughter of company founder Gene Cazayoux, about the company's history and the products that are moving it forward.

MSW: Can we start with an overview of the company and a little history?

Morley: In 1984, Gene Cazayoux learned about corrosion on pipes caused by bare U-bolts rubbing away at the pipe's protective coating and he came up with the idea for the coated U-bolt to prevent this from happening. At the time, he was also the distributor for Canusa products throughout the Gulf states. In 1995, he decided to go into business for himself and opened CCI Piping Systems.

Catering primarily to the oil and gas industry, CCI's focus was on selling ArmorCote original coated U-bolts. CCI then entered the wastewater industry after finding a solution — the WrapidSeal Manhole Encapsulation System — to the problems caused by I&I entering manhole systems. Continuing with steady growth, by 2004 CCI had a second plant and was manufacturing products for the

water industry including casing spacers, end seals and Wrap-It Link wall penetration seals.

In 2006, I came on board to handle the marketing for the company and eventually worked my way into sales, as well. My brother Paul joined the business in 2017 after working for an engineering

firm and earning his professional engineering license. He has taken on the role of technical sales and engineering, handling lunch and learns, specification work, demos, new product development, etc. We continue to grow and stay ahead of the curve with innovative products solving everyday issues in our industry.

MSW: Congratulations on the company's 25th anniversary. What's been the key to longevity in this industry?

Morley: The key to CCI's success has been hiring the best employees the industry has to offer. We are fortunate to have quality employees who take pride in doing a great job.

It is rare for CCI to be in need of a new employee, as most of our staff has been with us for more than 15 years. But as we grow, we have sought additional staff members to help carry the added workload. When doing so, we look for people who are ambitious, hardworking and seeking long-term careers. We also make a point in finding employees who are compatible with our existing staff, as that is mutually important. Lastly, we feel that if we take care of our employees, they'll take pride in doing a good job for us.

MSW: CCI is now a second-generation family business. How does that shape your operations?

Morley: My brother Paul and myself will be stepping in to run the company as our dad moves into retirement. We are eager to carry on our father's legacy and continue to grow his business by manufacturing more products to solve issues in our industry while providing customer service that is second to none.

Working with your sibling looks different in some ways, but quite typical in others. We have different personalities and strengths,

The WrapidSeal, one of CCI's top-selling products, uses a heat-shrinking process to permanently seal manhole structures.



“Being part of a family business means you never really clock out.”

Claire Morley

so we balance one another out well. A lot of our shop talk is casual, and it can occur anytime and anywhere. Being part of a family business means you never really clock out.

MSW: What types of needs do you address for municipal utilities?

Morley: Our WrapidSeal Manhole Encapsulation System prevents I&I from entering structures. Our casing spacers are designed to keep carrier pipes centered and restrained while being pushed under roadways. We also manufacture Wrap-It Link wall penetration seals, which provide watertight seals to annular spaces created when a pipe is going through a wall.

MSW: How has your niche in the industry evolved, and how have you evolved with it?

Morley: CCI actually started as a company focused on the oil and gas industry. While distributing for a company who manufactured shrink sleeves, Cazayoux had the idea to use this technology on manholes. From there, WrapidSeal was formed and has gone on to be approved by major cities all over the country. We have also created the new Omniroller casing spacer that will help solve rifling issues while also reducing the coefficient of friction between the runner and casing.

MSW: What is your top-selling product line?

Morley: Our casing spacers are our top-selling product, with WrapidSeal following closely behind.

MSW: How does this technology help municipal wastewater system operators run their systems more efficiently?

Morley: I&I can be a devastating problem for municipalities. Not only does it back up the sewer system, potentially causing overflows, it has damaging effects on the infrastructure. WrapidSeal provides a watertight seal that will protect your structures for the life of the system.

MSW: Are the animations on your website indicative of the need to educate water and wastewater professionals about all the new technology and solutions that are available?

Morley: Yes, the intention of the animations is to inform our viewers of the technology that is available to solve the issues they are facing and to show them how easy they are to install. There are a lot of options out there for municipalities to choose from to prevent I&I from entering their system, but unlike other potential solutions, WrapidSeal is a positive seal, easy to install and, once applied, is on for the life of the structure.



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THE SUPPLY SIDE

“WrapidSeal provides a watertight seal that will protect your structures for the life of the system.”

Claire Morley

MSW: Could the average municipal utility install CCI's products with an in-house crew?

Morley: Yes, we have a rep network set up throughout North America that's ready to train crews on installing our products.

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

Morley: We work with distributors such as Core & Main, HD Supply, Ferguson Waterworks and LB Supply.

MSW: What's on the horizon for CCI? Are new product lines in development?

Morley: We are always looking ahead with new products in mind. Less than two years after launching our line of pipe supports, we are proud to announce we have another new product coming out: the Omniroller multi-directional casing spacer. The Omniroller is designed to keep the carrier pipe centered and restrained as it's pushed through the casing pipe, make installation easier by reducing the coefficient of friction, and eliminate the spiraling effect typical of standard runners or unidirectional rollers. ♦

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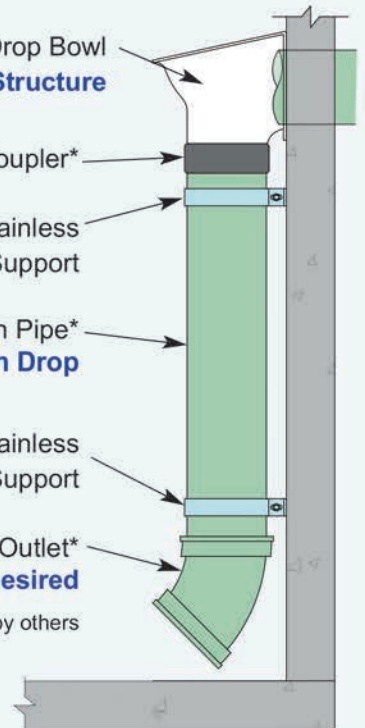
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To significantly reduce unplanned downtime, use the CUES REDI Kit! This handy diagnostic kit includes tools that are indispensable at remote sites for electrical issues, troubleshooting, and repair. Use the REDI kit, along with your CUES technical staff, and take troubleshooting and support to the next level! Get up and running quickly and **GO THE DISTANCE** with the CUES REDI Kit!



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Product Spotlight

Manhole scanner designed with portability in mind

By Craig Mandli

Manhole inspections can often be tricky tasks. Pole cameras and other manual camera systems that allow the inspection crew to stay outside the manhole can be unwieldy and difficult to use. Of course, physical inspection presents its own set of inherent dangers and hassles with confined-space entry.

However, new technology has allowed technicians to get a detailed view of a manhole without the drawbacks. The PANORAMO SI 4K from RapidView IBAK North America uses two high-resolution digital cameras with 185-degree fisheye lenses. These are installed on the topside and underside of the cameras and take hemispherical photos at 2-inch intervals. The photos are put together to form spherical images, thus enabling creation of a true 3D interior view of the manhole. With the image files generated in this way, the perspective from which you view an event or a defect is freely selectable, and a virtual manhole inspection and the measurement of defects are also possible in the office.

"Not only is this safer, but it also allows a crew to inspect more manholes in a day," says Matt Sutton, vice president of sales and marketing for RapidView IBAK North America.

The xenon flash lighting permits pin-sharp images to be generated



in spite of the high scanning speed. The result is an image that is much more brilliant still with 4K resolution on the 360-degree photos. This means that the resolution is four times as high as full high definition. To achieve such brilliance and to allow this high resolution to be displayed on the monitor and stored, the transmission path has been revolutionized.

A newly designed small cable reel with 39 feet of camera cable can be installed in the vehicle or taken out of the vehicle and used in battery operation with an associated portable rack device. This enables inspection of even hard-to-access manholes.

"The technology to scan manholes in this method has been on the market for a while, but the devices have been heavy and cumbersome, needing to be installed in a truck," Sutton says. "Our customers asked for the unit to be lighter, more compact and easier to move around. So the tech is the same as our larger manhole scanners, but we've made the PANORAMO SI 4K a truly portable system." **800-656-4225; www.rapidview.com.**

OTEK Universal Panel Meter Series

The Universal Panel Meter Series from OTEK has an alphanumeric tri-color display that includes counter algorithms so the UPM Series can function equally efficient as a counter or a digital panel meter. The UPM-L model includes a keypad so it can serve as a counter with functions including time, event, frequency, ratio, up/down, TTL/COMS and HV. As a DPM, it readily accepts more than 30 standard analog signals, including but not limited to 100% 4-20mA loop power from millivolt to 240-volt AC/DC and 0.1, RTD, TC, S-G and many others. Additional highlights of the model feature input fail alarms with runtime stamp, self-diagnostics, isolated serial input/output (USB or RS485), intensity controls, four relays or isolated transistors, math functions, only 100mW at 5-volt DC and Ethernet/Modbus upon request. **520-748-7900; www.otekcorp.com.**



Sewer Equipment Model 900 ECO combo truck

The Model 900 ECO combination sewer cleaner from Sewer Equipment has a Hydro Drive powertrain system that eliminates the need for a transfer case, allowing the truck to operate in neutral for operator safety. Twelve-volt electrical switches and relays throughout the truck allow for easy field diagnostics.

Offering both single-piston and triplex pump options at 55 to 80 gpm at 2,000 to 3,000 psi and a 4,400 to 5,000 cfm blower at 18 inches Hg on an 8-inch system, the truck provides water and vacuum solutions for any situation. The 900 ECO is available in 6- to 15-cubic-yard debris body capacities, and it is equipped with standard Duraprolene water tanks carrying 900 to 2,100 gallons of onboard water. **800-323-1604; www.sewerequipment.com.**



Vacuworx International CC-TT double tee vacuum

The CC-TT computer-controlled double tee vacuum lifting system from Vacuworx International offers an alternative to using anchors and chains and eliminates the need for personnel to climb on stacks or ladders to set damage. The CC-TT has a multifunction, computer-operated remote control system with touch screen that provides real-time operation and diagnostic information, including vacuum pressure (reservoir and pads), fuel level, battery status and more. Closed-circuit cameras allow unobstructed views to enable precise pad placement. Variable pad positions ensure even lifting and avoidance of key stress points. The system is powered by a diesel engine and is designed to work with mobile or stationary gantry cranes. It has a lift capacity of 77,000 pounds. **866-664-3450; www.vacuworx.com.**



Vacall AllJetVac P Series combo sewer cleaners

Vacall AllJetVac P Series combination sewer cleaners use a positive displacement blower system to create reliable jetting and vacuum forces while efficiently opening and maintaining critical lines. The models have a blower system that is powered by the chassis engine, reducing fuel consumption and service time and also eliminating extra harmful emissions. The AllSmartFlow CANbus control system is standard; this allows for management of vacuum forces and water flow, reducing unnecessary refill trips. Also standard are aluminum water tanks. Galvanized debris tanks are optional. P Series models have a front-mounted, pivoting hose reel and an 8-foot-6-inch extending boom with 180-degree rotation. **800-382-8302; www.vacall.com.**



Parkson Corp. IGNITE integrated nitrification process

Parkson Corp. offers a nonactivated sludge lagoon treatment solution, the IGNITE integrated nitrification process, that combines Parkson Corp.'s Biofuser lagoon aeration system with the TumbleOx nitrification reactor. The IGNITE offering provides an option to achieve low effluent biochemical oxygen demand, total suspended solids and ammonia limits from existing lagoons without converting to an activated sludge process. **888-727-5766; www.parkson.com.**



Endress+Hauser Turbimax CUS50D sensor

The CUS50D sensor from Endress+Hauser is a reliable absorption sensor for turbidity and suspended solids measurement in unfavorable environments. Its design is made to withstand aggressive media and is an ideal solution for applications in industrial wastewater or processes. Digital signal process-



ing in the sensor and Memosens protocol provides reliable measurement results. The measuring principle is based on the attenuation of light and provides reliable measuring values. The measurement results can be achieved, for most applications, from a single-point calibration. The sensor is also already precalibrated from the factory for turbidity and absorption measurements and includes various application models. **888-363-7377; www.endress.com.**

Watson-Marlow Fluid Technology Group pumps with EtherNet/IP control

The 530, 630 and 730 peristaltic pumps from Watson-Marlow Fluid Technology Group now feature EtherNet/IP control. This protocol provides access to fast, accurate performance data and seamless connectivity to modern PLC control systems and the Internet of Things. Real-time communication makes processes secure and flexible. The pumps also include a direct interface to third-party pressure and flow sensors, which provides network access to sensor data. Local limits on pump operation can be set, providing a solution for safeguarding process integrity by independently monitoring performance. The sensors can bring the pump to a safe stop should the predefined limits be exceeded. **800-282-8823; www.wmftg.com.** ♦



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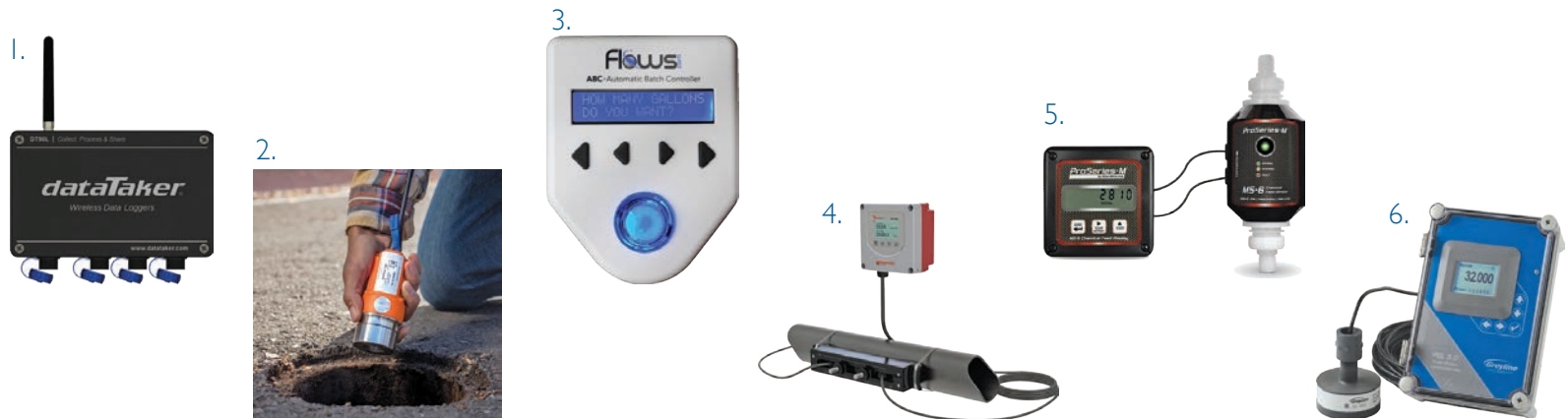
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FLOW CONTROL AND MONITORING

By Craig Mandli



DATA LOGGERS AND MANAGEMENT

1. CAS DataLoggers dataTaker DT90 Series

The **dataTaker DT90 Series** of compact, cost-effective and low-power data loggers from **CAS DataLoggers** are designed to provide an all-in-one data collection system with an integrated modem, specifically for remote applications. The rugged enclosure and wide operating temperature range provide reliable operation in virtually any environment. There are two models available, the DT90N and DT90L. The DT90N is suitable for smaller applications with digital or multiparameter sensors with a serial output. The DT90L is designed for larger applications with the ability to measure both analog and digital output sensors. **800-956-4437; www.dataloggerinc.com.**

2. Hermann Sewerin GmbH SePem 155

SePem 155 data loggers from **Hermann Sewerin GmbH** can help reliably identify existing leaks and catch new ones early on. In relation to the size of a measuring area, the volume of water initially escaping from a new leak is usually so low that it cannot be clearly distinguished from minimum night-time consumption when measuring the flow. However, the data logger is designed to report the leak after just one night. It is ideal for mobile use and can also be used for the stationary monitoring of water supply networks. Its simple and intuitive menu navigation provides fast and reliable results and can also be reliably operated by less-experienced users. The measuring times and periods of radio activity are freely programmable. **888-592-9916; www.sewerin.com.**

FLOW CONTROL/MONITORING EQUIPMENT

3. Assured Automation ABC-2020 Automatic Batch Controller

The **ABC-2020 Automatic Batch Controller** from **Flows.com** and **Assured Automation** works with a water meter with pulse output and a valve. Simply set the volume of water to be dispensed, then press the start button. Common municipal applications include truck and pool filling. It can be used whenever a specific amount of water needs to be dispensed accurately and repeatedly. The big blinking blue start/stop button indicates the controller status through blinking patterns: one blink per second while dispensing and 10 blinks per second when nearing completion. The controller can be purchased as part of a complete batching system with a variety of valves and meters. Custom systems are also available. **855-871-6091; www.flows.com.**

4. Badger Meter Dynasonics TFX-5000

The **Dynasonics TFX-5000** ultrasonic clamp-on flowmeter from **Badger Meter** accurately measures the volumetric flow of clean liquids and those with small amounts of suspended solids or aeration, such as surface water or raw sewage. It is suitable for water and wastewater applications such as lift stations, booster pump stations and water mains. This meter provides accuracy up to 0.5% and flow rates ranging from 0.07 to 33,000 gpm on pipes as large as 48 inches. Designed to clamp onto the outside of pipes, the meter does not contact the internal liquid, allowing for installation without shutting down operations in new and retrofit applications. It is equipped with an internal clock and built-in 8 GB data-logging capabilities to log flow down to one second. It also pairs with dual clamp-on resistance temperature detectors for Btu energy measurement. **877-243-1010; www.badgermeter.com.**

5. Blue-White Industries MS-6

The **MS-6** ultrasonic flowmeter from **Blue-White Industries** uses transit time ultrasonic technology to offer a broad flow range. It has measurable flow rates down to 0.15 gph and up to 158.5 gph. Accurately monitoring the amount of chemical being dosed into the system is crucial to ensure effective treatment. An overdose or underdose of chemical can adversely affect the quality of the treated water and leads to wasted chemical, which has a financial impact. **714-893-8529; www.blue-white.com.**

6. Greyline Instruments PSL 5.0

The **PSL 5.0** pump station level controller from **Greyline Instruments** has redundant level sensing. It includes a noncontacting ultrasonic sensor and can be connected to a loop-powered pressure sensor for redundant sensing in applications with foam or grease. It will continuously recalibrate the pressure sensor and automatically switch back and forth from ultrasonic to the pressure sensor as required. It is designed for lift stations, wet wells and storage tanks. Calibration and relay setpoints are easy to enter through the user-friendly keypad and menu system. An automatic pump runtime logging and reporting system helps operators to plan pump maintenance and identify lazy pumps before they fail. It includes an isolated 4-20mA output and six programmable control relays for pump control, pump alternation and level alarms. An intrinsically safe sensor and a built-in data logger are optional. **888-473-9546; www.greyline.com.**



7. Mueller Water Products Hydro-Guard

Mueller Water Products' Hydro-Guard industrial flushing system is designed for small-diameter waterlines where water-quality conditions, water age or excessive temperatures require water to be turned over frequently. The flushing schedule is managed by a Bluetooth controller that is powered by a single 9-volt battery. For more advanced system monitoring and management, the Hydro-Guard can be upgraded to include S.M.A.R.T. water-quality monitoring, an upgrade that triggers flush events when preset levels of chlorine, temperature, pH, turbidity, flow and/or pressure are detected. It can be installed either indoors or outdoors. The Hydro-Guard system comes with a 3/4-inch stainless steel Singer control valve and NSF 372 certified water-quality sampling point. **800-423-1323; www.hydro-guard.com.**

8. Orenco Systems OLS control panels

Orenco Systems Lift Station (OLS) control panels come with the choice of either integrated starters or variable-frequency drives that optimize system operation. These panels are suitable for a variety of pumping applications, such as lift stations, stormwater pump stations, water boosting, dewatering or sludge pumping. They can also be used as a SCADA patch, connecting peripheral equipment to future or existing SCADA systems. Parameters can be configured via a human-machine interface and include a user-friendly startup wizard. Engineers can preprogram user interfaces to the site-specific needs of an installation, making the panel virtually plug-and-play. Maintenance staff can easily adjust settings and monitor the system remotely. These weatherproof control panels are UL 508A listed and include service-rated circuit protection, phase and voltage protection, and level controls. **877-257-8712; www.orenco.com.**

9. Siemens Process Instrumentation SITRANS FS230

The **SITRANS FS230** flow system from **Siemens Process Instrumentation** delivers accuracy and 100 Hz data update speed while ensuring noise immunity and simplicity in use. It is not necessary to cut the pipe or shut down operations to install the flowmeter, as the sensors are quickly and easily mounted on the outside of the pipe, minimizing maintenance expenses and preventing deposits from forming. It has the ability to react to sudden changes in velocity, speed of sound in applications such as compressor stations. This allows the use of small volume provers for in-situ flow validation by measuring the smallest variations in flow 100 times every second. It offers accuracy of 0.5% to 1.0% of flow rate for all media/pipe sizes and repeatability of 0.25% according to ISO 11631. Its SensorFlash 4 GB micro SD card storage lets certificates, calibration data, sensor parameters and events be logged every 10 minutes for easy servicing and recordkeeping. **800-365-8766; www.usa.siemens.com.**

SENSORS

10. Hayward Flow Control HLS Series level sensor

The **HLS Series** level sensor from **Hayward Flow Control** provides a broad chemical resistance to acids, bases and oxidizers, like sodium hypochlorite, with its CPVC body and construction. It is typically placed at the bottom of a liquid storage tank or sump where the hydrostatic pressure is sensed and converted to an analog output signal (4-20mA). Pressure level sensors are not affected by liquid surface conditions like waves or foam or tank headspace conditions like vapors or thermal layers. No stilling well is required for accurate measurements. The sensors are provided in two measurement ranges: 0-15 and 0-33 feet of water column. Controllers and indicating transmitters for the unit are also available. **888-429-4635; www.haywardflowcontrol.com.**

11. PMC Engineering VersaLine VL2000-SW Series

VersaLine VL2000-SW Series submersible level transmitters from **PMC Engineering** are designed for use in wastewater pump and lift station applications. The ceramic capacitive sensing element provides a rugged open-faced design that avoids clogging or sludge buildup from the materials often encountered in wastewater. The stainless steel construction will satisfy most applications, but a titanium option is available where chemical environments dictate. The sink weight SW2000 was developed specifically for the VL2000 Series and is replaceable. This provides a "cage" sink weight or anchor for transmitters installed on the bottom of wastewater or sewage lift tanks. The standard polyurethane vented cable is molded to the transmitter, providing a high-integrity waterproof assembly. **203-792-8686; www.pmc1.com.**

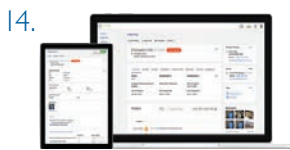
12. YSI, a Xylem brand, Alyza

Alyza analyzers from **YSI, a Xylem brand**, are available in single- or dual-channel versions and offer a MultiPort mixing valve that significantly reduces chemical consumption and maintenance requirements, lowering the overall cost of reliable data. They provide accurate measurements at low concentrations with minimal operator maintenance and include onboard diagnostics and automatic calibration and cleaning. The Alyza NH4 continuously measures ammonium and can be used to help control ammonia-based aeration and ensure regulatory compliance. They continuously measure orthophosphate to monitor and control chemical phosphorus removal, verify biological phosphorus removal and help ensure regulatory compliance. The analyzers easily integrate into existing YSI IQ SensorNet systems, which include a complete solution for monitoring throughout the municipal wastewater process. **937-767-7241; www.ysi.com.**

(continued)



13.



14.



15.



16.

SOFTWARE

13. ADS Environmental Services blockage PREDICT

Using either flow or level-only monitors that provide continuous, remote-site data from hot-spot locations, **blockage PREDICT** software from **ADS Environmental Services** analyzes subtle flow pattern changes. Prioritized by urgency and presented in the cloud-based software's dashboard, more than 500 notices have been issued to 75-plus utilities. Consequently, sparse maintenance resources are arriving at the right location, at the right time. Moreover, sanitary sewer overflows have been avoided. While reducing contact, maintenance capacity is concurrently reduced, impacting critical hot spot cleaning. **800-633-7246; www.adsenv.com.**

14. Aquatic Informatics Linko

A web-based version of **Linko** from **Aquatic Informatics** automates cumbersome tasks and ensures compliance for the management of FOG. It automatically determines noncompliance by analyzing inspection results and other data to prioritize facilities that require the most attention. It automates time-consuming tasks including scheduling, data entry and violation notifications, freeing up inspectors to focus on high-risk areas before they become a problem. Customizable, intelligent inspection forms perform calculations and even assess a facility's risk to ensure nothing gets missed during an inspection. Email features make it simple to share inspection forms and results with food service establishments, improving transparency and relations with establishments by giving them accurate, actionable data. **877-870-2782; www.aquaticinformatics.com.**

15. Hach Data Delivery System

The **Data Delivery System (DDS)** from **Hach** is an efficient flow monitoring service tailored to deliver relevant data when needed. For a fixed monthly fee, it provides all of the equipment, data transmission and technical support needed to acquire flow data — delivered in real time for immediate analysis. It allows operators to know their flow status anytime, anywhere, for either long- or short-term applications. **800-368-2723; www.hach.com.**

16. Syrinix RADAR

The **RADAR** pipeline network analysis platform from **Syrinix** analyzes data collected from installed **PEPEMINDER** monitoring devices and displays and notifies utilities in a format that is user customizable and easy to digest. The platform was developed to deliver network intelligence with a streamlined modern interface that is simple, fast and intuitive. Zone alarms notify a high or low pressure breach, elevation options plot total head pressures, and automated triangulation of major events and pattern recognition is available so users can easily focus on key events, providing deep network insights to save time, increase operational efficiency and build resilience by reducing disruptive pipeline leaks and bursts. The multizone alarms alert the utility when a minimum network pressure level is breached, automatically switching to more frequent data updates so customers can address network issues in real time. **844-279-7464; www.syrinix.com. ♦**

PEOPLE/AWARDS

Anna Massey was hired by Neel-Schaffer as an environmental scientist based in the firm's Chattanooga (Tennessee) office. She is also a member of the International Erosion Control Association and the Ecological Society of America and serves on the Stormwater Regulations Board of Chattanooga.

Brian Davis was hired as MS4 coordinator for Lower Swatara Township in Pennsylvania. MS4 stands for Municipal Separate Storm Sewer System. Stormwater requirements of the Clean Water Act are under the Pennsylvania Department of Environmental Protection's MS4 Program.

William Gomes, former Mifflin County (Pennsylvania) Planning and Development director, was honored with a 2020 Governor's Award for Local Government Excellence. Stormwater management plans were among the items he oversaw.

The City of Melbourne (Florida) hired **David Wilkison** to serve as its new city engineer. Wilkison has more than 37 years' civil engineering and management experience. Stormwater projects will be part of his responsibilities.

Cherokee County (Georgia) hired **Geoff Morton** as the deputy county manager. Among his duties is oversight of stormwater management building inspections. ♦

CALENDAR

Oct. 5-9

Water Environment Federation Technical Exhibition and Conference, virtual. Visit www.wef.org.

Oct. 7-9

Southeast Stormwater Association Regional Stormwater Conference, virtual. Visit www.seswa.org.

Oct. 20-22

Tennessee Stormwater Association Annual Conference, Montgomery Bell State Park, Burns, Tennessee. Visit www.tnstormwater.org.

Oct. 20-22

New Jersey Water Association Management and Technical Conference, Golden Nugget hotel, Atlantic City, New Jersey. Visit www.njwater.org.

Oct. 28-30

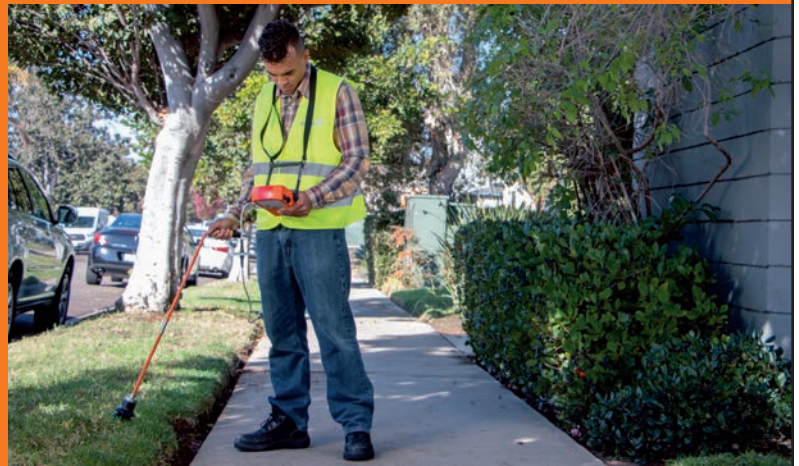
American Society of Civil Engineers Convention, virtual. Visit www.asce.org.

Nov. 9-12

American Water Resources Association Annual Conference, virtual. Visit www.awra.org.

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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Plant upgrades gas flowmeter at reclamation facility



Problem:

The Tres Ríos Water Reclamation Facility serves Tucson, Arizona, and treats 30 mgd. This recently modernized treatment plant has a capacity of 50 mgd. Plant engineers sought to upgrade their gas flowmeters that measure

biogas-feeding burners heating multiple hot-water boilers. The meters measure methane from multiple digester tanks that fuel the boilers to provide hot water and steam.

Solution:

FCI - Fluid Components International recommended installing its **ST80 Series** thermal flowmeter, which is suitable for biogas service. It features Adaptive Sensor Technology, which offers enhanced accuracy and repeatability in wastewater environments. This meter offers a hybrid sensor drive that combines constant power and constant temperature thermal dispersion sensing technologies. When in AST mode, the meter measures in constant temperature during startup through the lower flow ranges and then shifts into constant power mode at the midrange and at higher flow rates. The meters are installed on 8-inch-diameter pipes, Schedule 10S. They will measure flow rate and totalized flows. The range desired was 37 to 500 scfm, with 170 scfm typical, at temperatures from 78 to 110 degrees F, with 95 degrees F normal at pressures of 30 psig.

RESULT:

Plant engineers were pleased with the meter's accuracy of plus or minus 1% of reading, plus or minus 0.5% of full scale, and repeatability of plus or minus 0.5% of reading. The turndown ratio is a minimum of 2-1 up to 100-1, which accommodates demand swings. The flow range also met their biogas application needs. **800-854-1993; www.fluidcomponents.com.**



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City improves water treatment monitoring



Problem:

The City of Haverhill (Massachusetts) Water Division serves 58,000 residents and businesses and produces 2 billion gallons of water per year. The plant is manned continuously. Water comes from three sources; the city needed to better monitor water treatment and maintain high quality.

Solution:

GE Digital's **iFIX** allowed the city to move to a computerized process environment, giving it a cohesive system to follow procedures and respond

NV Mechanics Design - Water Tank Cleaning Robot WTC250

Underwater Tank Cleaning Robot WTC250 is a remote operated system built to clean Municipal and Industrial Water Tanks. WTC250 creates a safe working environment, provides faster cleaning process AND keeping the water tank online during cleaning.



Modular design allows cleaning attachments and sensors to be easily added or removed. WTC250 operates with 230VAC, 250 ft Kevlar reinforced umbilical, 5HP water pump, 2x HD cameras and lights. Video is recorded; control is intuitive and simple to operate, laptop provided

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CASE STUDIES

FLOW CONTROL AND MONITORING

to events in a consistent and sequenced manner. Management went further by purchasing laptops for on-call operators, enabling them to control operations from any location.

RESULT:

The move has given the plant more flexibility and reduced cost. "With iFIX, you can dial in the plant, get it set up and don't have to watch it as closely," says John D'Aoust, plant manager. "The team has all the features of the control room in their hands." 800-433-2682; www.ge.com/digital.

Sanitary sewer system updated with remote monitoring capabilities



Problem:

The Minneapolis Public Works Department needed to modernize the sanitary sewer system to meet the city government's goals. Minneapolis had nine sanitary lift stations and 23 storm sewer pump stations spread throughout the city. None of the stations had remote monitoring capabilities, and the Public Works Department wanted to add this capability.

Solution:

PRIMEX was chosen as the prime contractor to retrofit the existing stations by adding remote monitoring capabilities. The mandate was to develop and install a complete SCADA system that included the addition of digital cell routers on the Verizon network to improve monitoring. The upgraded system also incorporated a local computer memory at each site, ensuring that if for any reason the cell connection was down, the data would not be lost. The local Wonderware Edge graphical operator interface has native capabilities to both store and forward all data. When the Verizon communications are lost, the local OIT logs data to memory. Upon restoration of cellular communications, all of the historical information is backfilled into the historian so that there are no blackouts in data. This redundancy feature is the first of its kind and was successfully implemented for the city.

RESULT:

The sanitary sewer system is now able to meet the department's goals. Remote monitoring was added to all systems and helped improve their data analytics and enhance their ability to more effectively manage both storm sewers and sanitary sewers. 844-477-4639; www.primexcontrols.com. ♦

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KEEPING UP WITH CHANGE

It's time for a PACP-style certification program for automated defect recognition technologies

By Sheila Joy

The world of sewer condition assessment is changing at a rapid pace, and NASSCO is keeping in step to ensure its Pipeline Assessment and Certification Program supports all new technologies, including automated defect recognition technologies, which are sometimes referred to as artificial intelligence.

The number of software companies and other organizations developing ADR products has recently spiked. Indicators include NASSCO's membership roster, which has grown to include new, emerging companies in this space. NASSCO's staff is also busy meeting the increasing demand to provide an ADR verification program that's comparable to the PACP certification for traditional software products like import/export, import only or export only programs.

ADR, however, will require its own unique rating system on the accuracy of condition identification since it uses automated recognition based on a

library of condition imagery. As such, NASSCO has partnered with the Water Research Centre to identify companies potentially using the PACP or Manual of Sewer Condition Classification coding systems in their ADR products to ensure respective intellectual properties are protected through the licensing of PACP and/or MSCC codes in commercial applications of ADR technologies. The partnership between NASSCO and WRC has also resulted in a new accuracy rating system for ADR software that uses PACP codes, which is currently in development.

These are exciting times for our industry as technological advancements continue to improve the way we set standards for the assessment, maintenance and rehabilitation of underground infrastructure. NASSCO is proud to lead the way in ensuring the PACP language is universally used and understood. ♦

NASSCO (National Association of Sewer Service Companies) is

located at 2470 Longstone Lane, Suite M, Marriottsville, MD 21104; 410-442-7473; www.nassco.org

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

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Includes: ITCIP - CIPP

Trainer: Gerry Muenchmeyer

252-626-9930 • gerry@muenchmeyerassoc.com

Nov. 4

Lawrenceville, GA

Includes: PACP, LACP, MACP

Trainer: John Jones

678-527-4212 • plumblineconsultant@gmail.com

Nov. 5

Baton Rouge, LA

Includes: ITCIP - Manhole Rehabilitation

Trainer: Tim Back

513-253-8461 • timbacktwo@gmail.com

Nov. 10

Denver

Includes: ITCIP - Manhole Rehabilitation

Trainer: Tim Back

513-253-8461

timbacktwo@gmail.com

Nov. 16

Tucson, AZ

Includes: MACP, PACP, LACP

Trainer: Marilyn Shepard

916-899-8961

mshepard1@hotmail.com

Nov. 16

Frederick, MD

Includes: PACP, LACP, MACP

Trainer: Rizwan Siddiqi

443-739-9234 • rasiddiqi@gmail.com

Nov. 17

Framingham, MA

Includes: MACP, PACP, LACP

Trainer: Lindsey Sylvester

603-606-4436 • lindsey.sylvester@wright-pierce.com

Nov. 17

Orlando, FL

Includes: MACP, PACP, LACP

Trainer: Jerry Weimer

513-659-5008 • jerryweimerconsulting@gmail.com

Nov. 17

Houston

Includes: ITCIP - Manhole Rehabilitation

Trainer: Tim Back

513-253-8461 • timbacktwo@gmail.com

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OTHER CLASSES FORMING

Contact one of the trainers listed above if you are interested in having a class at your facility or in your area.

Tuthill Corp. announces Thill as president of Tuthill Springfield

Tuthill Corp. named Tony Thill as president of Tuthill Springfield of Missouri. Thill is a senior executive leader with more than 30 years of experience with industrial manufacturing companies. He will lead Tuthill's commercial and operational strategies for the Kinney vacuum pump and M-D Pneumatics industrial blower product lines. Thill's experience will guide market share growth, lean manufacturing advancement and support Tuthill's enterprise-wide digital expansion and realization. He graduated from the University of Kansas with a bachelor's degree in business administration and completed the Executive MBA program.



Tony Thill

Kaiser Premier announces partnership with Hathorn

Kaiser Premier announced a dealer/distributor and authorized service center partnership with Hathorn for its line of pipeline inspection camera solutions covering the West Coast of the U.S. Kaiser will be selling Hathorn's DuraScope line of standard and Wi-Fi camera reels. The reels come fitted with the DuraCAM line of camera heads, command modules featuring VividHDTM and complete inspection camera systems.

Griffco Valve appoints Lucas as Western sales manager

Griffco Valve announced the appointment of Gregory T. Lucas as U.S. Western regional sales manager. He will be responsible for providing training and sales support for the company's distributors, as well as expanding the company's distributor network. Lucas joins the company from NETZSCH, where he served as regional sales manager for Texas and Oklahoma. During a career spanning more than 30 years, he has held sales and sales management positions at Grundfos, Oliver Equipment Co. and other companies in the chemical and petrochemical processing industries.



Greg Lucas

Total Equipment expands Vermeer industrial representation

Total Equipment acquired the rights from Vermeer Caribbean to represent the Vermeer industrial product line in the U.S. Virgin Islands,

Haiti and the Dominican Republic. Under the leadership of Charles de Armas, Total Equipment has represented Vermeer Corp.'s sales, service and parts in Puerto Rico since 2014. With this acquisition, the dealership will now operate under the Vermeer Total Equipment brand. Company headquarters will remain in Puerto Rico while the dealership offers the full line of Vermeer industrial equipment and full-service operations on the island of St. Thomas, U.S. Virgin Islands, and a commercial office in the Dominican Republic.

Utilis announces new partnership with Innovyze

Utilis announced that Innovyze has become the latest member of its USA Partner Program. The program is a symbiotic relationship between Utilis and the partner, where both companies promote and grow business as a team. Reciprocally, Utilis joined the Innovyze Partner network for integration into its InfoAsset product line.

Vacuworx welcomes senior director of sales

Vacuworx welcomed Charlie Cunningham to the North America sales and leadership teams as senior director of sales. Cunningham brings more than two decades of experience in sales, marketing and business development activities. He recently spent 15 years with Astec Industries as vice president of sales. With Astec Underground and GEFCO, he led the development of initiatives to identify potential markets, new products, and sales and marketing domestically and internationally. ♦



Charlie Cunningham

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see photos in color at www.mswmag.com

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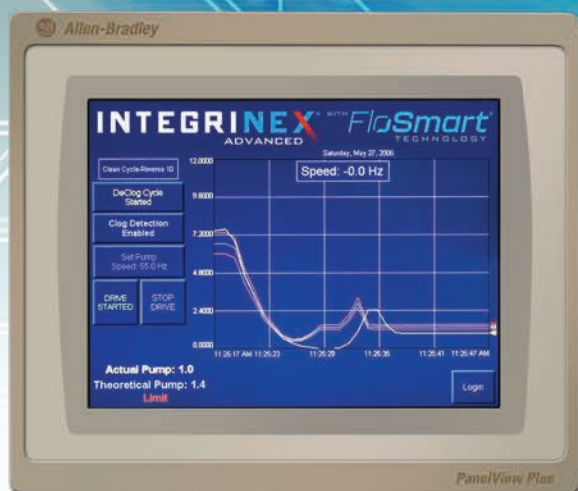
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