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FOR SANITARY, STORM AND WATER SYSTEM MAINTENANCE

June 2021

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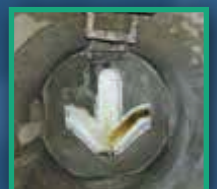
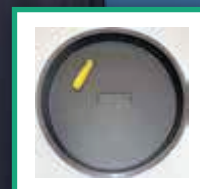
BUILDING CORE COMPETENCIES

Specialized training reduces
California utility's costs
and increases efficiency

PAGE 12

Steve Moore, General Manager
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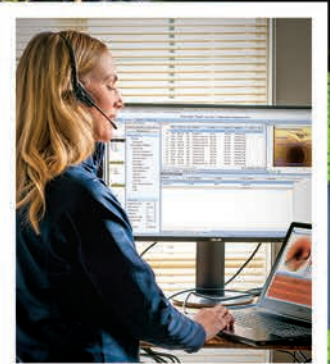




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ON THE COVER: Ross Valley Sanitary District General Manager Steve Moore poses in front of one of the district's Vactor trucks in the RVSD yard in Larkspur, California, north of San Francisco. The district now uses competency-based training, originally developed by the military, to improve employees' knowledge retention and efficiency. (Photography by Collin Chappelle)



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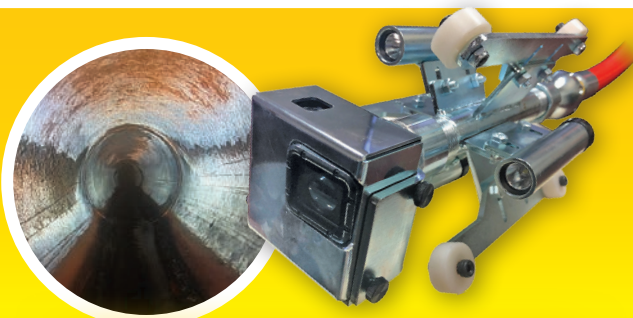
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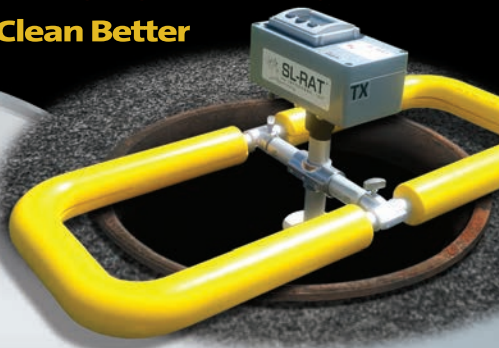
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Luke Laggis

KEEP IT INTERESTING

There's always more to learn and a fresh way of looking at your utility operations

When people ask what I do, I tell them I'm an editor. If they ask what I edit, I tell them it's a publication for the water and wastewater industry. That's where the conversation gets interesting, at least for me.

Most people aren't blown away by how cool that sounds. But it's fun explaining what I do and giving a little insight on an industry they've typically never given any thought. By the end, they usually find it a lot more interesting, too.

I like understanding how things work. I like knowing the backstory. Once when I was a daily newspaper editor I had the great fortune of working with an art director from *National Geographic* on a full redesign of the

paper. He played a part in developing the *How It's Made* series, and it was interesting talking to him because we both shared a sort of fascination with how the everyday things around us — from doorknobs to vacuum pumps — are designed and constructed.

When I came to COLE Publishing, that fascination fueled my water and wastewater education. Much of it was new to me, and that made it interesting. And with new approaches and technology constantly emerging, it's easy to stay engaged.

If you approach problems with that same desire to understand how it works, what's going wrong and how it can be improved, you'll keep your utilities on the right track. New approaches, better tools, and advancing technology give you an ever-evolving slate of solutions to the problems you encounter in your systems.

This month's Better Mousetraps and Supply Side installments feature some technology that can answer important questions. How do we protect our waterways? How do we keep our sewer cleaning crews safe?

The latter is of special significance right now since June is National Safety Month. If you're running a wastewater utility, you have people routinely cleaning and maintaining your collections system, and they're regularly coming in contact with dangerous pathogens. Hydro Products, featured in this month's Supply Side column, addresses those concerns with the Vanguard Pathogen Defense System.

For the Florida Keys Aquaduct Authority, the question of how to better protect sensitive waterways was answered by ReignAir ARV monitors from Reign RMC. Debris in the wastewater flow was clogging floats on air release valves and causing leaks. Finding them immediately was difficult, but a new monitoring system has enabled immediate response and prevented leaks.

I'm not saying either one of these products are automatically going to revolutionize the way you maintain your collections systems, but either one could. More important, I think, is keeping your eyes on the industry as a whole, to new developments and methods you can bring in-house to make meaningful progress. It's good for your utilities, and it keeps the job interesting.

In fact, the most interesting people I meet in this industry are those who are constantly looking for better ways and new solutions to the issues their utilities face. I enjoy those conversations, and I like to keep them going in these pages.

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.

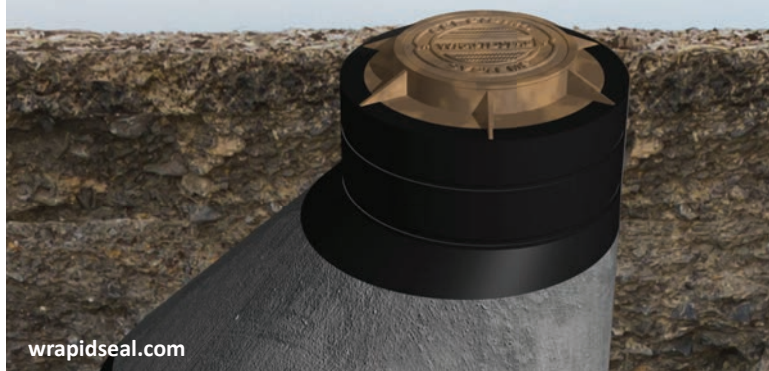


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“Over the past year our hardworking committee members have developed new NASSCO Specification Guidelines for styrene-based resins, smoke testing and rehabilitation with fiber-reinforced polymers.”

— **NASSCO Develops New Sewer Service Guidelines**
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RECENT RESEARCH

Longer, More Frequent Droughts in Store

A new study shows average temperatures have increased, annual rainfall has decreased, and dry periods have become longer across the American West over the past 50 years. In hopes of understanding how significantly rainfall totals and timing have changed, researchers analyzed daily meteorological data from over 300 long-term weather stations across the western U.S.

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UTILITY ASSISTANCE

Incentive to Replace Lead Pipes

The Environmental Policy Innovation Center has announced the launch of its Lead-Free Water Challenge which will help incentivize small municipalities to remove and replace their lead service lines by offering technical assistance, connections to resources and funders, policy guidance, and information-sharing through peer networks.

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FINDING THE FAULTS

Quantifying I&I

Inflow and infiltration issues must be identified accurately and efficiently. In this online exclusive article, industry veteran Richard Cummings credits emerging technologies for giving Hillsborough County, Florida the quantifiable data it needs to help take human error out of the equation.

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BUILDING CORE COMPETENCIES

Specialized training reduces California utility's costs and increases efficiency

By Ken Wysocky

During the past decade, the Ross Valley Sanitary District has experienced a seismic shift in operations, including \$100 million in infrastructure improvements, investments in asset-management technologies, and in-house maintenance and repair of sewer lines and pump stations.

The utility — based in San Rafael, California, about 20 miles north of San Francisco — was established in 1899 and is one of the state's oldest wastewater utilities. Beyond infrastructure and technology investments, it has also embraced a training method that captures institutional knowl-

“Today we have a much more consistent work environment.”

Steve Moore

edge about processes and procedures. Known as competency-based training, it has improved workers' retention of that knowledge and, in turn, increased their efficiency, says Steve Moore, the utility's general manager.

Developed by the military, CBT centers on comprehensive, step-by-step training protocols that emphasize consistency through numerous repetitions, which leads to competency.

“Everyone knows training is important, but we didn't have an organized training program — just a manufacturer's manual or a consultant's emergency procedures report,” Moore explains. “But those references don't assess an employee's competency on using equipment such as hydro-jetters, vacuum trucks and pipeline inspection cameras.”

That's where CBT comes in. After the utility develops detailed standard operating procedures and trains employees by using those procedures, a trained assessor then grades them on how well they understand or don't understand each task embedded in the SOP.



Ross Valley (California) Sanitary District General Manager Steve Moore (second from left) and operations managers Noel Sandoval, Manuel Vigil and Rafael Zarco (from left) have helped further the district's competency-based training program. (Photography by Collin Chappelle)



PROFILE:

Ross Valley Sanitary District, San Rafael, California

SERVICE AREA:

Nearly 27 square miles in Marin County

WASTEWATER INFRASTRUCTURE:

Approximately 194 miles of wastewater sewers, 8 miles of force mains, 19 pump and lift stations, 5,200 manholes and rod holes

DAILY WASTEWATER COLLECTION:

Approximately 4 mgd

EMPLOYEES:

35

WEBSITE:

www.rvsd.org



Ross Valley Sanitary District collections worker Ricky Smith prepares the inflation line for an epoxy patch carrier. Ross Valley is one of California's oldest wastewater utilities, with aging clay pipes that require regular maintenance and repair.

“We are no longer managing crisis by crisis, or by using imprecise metrics like ‘miles cleaned.’”

Steve Moore

The rest of the training then focuses on what employees don't know, which develops more qualified equipment operators.

“After assessment, we train to what they don't know, which we call training to the delta,” Moore says. “And by developing SOPs, we capture institutional knowledge that can be transferred to new employees. That knowledge doesn't disappear if, say, an employee retires.

“Competency-based training enables us to tacitly embed knowledge for new operators more efficiently and methodically than before, using consistent, user-friendly standard operating procedures for the full variety of tasks, developed by internal subject-matter experts.”

The utility started using CBT in 2017 by hiring Competency Training Systems International. A chief technology officer from CTSI helped the utility develop the procedure-based SOPs.

Practice makes perfect

Moore cites cured-in-place point repairs as an example of the benefits CBT brings. Without competency-based SOPs, it might take some employees up to two years before they feel confident making the point repairs.

“But with competency-based training, they're up and running in about a month,” he says.

The secret sauce is the step-by-step SOPs, which make liberal use of pictures with text boxes and arrows.

“People respond more favorably and efficiently to pictures than manuals and text, so the step-by-step training with visuals, repetitions and constant feedback better engages the workers,” Moore explains. “Before, everyone was trained differently by word-of-mouth for the same job.

“Today we have a much more consistent work environment. We've also reduced the amount of time it takes to complete tasks, which allows us to get more done in less time.”

Hundreds of training modules have been developed in all, ranging from operating equipment to maintaining lift stations to flushing sewer mains using specialized vehicles.

“We've covered the critical tasks, but SOP development and training is ongoing as new equipment is brought online. It's really a never-ending process,” Moore says.

In-house expertise

For an example of how CBT reduces expenses, consider the cured-in-place point repairs. Some utilities install one point repair liner a day, while RVSD crews perform an average of three per day and have installed as many as seven in a day, says Manuel Vigil, repair supervisor.

Furthermore, doing the work in-house saves money. Having an outside contractor do a point repair would cost about \$2,500. With an average of 400 such repairs annually, that comes to \$1 million, he says.



“We now clean a couple thousand less feet of pipe per year while at the same time we’re still experiencing fewer overflows.”

Rafael Zarco

Collections assistant Dale Olsen, crew lead Frank Sousa and collections worker Ricky Smith (from left) spread epoxy resin on a fiberglass patch before installation.

GETTING BUY-IN FOR NEW PROCEDURES

Operational changes are often difficult. After all, when employees are used to doing things the same ways for years, it’s hard to leave that comfort zone and do something new.

The Ross Valley Sanitary District encountered some employee pushback when it decided to adopt a new training protocol known as competency-based training, says Felicia Newhouse, the utility’s assistant general manager.

Newhouse is a strong proponent of the training system. But she says even though CBT was intended to improve operations by helping employees become more proficient at various tasks much faster, getting buy-in from employees was difficult at first.

“There was pushback from the union, just as there can be with any new process. The union had legitimate concerns about fairness and transparency. They didn’t want the competency-based training to be used against employees.”

To ease those concerns, the utility formed a joint labor-management committee that walked everyone through the basics of CBT. The group also spelled out how the new training method could improve efficiencies and retain institu-

tional knowledge, as well as the importance of union buy-in.

“We negotiated an agreement with the union that established expectations about how CBT should work, and that facilitated the transition to CBT,” Newhouse explains.

For example, the utility agreed to bring in third-party assessors, such as retired wastewater-system equipment operators, to do the employee training assessments. This impartial approach helped alleviate any concerns about favoritism in the assessment process.

“Our operators embraced that aspect.”

Since the joint guidelines were developed and negotiated, employees have been very supportive and have provided valuable feedback as training protocols were developed.

“The primary stakeholders — supervisors and front-line staff — were key,” Newhouse says. “We could not have done this without the buy-in from staff and subject matter experts.”

“We now have trust in and ownership of the system. But you’re never done, a continued commitment to stewardship and leadership ensures that everyone keeps trusting the CBT program.”

“We can do the same number of repairs for about \$400,000 in labor, equipment and materials, so we save the district about \$600,000 a year. So over the years, we’ve saved millions of dollars by doing point repairs in-house.”

To handle the work, the utility invested in a 2014 Isuzu NQR cube van that carries a wet-out table. Vigil buys generic components such as the epoxy, fiberglass liners and inflatable bladders to create a customized point-repair system.

“That way, the things we need for point repairs cost \$50 to \$60 versus \$400 to \$500,” he says.

System challenges

A spike in sewer overflows, followed by a cease-and-desist order from the state’s Regional Water Quality Control Board issued in 2013, also spurred changes at RVSD.

In addition to investing approximately \$100 million in infrastructure improvements and upgrades to reduce overflows, the utility adopted new technologies to assess and manage its 194 miles of gravity sewer, 8 miles of force mains, 5,200 manholes and rod-holes, and 19 pump and lift stations.

The collections system serves about 47,000 customers and transports approximately 4 mgd to a treatment plant operated by the Central Marin Sanitation Agency. The agency operates under a joint agreement among the RVSD, the San Rafael Sanitation District and Sanitary District No. 2 of Marin County.

(continued)

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Collections worker Darrell Proschold rewinds the jetter hose after completing the last of several routine cleaning runs in a residential area north of San Francisco.

Another critical step in the utility's evolution involved creating a risk-assessment model for its infrastructure, then developing a structured management plan to address long-standing deficiencies.

To do this, the utility invested in ArcGIS software from Esri, and InfoAsset, a maintenance-management system developed by Innovyze. The two work in concert to help the agency develop an enterprise asset management and maintenance system.

"Every asset now is on a maintenance, repair or capital improvement schedule," Moore notes. "The asset management program provides a comprehensive inventory and ongoing condition assessment, as well as a platform to prioritize repairs and rehabilitation and adaptively manage preventive maintenance schedules.

"In essence, these technologies allow us to make data-driven decisions about how to extend the life cycle of our assets in a proactive manner instead of a reactive manner. Regulators and ratepayers now see an agency that has a transparent, risk-based approach to in-house repair and maintenance, as well as a capital improvement program. We are no longer managing crisis by crisis, or by using imprecise metrics like 'miles cleaned.'"

Fewer overflows

Sewer overflows, for example, dropped to 13 in fiscal year 2019-20 compared to 38 in the 2016-17 fiscal year. In addition, gallons of wastewater spilled decreased significantly during the same time period, from 135,000 gallons down to just 3,682 gallons.

For an even starker comparison, overflows spilled almost 3 million gallons in fiscal year 2010-11, he notes.

Another benefit: The technology helped the

utility become more surgical in terms of preventive maintenance.

"Our motto became 'clean only what needs to be cleaned,'" says Rafael Zarco, line maintenance supervisor.

The upshot is that the agency no longer operates with a mentality that every pipe needs to be cleaned on a regular basis. Instead, the technology allows officials to prioritize which pipes need cleaning based on how much debris is removed as well as the condition assessment data.

"We now clean a couple thousand less feet of pipe per year while at the same time we're still experiencing fewer overflows," Zarco says. "Furthermore, cleaning a clean pipe produces unnecessary wear and tear on the system."

Equipment investments

To do more work in-house, the utility has invested significantly in equipment. The RVSD's equipment roster includes a Vac-Con combination truck, two Vactor Ramjet truck-mounted jetters, built out on International chassis with 1,500-gallon water tanks and Vactor water pumps.

The utility also relies on two low-volume, high-pressure jetting trucks outfitted by Harben on Ford F-550 chassis with 600-gallon water tanks and Harben pumps.

Crews tackle sewer line inspections with two camera trucks, both Mercedes-Benz Sprinters. One carries a RapidView IBAK Panoramo 4K camera system and the other transports a Pathfinder system from Aries Industries. Both systems utilize WinCan data-collection software.

The RVSD also owns push cameras made by Envirosight, CUES and IBAK.

Scalable approach

The RVSD's experience with CBT offers some clear takeaways for other utilities.

For starters, Moore would like to dispel any notions that CBT is feasible only at larger utilities. It's very doable for small agencies, too, with the right program and right people in place. (The RVSD has just 35 employees.)

Furthermore, Moore encourages other utilities to think outside the box and be willing to take chances, then learn from any mistakes. As an example, he cites failed point repairs.

"You just have to commit to reviewing repairs as part of CCTV work, and where you identify defects, do a failure analysis, then modify the SOP if necessary to reflect the findings of that analysis. Then it's automatically incorporated into training as the SOP is implemented."

Moreover, utilities should take advantage of efficiencies offered by new technology, such as the ArcGIS and InfoAsset systems, Moore says.

"Technology is key. Everybody has a cellphone and portable laptops are more affordable and durable. Work orders and sewer system maps, with sewer lateral or asset information history at our fingertips, are creating efficiency and effectiveness in the field.

"It's also increasing the confidence of our workforce to get the job done to protect public health and the environment."

Accomplishing goals

But no matter how the utility evolves, CBT training will remain a cornerstone of its operations.

"Our main goal with CBT was to create a consistent, safe and effective work environment," he says. "And our long-term goal is to keep the sewer rates low and ensure public health and safety. And I think we're accomplishing all those goals.

"We've come a long way. We're totally committed to the path of continuous improvement and adaptive management." ♦

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SPOTTING PROBLEMS BEFORE THEY HAPPEN

Reign RMC release valve monitors help protect sensitive Florida Keys waterways

By *Tim Dobbins*

Supplying the residents and visitors of the Florida Keys with water and wastewater services has its own unique set of challenges, and air release valves mounted on the numerous bridge crossings make valve monitoring a time-consuming and difficult process for the Florida Keys Aqueduct Authority.

“We have issues, especially in sewage, with our air release valves from debris getting into the floats causing leaks, which is obviously a big concern for our waterways and the environment,” says Mike Pullis, wastewater mechanical supervisor for the Florida Keys Aqueduct Authority.

“It’s saved me on a few leaks, issues where we were going to have sewage going into the waterways.”

Mike Pullis

An alarming solution

Lucky for Pullis, Reign RMC recently reached out to the Aqueduct Authority offering to test its air release valve monitoring system on one of the bridge crossings. The monitor is designed to help municipalities improve efficiency and get a leg up on increased pump run times, pump failure, valve leaks, pipe breaks or other possible problems by notifying them of issues before or precisely as they happen.

Within a few weeks after installation, Pullis says it alerted him to a potential issue and he was able to rectify the situation before it became serious. After that incident, he purchased another unit. “They came out with a new model, battery operated instead of solar, something you could put down somewhere like in a manhole, which I thought was a good idea.” Pullis ordered that new model and made sure he included the pressure sensor option so he could monitor pressures on the force mains.

The new model has been installed and operating on an ARV at a different bridge crossing for around eight months. “It’s saved me on a few leaks,



The Florida Keys Aqueduct Authority addressed leaks caused by debris getting into air release valve floats with the installation of ReignAir release valve monitors at bridge crossings over sensitive waterways.

issues where we were going to have sewage going into the waterways,” he says. “I was able to get a call out and get our mechanic to shut that valve and clean that ARV.”

Since then, Pullis has budgeted for roughly 20 more ReignAir ARV monitors (Reign RMC) in next year’s budget to allow for one at every bridge crossing in his service area.

Data made simple

If the float that seals the valve in an ARV is damaged in any way, it triggers a leak. That can come from garbage or debris getting lodged in the

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BENEFITS:

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USER:

Florida Keys

“Some of these valves could be leaking for days or weeks without anyone noticing, so this product is going to save us.”

Mike Pullis

float or if the diaphragm itself gets a hole or tear. If that happens and water or effluent leaks into the vent tube where the ReignAir leak sensor is mounted, the proximity sensor will detect even a trickle of fluid and send the signal that a leak has started.

The second monitor Pullis purchased detects leaks as well as monitors air pressure. The air pressure sensor is fully programmable to whatever specifications the operator chooses. “Let’s say at one part of the pipe 25 psi is normal and at another part 75 psi is normal. We would set that up to notify if pressure ever got above 75 psi,” says Marty Pitzen, vice president of sales and marketing at Reign RMC. “As soon as it hits 75.1 psi, it immediately sends all of its information and alerts the operator. They will also get alerted of a zero-pressure reading signaling that the valve is dead.”

The monitoring units feature a mapping function to provide a wide status of all active sensors at a glance, and pinpoint GPS logging helps keep track of remote or hard-to-reach valves and allows operators to go directly to the exact location of a failing valve.

“I have it set up to email and text message me,” Pullis says. “I can also program it to send the alert to multiple phone numbers so it can email me, my foreman, a standby, whoever it takes to get a rapid response.”

The ReignAir release valve monitor not only illustrates live pressure readings, but logs and displays historical data through a cloud-based and cellular system allowing recorded information to be accessed from any phone, tablet or PC from anywhere in the world at any time. “Because we are storing all this data, subscribers can go back at any time and pull all these readings, dump them into an Excel file and make graphs, compare or do whatever they want with the data,” Pitzen says.

The monitoring units feature a mapping function to provide a wide status of all active sensors at a glance, and pinpoint GPS logging helps keep track of remote or hard-to-reach valves and allows operators to go directly to the exact location of a failing valve.

Changing the game

The addition of more monitoring systems will change the way Pullis and his team operate. “We are doing our ARV monitoring every two months. We are sending crews out to check on them and clean them,” Pullis says. “Other than that, we have no telemetry other than if someone drives by and visibly notices something leaking.”

This creates problems, including response time, if valves are leaking or other issues are occurring within the line, making more work for the team. “Some of my ARVs are in inconspicuous areas where people aren’t around too often. Some of these valves could be leaking for days or weeks without anyone noticing, so this product is going to save us.”

A leaking release valve that goes unnoticed requires more than just a simple fix, adding time to an already full schedule from filling out paperwork and dealing with the potential environmental impacts. “You never really know how long it’s leaking, so then you have to report it to the Department of Environmental Protection,” he says. “With these I’ll know right away if something is leaking so I can get out there right away and shut it down.”

The addition of leak detection and pressure monitoring units allows Pullis and his team to prioritize maintenance and tackle problematic valves before they get out of hand. “It’s a lot better for paperwork, for me and my crews, and most important, the environment.” ♦



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NAME:
T.J. Suiter

JOB TITLE:
President

YEARS IN THE INDUSTRY:
30+ years

YEARS WITH COMPANY:
10

Hydro Products provides pathogen defense for sewer cleaning operations

By Luke Laggis

T.J. Suiter got his start in the sewer and drain industry over 30 years ago when he started a pipe cleaning and inspection business in Denver. The company specialized in residential and commercial work for the first few years before moving into municipal work.

During his off hours, Suiter volunteered with a couple organizations, including a local hospice. It was there that he began learning about the pathogens he could potentially be exposed to from patients, how they can transfer and, most important, how to handle them to keep himself and others safe. It was a unique situation, working with raw sewage by day and with terminally ill patients by night.

With new knowledge of pathogen transfer, Suiter started thinking about the dangers posed to those in the wastewater industry. The same pathogens that hospice workers wore gloves, gowns and face shields to protect themselves from coming in direct contact with were in the wastewater stream, splashing around and getting on workers. And they were often left behind in puddles on the street or yard. So he decided to do something about it to help reduce exposure and protect his team.

The result was the Vanguard Pathogen Defense System.

Municipal Sewer & Water recently caught up with Suiter to talk about his company, Hydro Products, and the Vanguard System.

It took off quicker than expected because customers really saw the need for it.

T.J. Suiter

MSW: What is the Vanguard System and how did you develop the technology behind it?

Suiter: The Vanguard System is purpose built to do one thing: keep dangerous pathogens in the sewer where they belong and not emerging to the surface prematurely where they have the potential to harm sewer maintenance crews and people living in the community.

The word “Vanguard” means “advanced guard” or leading edge of an assault in a battle. This cleaning system is exactly that. Not only does it immediately reduce the pathogen load where it is the most concentrated on the jet hose, but also strips off grease and sharp objects like glass or hypodermic needles that may have attached themselves to the hose during the jetting process. This physical and water-spray barrier helps remove them from the jet hose as it passes through the center of the cleaning collar. This aids in the effort to keep these and other dangerous objects in the manhole and away



The Vanguard Pathogen Defense System is built to remove dangerous pathogens from sewer cleaning equipment before they can be brought to the surface, potentially harming workers and the community.

from the operator. In addition, the hand-held spray gun can clean off most everything else that was exposed to the raw sewage in the area.

My first business was a pressure washing and steam cleaning service. I was able to integrate my knowledge of pressure washing technology and being an inventor to build my original system. One of my gifts is the ability to surround myself with those who have more abilities than I do and get their assistance in their various areas of expertise.

(continued)



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MSW: What challenges have you faced in gaining acceptance of the system's value and effectiveness?

Suiter: The Vanguard System was officially offered to the market nearly 10 years ago. It took off quicker than expected because customers really saw the need for it. It picked up more steam after our customers started talking to other agencies about their positive experiences with them. The bottleneck was on my end because sewer maintenance teams really wanted to see the system in person, which involved quite a bit of travel across the country doing demonstrations. That is when I started involving dealers to help show the equipment in person.

The major turning point came when I was introduced to the portable ATP (adenosine triphosphate) tester. This testing system is typically employed by hygiene companies or health departments to detect bacteria and other living organism loads on various surfaces for hospitals, veterinary clinics, restaurants, etc. The rating scale ranges from 0 to 9999 to test for cleanliness. The lower the number, the cleaner the surface. The addition of this equipment for demos was an absolute game-changer for us. When we show up at the customer's job site and show them the before and after ATP count on their own equipment by employing our system, they quickly become believers. We typically reduce the ATP count by around 98% right in front of them.

After purchasing the equipment and using it for a while, they often wonder why this type of equipment was not commercially available sooner. We have an amazing reorder and retrofit rate for other vehicles in our customers' possession once they experience the benefits themselves.

MSW: Can the system be adapted to fit any jetting or jet/vac truck? What about trailer jettors and inspection vans?

Suiter: Yes, we have different Vanguard System configurations for combo trucks, jet trucks, CCTV vehicles, and yes ... even trailer-mounted units. Depending on the system we are mounting it on, there are various install kits we offer to accommodate any make or model of vehicle. The system comes standard with a hand-held spray gun to help clean a wide variety of surfaces, like boots, gloves, tiger tails, vacuum tubes, crawlers and even SSOs.

MSW: How has the system evolved to better meet the needs of municipal wastewater crews?

Suiter: When the system was first introduced, it worked perfectly in the comfort and warmth of our office on the test bench. However, like any invention, a few problems came to light and had to be addressed after it was released into the harsh "real world" environment of sewer maintenance. The biggest change was the introduction of our cleaning collar several years ago which made the system super easy to deploy within seconds from the operator's station. This made it remarkably simple for the operator to use with little distraction from their routine. We also made several design corrections and modifications over the first few years to replace vulnerable or underperforming components. We have moved through that adjustment season a few years ago, and now have a thoroughly tested, reliable and easy-to-use product.

MSW: Does the cleaning solution have any adverse effects on the collections system or the surrounding area?

Suiter: No, not at all. The cleaning solution is made of compounds that are regularly dumped into the sanitary sewer system every day by hospitals, laboratories, schools, veterinary clinics, etc., in much higher amounts than we would ever use. The solution was custom designed for use in the wastewater environment, and safe to use for the operator and the maintenance equipment when used in accordance with the directions.

MSW: What's the biggest threat to workers who come in contact with wastewater, and are you seeing an increased interest in worker health and safety since the pandemic began?

Suiter: The increased awareness of dangerous pathogens across the globe has shed a spotlight on what can, is, and will continue to happen in our fight against microbes. It has certainly boosted demand for our product to help add an additional layer of protection for cities, their workers and citizens in the community at large. Although COVID-19 (and now all the variants) continue to be a health threat in our world, it is only one of several concerns in wastewater. Notably, when compared to several other current biological hazards found in wastewater, COVID is dwarfed in severity by several others. The ever-increasing levels of numerous antibiotic-resistant strains of bacteria compounded by mutating virus strains can be extremely dangerous and are significantly rising as noted in several medical research papers. COVID-19 has overshadowed many things in our society and waste-

water safety in regard to other pathogens is no exception. Increasing levels of CREs (carbapenem-resistant Enterobacteriaceae) are on the rise. These are bacteria strains that are immune to most of our antibiotics. A recent study by mBio released in February 2018 showed that pipes outside hospitals are teeming with CREs at levels nearing 80%.

In 2020, Rutgers published another study in the journal *Environmental Science: Water Research & Technology*, which showed similar results. They found that these biofilms often contain harmful, antibiotic-resistant bacteria and can withstand standard treatment to disinfect sewers. These are most concerning to the safety and health of wastewater workers in my opinion.

MSW: Is the Vanguard System effective on viruses and is your disinfecting solution on the approved EPA/CDC list for COVID-19?

Suiter: The system has been independently tested and is shown to remove up to 98% of pathogens in an independent lab study many years ago. The system targets all organisms affixed to the jet hose and strips them off. The main ingredient in our cleaning solution is a blend of quaternary ammonium compounds and a few other effective cleaning products. Quaternary ammonium compounds are at the very top or really close to it for killing COVID-19 virus.

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

Suiter: We have many wastewater equipment dealers across the U.S. and Canada and now in Australia that rep our product line. Typically, we receive phone calls directly from public works directors, sewer maintenance supervisors and people in upper management looking to protect their team as well as the public. Our dealers are fantastic, as they can install the equipment locally if the customer doesn't wish to take it on in-house. They also can quickly respond in person to provide one-on-one service and personal support.

MSW: Are there product line expansions in the company's future? What else does the future hold for Hydro Products?

Suiter: We are constantly developing new and innovative ways to help protect workers in this vital sector of service. Let's face it, dangerous pathogens will be here long after we are gone from this Earth, so we have to do what we can to stay one step ahead to help keep the community healthy and safe, not just for our own sake, but for future generations. We are working on another product line that is already protected by a couple of our currently issued patents, and we will be releasing it next fall. ♦

The increased awareness of dangerous pathogens across the globe has shed a spotlight on what can, is, and will continue to happen in our fight against microbes.

T.J. Suiter

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SHELTER FROM THE RAIN

Pacific Northwest community optimizes its vacuum sewer system with cutting-edge telemetry monitoring

By Suzan Chin-Taylor



Miles Crossing (Oregon) Sanitary District Superintendent Carl Gifford looks on as operator Brandon Smith (center) and laborer Wesley Jiroch prepare to install an upper valve body at a pit in the district's vacuum sewer system. (Photography by Justin Grafton)

“Our job became finding out where that excess water was entering the system, and then correcting it.”

Brandon Smith



Making the switch from a purely septic-based wastewater handling model to a publicly owned and operated vacuum sewer system solved problems for the small community of Miles Crossing, Oregon. It also brought unforeseen inflow and infiltration issues.

Rain events revealed the need for tracking down operational overload issues in the system, which could only effectively be accomplished via automation tools. Retrofitting a monitoring system has given the district's operators a real-time view of their system, potential sources of I&I, and a means to protect the mechanical health of this key community infrastructure investment.

Operator Brandon Smith gets ready to install a FLOVAC valve sensor on a valve body.

Below sea level

The Miles Crossing Sanitary District is fairly new, incorporated when the community decided to shift from private septic systems to a public sewer system. The decision to convert the community — home to a population of approximately 800 — was based upon several factors:

- The town's topography — situated on Youngs Bay, between the Youngs River and the Lewis and Clark River, is completely flat with elevation from 1 to 10 feet below sea level.
- Dikes are situated between properties to prevent them from going underwater during high tide or rain events.
- The high-water table was causing the area to experience a rapidly rising number of septic system failures, affecting groundwater quality.

The district opted for an vacuum sewer system versus a traditional gravity system. The latter would not have been feasible due to the depths required for installation combined with high-water table levels. The vacuum system implementation



The newly installed valve body and sensor in one of the district's 372 pit connections.

“This is especially helpful during a rain event.”

Brandon Smith

process, which cost the community approximately \$4 million, began in 2000 and was fully in service by 2010. It comprises 372 gravity pit connections (323 of these being residential), and a single pump station that receives the entire flow from 7.25 miles of vacuum mainline. From the pump station, two 75 hp pumps move the effluent 1.75 miles under Youngs Bay to the town of Astoria, Oregon, for treatment.

Not quite right

On normal, dry days, Miles Crossing would pump an average of 36,000 gallons per day; but during rain events, that would jump dramatically, sometimes by more than 150,000 gallons. Unlike a traditional system where I&I can exist between joints, cracks in manholes or other conveyance structures, a vacuum system is closed. Brandon Smith, pump station operator, and Carl Gifford, superintendent for the Miles Crossing Sanitary Sewer District, suspected stormwater was entering the system.

“One of the biggest challenges with a system like this is that not only do we not want the stormwater — the system simply cannot handle it indefinitely — but since we don’t handle our own treatment, we were sending extra effluent to Astoria that created extra costs,” Smith says. “Our job became finding out where that excess water was entering the system, and then correcting it.”

Gifford and Smith learned that when the system was put in place, contractors had taken each line that was tied into the property’s existing septic, severed it, and then

tied it into the new vacuum system. On many properties, storm drains and gutters, as well as other forms of outside drainage, had been run into the septic system. The impact of bringing all these lines into the new vacuum system — instead of just the sanitary line — was unknown to the contractors.

These extra tie-ins created an unnecessary burden on the system and the pump station operations, so they needed to be located and removed. The task of finding the sources of these I&I culprits was labor-intensive and slow, so the district began looking for a technology solution that would assist in this discovery process.

Trial and error

As a first attempt, Gifford and Smith utilized individual pit-fire counters. Each time an individual property’s vacuum pit fired, it would trigger an analog or digital display to track the number of firings. This method proved expensive and unreliable as a measurement or pinpointing technique. As they continued to research other solutions, they were contacted by FLOVAC.

FLOVAC had been well established globally in the field of successful vacuum sewer system installations and was seeking connections in the North American market. It was able to offer Miles Crossing a telemetry system that could be connected to each vacuum pit and would deliver the detailed data the district needed to help pinpoint and mitigate its I&I issue.

Each vacuum interface valve or connection has a magnet located inside of the top section of the valve body. The FLOVAC monitoring system works by attaching a special sensor to the valve body to detect the movement of this magnet. It detects each time the valve opens and closes, as well as how long each valve stays open. *(continued)*

Carl Gifford checks trends with the vacuum run times on the district’s SCADA system.



READING THE RAIN

When Miles Crossing Sanitary District Superintendent Carl Gifford and his operations team had an idea about incorporating a rain gauge into their vacuum sanitary system, they called upon FLOVAC Americas, their telemetry system provider, for input and insight. They wanted to know how much rainfall had been fired or pumped through the system, to gain a correlation between all of the system’s inflow and the amount of rain they receive.

FLOVAC was able to build a system for this data collection and tie it into the existing monitoring telemetry system. A rain gauge graphs itself

into the telemetry system, and overlays the information onto other tracked data, such as vacuum levels.

“We’re able to generate 30-day reports of when pits are firing, the levels, and overlay the rain data. When we see a big spike in a rain event on the graph and it is over the top of a spike in pit fires, we know we have additional water coming in due to the rainfall, and address it,” Gifford explains.

These extra data collection and measurement tools help the district proactively address I&I issues with precision accuracy at their source location.

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Numbers tell all

As vacuum valves tend to fire when 10 gallons of effluent have entered the sump, the volume of flows can be calculated from the number of activations. When an unusually high volume of water enters the sump, the valve will take in a larger quantity of fluid during that one cycle. The district could detect such occurrences by how long the valve stayed open. Depending on how many properties are connected to a single collection pit, they would be able to narrow down the point of infiltration to a small area.

With the installation of the FMS, monitoring and telemetry data now lets operators see what the entire system is doing in real time. It allows them to view individual homes and their pits, and provides information on how many times it has fired, and when.

“This is especially helpful during a rain event,” Smith says. “We can see average trends for a property. For example, if a home that normally fires 30 times a day during a weather event starts showing 5,000 fires instead, we know there’s a problem and can deploy immediately to the property while the rain event is still happening to see exactly what’s taking place.”

One big discovery uncovered by monitoring involved a property with a partially collapsed lateral. Although it was functioning sufficiently to serve the home, it had been crushed in some areas. Where it ran from the home under the rock driveway, it was acting like a natural storm

drain, pulling water straight from the surface into the sewer system pit. Using CCTV push cameras to inspect and document the line’s condition, the utility team was able to show the property owner the extent of the damage, its effects, and then work with them to develop a plan of action to resolve it.

Subtle adjustments

Normally, the monitoring units are connected to a transmitting antenna that sends data to the central monitoring system wirelessly. Due to the flat terrain and steel manhole covers on the pits, Miles Crossing ran conduit pipe out to a utility pedestal at the roadsides and installed the wireless telemetry equipment there. Everything works wirelessly through the latest Gateway, Bluetooth and LoRaWAN technology and is tied into the district’s SCADA system.

“We can set parameters as far as what we are asking it for, and to send us text messages when there are different alarms. This extra information is especially helpful when we are experiencing a lot of rainfall,” Smith says.

Since its installation, the system has required minimal maintenance. A yearly visual inspection of each valve pit is typically all that has been needed. Rare mishaps can occur, but — due to the very nature of the sealed system’s construction — if things happen, the pumping equipment operation and vacuum attributes make pinpointing issues quick.

Moving forward

Nearly 60% of the system has been fitted with the telemetry monitoring system, and phase two of the project, a complete system rollout, is commencing shortly.

“By retrofitting the entire system with the FMS, we will know when there’s a problem before the homeowner does,” Gifford says. The monitoring system also provides a high-level float that can alert the operators when a pit begins to have an issue. Now Gifford and Smith can be more proactive versus reactive in keeping the system in peak operating status, while cutting down on field time and hunting down overflows.

With just a little more than half the system being monitored, the district has already seen significant savings in treatment costs, Gifford says.

“The vacuum system was a great solution for this community and now with the telemetry tools, we will have a sustainable, high-performing and affordable sanitary system for our district for generations to come.” ♦

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CUTTING THE GLASS CEILING

Female utility executive works hard to attract more women to the water industry

By Ken Wysocky

As a high schooler, Doa Ross could've just as easily followed the stereotypical career path more frequently traveled by young women decades ago and become a cosmetologist.

Instead, she earned an engineering degree and now is the deputy general manager of engineering at the Las Vegas Valley Water District.

"When I walked onto the University of Nevada, Las Vegas campus for the first time, I declared my major and never changed my path," she says.

The factors that influenced her career choice — things such as job portability, competitive pay and a chance to serve a community — illustrate the buttons utility recruiters could push as they try to make water-industry careers more appealing to women. They also underscore the importance of community outreach in spreading the word to girls and young women, a message Ross never heard as a young woman.

"Unfortunately, I didn't have any guidance or influence to pursue engineering," she says. "If I had listened to my high school counselor, I would have gone to beauty school.

"But during my senior year, I took the military's vocational aptitude test and scored the highest in engineering," she continues. "That's when I started to investigate careers in engineering."

Ross, 47, went on to earn a civil-engineering degree at UNLV. After graduation, she worked at an engineering firm for two years before joining the LVVWD as an assistant water engineer in 2000.

Appealing careers

Many factors influenced her decision to become an engineer and enter the water industry, and they're items recruiters at water utilities should take to heart as they try to convince women to come aboard.

"I wanted a career that I'd be able to take anywhere in the country, or even the world," she says. "Something that didn't depend on my age, appearance, race and so forth.

"I wanted something that paid well enough to comfortably support myself and my family," she adds. "And I wanted a job that would not be replaced by a computer and that I could be proud of by giving back to the community."

Women remain underrepresented in the water industry (except for administrative/clerical positions). And while women make up nearly 47% of workers across all occupations nationwide, they account for only about 15% of the water workforce, according to a 2018 Brookings Institution report.

Nonetheless, the industry is well-positioned to improve on that dynamic, given that it faces an unprecedented wave of retirees that will leave room for women to backfill their ranks. And if the water industry is going to make headway on gender equality, it would behoove its leaders to more actively engage female mentors and reach out to younger females as early as possible, she says.

Mentors matter

Ross is doing both. "I've had mentors and I've been a mentor," she says. "There's definitely a tight relationship among the women in our organization, in both the technical and nontechnical fields, we look out for each other."

Ross also makes time to give presentations about engineering opportunities for women at the UNLV career center and at meetings of the Society for Women Engineers. The title of her presentation is *Breaking the Mold of a Traditional Engineer*.

"And every time I do so, I also bring one or more women in technical fields along so they too can speak about their experiences," she adds. "If we can show the world that women can be successful in water and wastewater industries, then we help change the mentality and mindset about what people expect engineers to look like.

"We want to show potential employees that what they see is what we're trying to promote — diversity, equality, equal pay (compared to men) and equal chances to demonstrate their skills and abilities."

Spreading the word

Ross also has volunteered at summer camps for middle-school girls interested in science, technology, engineering and math careers.

"I tell them how I became interested in this career and the path I took to get here," she explains. "It lets them know there are opportunities out there beyond what their advisers might tell them about.

"We have to change the mantra at that level ... there's not a lot of influence at the high school level to encourage young women to enter traditionally male-dominated fields."

The value of diversity can't be underestimated. If every water utility employee came from the same background and had the same education and life experiences, they'd all tend to come to the same design solutions, Ross points out.



"If I had listened to my high school counselor, I would have gone to beauty school."

Doa Ross

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.

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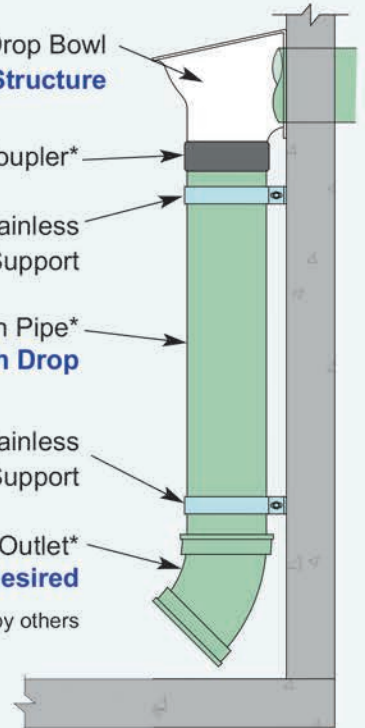
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"When you have different backgrounds and educations, you get different perspectives and innovations and break away from that we've-always-done-it-this-way mentality," she says.

"It lets them know there are opportunities out there beyond what their advisers might tell them about."

Doa Ross

Slow but steady success

Careers in the water industry should be attractive to women, for many reasons, experts opine. There's the environmental stewardship angle, which should resonate with females. Job openings should be more plentiful in the coming years in the wake of retiring, and largely male, baby boomers. Many jobs don't require expensive four-year degrees and the pay is competitive.

So what's the problem? For starters, there's the aforementioned lack of awareness of opportunities for women. Then there's the time element; changing perceptions just doesn't happen overnight, she notes.

But overall, Ross says she sees signs that gender equity is quietly happening, both at LVVWD and other agencies.

As an example, Ross points to a global conference she attended in November 2019 in Houston. Leading utilities were asked to nominate next-generation water-industry leaders and Ross was one of four future leaders chosen to speak at the conference. The topic: Envisioning the ideal water utility in the year 2050.

At the conference, she received a pleasant surprise.

"All four of the presenters were women," she says. "So I don't see myself at all as a unicorn in the industry. This is the wave of the future. We have to start looking at people for what they have to offer as opposed to what they look like.

"It's hard to bend the curve," she says. "There's no doubt it will take time. But it's happening." ♦

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KNOW YOUR PACP PRO

Make sure the people doing the work are properly certified individuals

By Sheila Joy

Since its introduction 20 years ago, NASSCO's Pipeline Assessment Certification Program has certified nearly 40,000 industry professionals in the proper identification and coding of pipe conditions.

Each of these individuals has a unique certification number identifying him or her as someone who has demonstrated a high level of understanding and knowledge of the unique PACP language. Certification brings consistency and a uniform method to properly identifying and coding conditions, structural and O&M defects, and construction or miscellaneous features. To maintain their knowledge, PACP-certified individuals must re-certify every three years.

Unfortunately, there have been occasions when people who have not successfully completed PACP have used fraudulent certification numbers, often the number of another certified individual. This should be of significant concern to everyone involved in the assessment of sewer systems since improper coding can lead to misidentified conditions, inaccurate prioritization of maintenance and repair and, ultimately, unexpected failure.

How can you help?

- First, know that companies do not receive PACP certification. If an

organization promotes its services as being "PACP-Certified" know that only individuals have received these credentials. If a certified individual leaves one company to work for another, he or she takes that certification with them.

- When hiring a PACP Pro, always confirm that the individual holds a valid certification from NASSCO by visiting www.nassco.org and using the "Search for Certified Individual" tool.
- Before the inspection begins, ask the certified individual on the job site to verify his or her identity by showing a valid photo ID that matches their certification credentials.

Sadly, some companies have sent out employees who are not PACP-certified, using a former employee's PACP certification number. This is not only illegal, it creates the potential for misidentified conditions, which can lead to disaster.

To learn more about NASSCO certification programs, please visit www.nassco.org. ♦



NASSCO

NASSCO is located at 5285 Westview Drive, Suite #202, Frederick, MD 21703; 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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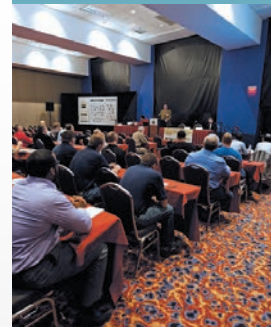
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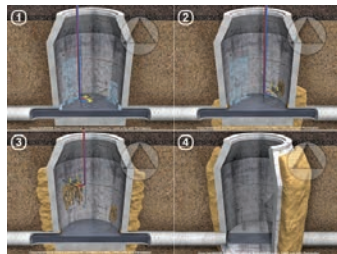
The **SPN1000** 1-inch rotary nozzle and **RSP500** rotor stator pump from **RFI Construction Products** provide air motor power for manhole rehabilitation with specialty fine-grain, pumpable mortars. The high speed of the SPN1000 nozzle atomizes the material for a smooth finish that requires very little hand troweling. The RSP500 uses a 1L3 rotor/stator (3 gpm output) to deliver the material to the rotary nozzle. It is controlled by a single hand valve for both forward and reverse operation. The pump is easily disassembled for cleanup. Air requirements for the two units are 475 cfm at 90 psi. **631-752-8899; www.rficonstructionproducts.com.**



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EPOXIES

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CPP Sprayliner MH from **Epoxytec** is designed to rehabilitate sanitary sewer collections system assets and other underground, cylindrical and/or small box structures in contact with hydrogen sulfide and in need of I&I mitigation with sealed lining. It performs in areas subject to chemical attack

and, as a seal preventing oxidation while holding back water migration, I&I and hydrostatic pressure. The material can be sprayed ultra-high-build, up to 1/4 inch per pass. Blended with reinforcing agents and various fibers, the material when cured creates reinforcement lining as a fiber-reinforced polymer, with high-strength and flexural properties for partially or fully deteriorated structures. **877-463-7699; www.epoxytec.com.**



Infrastructure Repair Systems Infragard

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Picote Solutions Dual-Color Epoxy Brush Coating System

The **Dual-Color Epoxy Brush Coating System** from **Picote Solutions** allows technicians to rehabilitate pipes from 1.25 to 12 inches for drains, sewers, water pipes, electrical conduits and heat and air-conditioning ducts by brush-casting a coating. The coating resin forms a pipe inside the original pipe that is tested, safe and environmentally friendly. The new pipe is damp-proof, corrosion-resistant and wear-resistant. It is ASTM and NSF certified (NSF/ANSI 61-5). It is a 100% solids epoxy, and the method allows for clear visual verification during the application process. Apply to small areas or all drains in multi-story buildings. The system is practical and easily fits in tight places. **219-440-1404; www.picotesolutions.com.**



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Pipe Lining Supply offers several different **Quik-Pox** working/curing time hardeners to work with a single epoxy base. Quik-Pox 15 has an adjustable work time between 10 and 50 minutes. The cure time is adjustable between 30 minutes and five hours depending on whether the crew is using ambient curing temperatures or assisting the curing with heat. Quik-Pox 30 resin has an adjustable work time of 20 minutes to two hours with a cure time, again adjustable, between 45 minutes and seven hours. Quik-Pox 60 resin features adjustable work times from 30 to 180 minutes. The cure times are adjustable between 60 minutes to 11 hours. The operator can mix any or all hardeners together to create custom work/cure schedules. These features give the installer a flexible option regarding the work times and ability to adjust those to the pipe diameters, pipe lengths, and job-specific restrictions such as access and other conditions. **888-354-6464; www.pipeliningupply.com.**



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Manhole ChimneySeal No. F-88 from **Sauereisen** is an elastomeric lining composed of fiber-reinforced, asphalt-modified urethane. It is self-priming with water absorption of 0.05%. Applied by gloved hand at 1/8-inch minimum thickness, it provides a flexible barrier or gasket seal for the prevention of water infiltration. It resists the stresses and movement associated with freeze/thaw environments while maintaining ideal elasticity/adhesion over temperature ranges from negative 30 to 250 degrees F. **412-963-0303; www.sauereisen.com.**



Sprayroq SprayWall

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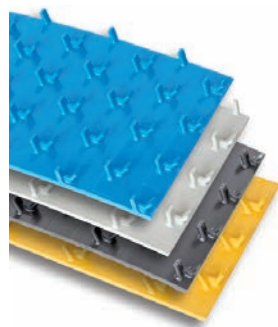
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(continued)

MANHOLE PARTS AND COMPONENTS

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Cherne Air-Loc Bladder Style Manhole Testers provide an efficient, cost-effective method of testing new, existing and rehabilitated manholes, per ASTM C 1244. The testers, supported by an aluminum brace, seal the inside diameter of the manhole at the frame or core. The pushpin rod design enables easy depth adjustment. The remote inflation and monitoring system keeps users away from the danger zone. They are available in 10 variations. **800-321-9532; www.oatey.com/brands/cherne.**



CUES Lifter Plus II

The **CUES Lifter Plus II** access cover tool remover can be rear- or front-mounted. The hydraulic tool can be used on conventional-sized covers and grates and for more challenging removal tasks. It is ideal for front-mounting on vacuum trucks; a connection to the vehicle battery is all that's required. The cover removal tool is a quick solution for stuck-in-place covers, and it prevents worker injuries. **800-327-7791; www.cuesinc.com.**



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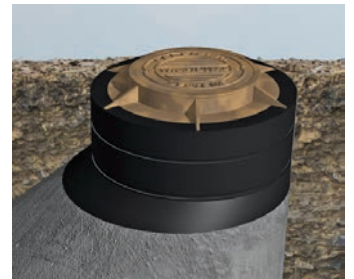
The **Spin-Jet** from **USB-USA** is a self-centering, controlled rotating nozzle that is used for cleaning lift stations, barrels and manholes prior to rehabilitation. Available in two different versions, it has driving nozzles that rotate in a 360-degree horizontal plane only. This action eliminates the need to cover the manhole during operation, allowing for constant viewing of the cleaning process. Front jets thoroughly clean any grease, sludge or mud at the bottom. **844-285-5770; www.usb-usa.com.**



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The **WrapidSeal Manhole Encapsulation System** from **CCI Piping Systems** consists of an engineered primer and a wraparound, heat-shrinkable sleeve designed to seal joints and prevent groundwater from entering a collections system. This material has a high-shrink membrane (70% stretch and 40% recovery) designed to shrink around any manhole profile. In addition, the high-tensile strength accommodates structural movement, while the tough backing resists soil stress and provides suitable abrasion resistance. It can be used for new construction or for the rehabilitation of existing manholes to control infiltration through joints and prevent deterioration, thus eliminating costly maintenance repairs and the added expense of treating groundwater. **800-867-2772; www.wrapidseal.com.**



Cretex Specialty Products Internal Chimney Seal

Cretex Specialty Products Internal Chimney Seals are mechanical, so there is no need to worry about surface adhesion or stopping active leaks prior to installation. The seals eliminate and prevent manhole chimney inflow. During wet weather, clear water enters the manhole through deteriorated and broken chimney joints, which may burden the collections system. The chimney seal has a 50-year design life and is available in four widths, allowing complete chimney coverage up to 24 vertical inches with a single seal. **800-345-3764; www.cretexseals.com. ♦**



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Problem:

“We were having problems in the city with cast iron manhole risers,” says Samir Amin, P.E., Milwaukee’s engineer in charge. “They’re usually fine, but on occasion they would slip or rattle out, and that led to car damage and claims — there was definitely room for improvement.”



Solution:

Several years ago, Amin was approached by a representative from **American Highway Products**, who demonstrated the company’s adjustable riser, the **Pivoted Turnbuckle Manhole Riser**. These sturdy galvanized steel risers feature a turnbuckle and are precisely sized to order. Using a screwdriver as a lever, the turnbuckle transmits thousands of pounds of force to the flexible rim, seating the riser into the original utility rim securely. Installation typically takes five minutes or less. And unlike risers that depend on set screws or other mechanisms for adjustment, the pivoted turnbuckle riser connects tightly around its entire circumference, like a pressed-in bearing.

RESULT:

Costs didn’t go up. “Risers aren’t really a big item in most of our mill-and-fill bids, and I didn’t notice any significant increase in costs due to the required use of adjustable risers,” Amin says. By now, close to 1,000 are installed. Milwaukee has emphasized milling and repaving in recent years, and Amin estimates that between 200 to 300 risers are installed annually. And in all that time, none have rattled out, or failed in any way. “They’re a successful product, and we’re very happy with them,” says Amin. “They cost a bit more compared to cast iron risers, but now we have no worries about them coming loose, and that means a lot.” **888-272-2397; www.ahpl.com.**

Composite covers contribute to watertight system

Problem:

Fulton County (Georgia) Public Works recently began a major sewer rehabilitation initiative that was highlighted on Fulton Today TV news. Roy Barnes, deputy director of Public Works, explains that the utility was renewing the manholes with fiberglass inserts while sealing the manhole chimney with watertight HDPE Ladtech grade rings, but it sought composite manhole covers.



Solution:

Composite covers from **Composite Access Products (CAP)** were specified to achieve the first watertight system in the state of Georgia. “The CAP composite manhole cover and frame make a more tightly mated assembly because composites remove the corrosion that fuses cover to frame,” says Chad Nunnery, president of CAP. “Also, because the compression-molded composites have one mold for every cover and frame, the CAP system eliminates the higher part-to-part variation inherent in a different sand cast for each iron cover and each frame.” The noncorrosive, close-fit CAP cover is gasketed and bolted down, and the cover with frame assembly has been shown to hold 20 inches of water submerged with 0.00 gpm infiltration.

RESULT:

“The major benefit is we are now producing watertight manholes that can even be submerged,” Barnes says. **844-344-2271; www.justcapthat.com.**

Spincasters reduce manhole repair time by 50%

Problem:

Manhole rehabilitation in southern Texas is not for the faint of heart. Thousands of manholes and an aged sewer system create complexities beyond a typical rehab project, including infiltration concerns and even structural collapses, all while navigating inside confined spaces.



Solution:

For National Works and its fleet of **HyFlex Slinger** spincasters and **30GM** pump and mixer systems, manhole rehabilitation is just another day at the office. Chris Olmstead, operations manager at National Works, and his team put HyFlex equipment in the forefront of planning to meet timeline and productivity goals. The spincaster applies a specialty cementitious lining called SewperCoat to manholes with limited entry time, increasing efficiency through repetition while eliminating errors found with traditional manual application methods. Approximately 50% of the work gets completed before a contractor enters the manhole for hand finishing/troweling. Olmstead and his team map out subproject areas when managing geographically expansive projects, using a fabricated system for manholes grouped in a close proximity. For remote locations, portability and the small footprint of the Slinger and 30GM allow equipment to be within a couple hundred feet of the manhole to pump material, which isn’t possible with other equipment. This process ensures evenly spread materials, elimination of confined-space issues, and improved safety.

RESULT:

National Works is receiving high job performance ratings and crew satisfaction with the HyFlex Slinger and 30GM equipment. Project time is significantly reduced. Consistency and safety factors are greatly improved. Utilizing a fleet of high-quality equipment ensures that all projects stay on track. **866-849-6246; www.hyflexcorp.com.**

Mortar effectively used to rehabilitate manholes

Problem:

The city of Alameda, California, needed to rehabilitate 17 existing manholes. Twelve of the manholes were brick-and-mortar construction that required rehabilitation from deterioration due to the corrosive hydrogen sulfide environment to which they had been exposed. While the brick showed only minor deterioration, the Portland cement-based mortar joints were severely corroded.



Solution:

These 12 manholes were rehabilitated using **Megamix II with Bio-San** from **Xypex** as an over-coating layer to repoint the joints as well as coat the entire surface. Megamix II with Bio-San is a high-strength, chemically resistant thick-build repair mortar that is enhanced with an antimicrobial crystalline technology. The other five new manholes were new precast and were not expected to encounter the equivalent corrosive hydrogen sulfide environment, so as a protective measure, two coats of Xypex Concentrate were utilized. The 12 brick-and-mortar manholes were coated to a thickness of 1 to 1 1/2 inches with Megamix II with Bio-San to provide a smooth, hard, chemically resistant inner surface with the added benefit of antimicrobial technology to stop the formation of acid producing bacteria.

RESULT:

This protective resurfacing effectively rehabilitated and protected the manholes to extend the service life of these important pieces of municipal infrastructure. **604-273-5265; www.xypex.com.** ♦

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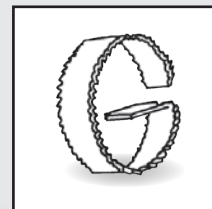
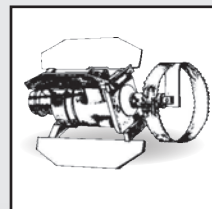
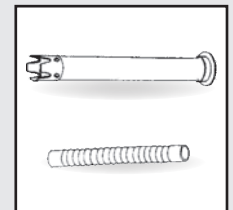
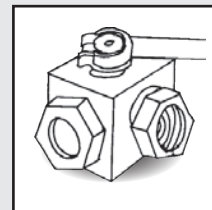
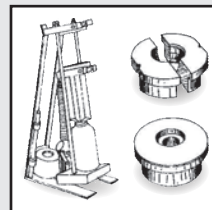
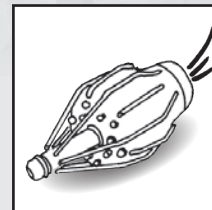
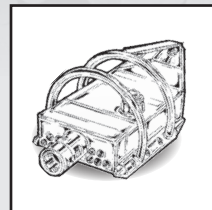
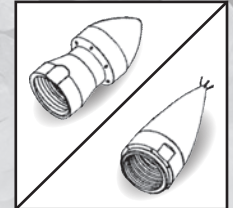
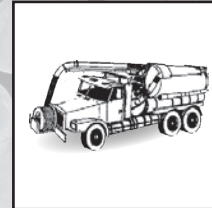
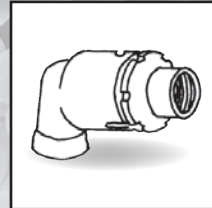
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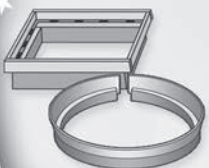
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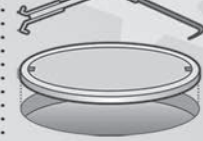
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Product Spotlight

Super Products reinvents signature combo truck series

By *Tim Dobbins*

Combination sewer cleaners are solid investments for municipal utilities because they are versatile and efficient.

In 2021, Super Products reinvented many aspects of its Camel Max Series combination sewer cleaners, including the Camel 1200 Dump, Eject and Wastewater Recycle models with the aim of improving efficiency for operators in the field. These models are now all standard with a high-dump subframe.

“The Camel Max Series is effective in all industries. With the addition of the air to hydraulic oil cooler, the Camel is at home being used as a vacuum truck, hydrovac or a sewer cleaner,” says Mike Drott, vice president of municipal sales for Super Products. “You could call it the Swiss Army knife of the vacuum industry.”

The Camel 1200 Max Series Eject and Wastewater Recycle models feature an ejector plate exclusive to Super Products trucks that was built to deliver a safe and fast way to unload. The ejector plate pushes material out, leaving only residue in the body, which can be rinsed with the onboard flusher system.

“The ejector plate in the Camel can dewater the load before leaving the work site, thus making the unit safer to drive. More payload to the dump site and with less water keeps the dump site much cleaner,” Drott says. “With the ejector unloading, we take cleanup from hours to minutes.”



The new version of the 1200 model features a high-dump subframe, allowing users of the Dump model to empty into a 42-inch-high open-top roll-off container, and the Eject model to dump into a 48-inch container. Utilizing the high-dump subframe takes away the need for body-lifting mechanisms or ramps and limits the chance of tipping.

The 1200 Max Series Wastewater Recycle model is capable of cleaning nearly 3,000 feet of sewer pipe per day without using freshwater because of its recycling technology, and all 1200s have the option for a hydroexcavation package so operators can jet, vacuum and excavate all from the same truck.

“When Super Products designs or makes improvements to any of our products, it all starts with the voice of our customers and dealer partners,” Drott says. “Then the engineering and design phase comes in.”

Each Camel is built around a modular platform where almost every option can be bolted on after the unit is delivered, or on a stock unit for quick delivery. Units are built shorter and more compact so they can be used in cities with low bridges and for traveling in congested streets. **800-837-9711; www.superproductsllc.com.**

SPECIAL REPORT



DeZURIK's APCO Brand Valves

DeZURIK's APCO Swing Check Valves prevent the backflow of stormwater by closing before flow reversal, preventing slam and water hammer. The designs meet or exceed the current revision of AWWA standard C508. The APCO ASV air vacuum valves allow large volumes of air to be exhausted from or admitted into a pipeline as it is being filled or drained. Four of the 60-inch APCO brand CVS-6000 swing check valves and ASV air vacuum valves are installed at the Louis Armstrong New Orleans Airport Pump Station. This pump station directs stormwater away from the airport to protect against flooding damage during tropical storms. The valves are part of the extensive post-Katrina infrastructure modifications that are critical to the protection of the City of New Orleans and its transportation system. DeZURIK has extensive experience manufacturing large valves for water distribution, water treatment, wastewater collections and wastewater treatment. **320-259-2000; www.dezurik.com.**

Vermeer roller cone hole openers

Vermeer roller cone hole openers are available in diameters of 8 to 24 inches in 2-inch increments and include a range of customizable options. The cutters feature metal-faced seals similar in style to what is on a dozer or excavator rather than conventional rubber seals. The openers are also built with a precision machining manufacturing process that allows the tool to have equal loading on each cutter. With a wide range of sizes and centralizer options, as well as two different cutter options for hard and medium hard rock and a multitude of customizable options, Vermeer roller cone hole openers are equipped to meet the specific needs of any job site. **800-837-6337; www.vermeer.com.**



Aries Industries TrailBlazer enclosure

Aries Industries introduced the TrailBlazer operations and transport enclosure, a self-contained equipment housing that can get critical equipment into tight work sites. The TrailBlazer mounts onto a pickup truck, all-terrain vehicle or trailer, allowing pipeline inspection equipment to be brought into locations too small for larger vehicles. The lightweight, lockable enclosure can house either an Aries Industries Mobile Pathfinder System or Master Controller System, both ready to send remote-control inspection robots into pipes and record interior conditions with video cameras. It has a weatherproof and corrosion-proof shell to protect and transport the control systems. Inside are two 250-pound-capacity drawers to securely store tractors, cameras and accessories. Two installed monitor options are available: one 17-inch sunlight-readable screen, or two 15-inch sunlight-readable units. The TrailBlazer has four 120-volt outlets and two USB outlets. **800-234-7205; www.ariesindustries.com.**



Watson-Marlow Bredel heavy-duty hose pumps

Watson-Marlow Fluid Technology Group's Bredel heavy-duty hose pumps are a reliable and easy-to-maintain solution for handling the viscous slurries and grit-filled sludge in wastewater treatment plants. Unlike diaphragm, rotary lobe and PC pumps, the peristaltic design of Bredel hose pumps contains no moving parts that come into contact with the product, and no seals, ball-checks, diaphragms, glands, immersed rotors, stators or pistons to leak, clog, corrode or replace. Bredel hose pumps also remove the need for ancillary equipment such as dry-run protection, seal water flush systems and inline check valves. A simple hose change takes only minutes and can be performed in situ without special tools or skilled personnel. The hose pumps are dry-running and self-priming, and allow no slippage, for true positive displacement to provide accurate and repeatable metering. **800-282-8823; www.watson-marlow.net.**



Hawk Measurement Systems laser level products

Hawk Measurement Systems' OptioLaser L100 and L200 laser level transmitters are ideal for level, distance and position measurement of solid and liquid surfaces. The laser has a very narrow beam that can measure long and short distances at virtually any angle. They are completely stainless steel and extremely rugged, built for the harshest of environments. The transmitters are fully programmable and include simple-to-use software, and can be configured for either distance or level measurement. **888-429-5538; www.hawkmeasurement.com.**



SmartCover H2S monitoring mobile app

The H2S monitoring app from SmartCover has a range of 0 to 1,000 ppm and 1 ppm resolution. Adjustable alarm settings allow for faster response when high H2S levels are detected, and calibrated sensors ship automatically every 90 days. No confined-space installation with manhole covers, lift stations and treatment plant biofilters. The app can overlay H2S with level, flow or rain data. **760-291-1980; www.smartcoversystems.com.**



Vac-Con VJ375 and VJ750 sewer jet models

Vac-Con recently released its next generation trailer-mounted sewer jet units under its VecJet portfolio. The VJ375 and VJ750 feature a low-profile silhouette and various configurations. A choice of a single-axle, 375-gallon water capacity or a tandem-axle, 750-gallon water capacity, is available with either gas or diesel engine. Some of the standard features include a rotating hose reel with 500 feet of sewer hose, hydraulic feed and retract with manual swivel, and an electronic, weather-proof control panel. Models are available at 18 gpm at 4,000 psi, 30 gpm at 3,000 psi, or 40 gpm at 2,000 psi with Tier 4 diesel engines. Other options include a range of gas engine configurations, wireless remote, anti-freeze tank system for cold weather use and various lighting options. **904-284-4200; www.vac-con.com. ♦**



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Nidec Motor Corp. introduces virtual program for motor testing

Nidec Motor Corp. launched a virtual test service that enables customers to remotely witness and monitor motor testing that is being done at NMC's Mena, Arkansas, manufacturing facility. The service, which can eliminate the need for an on-site inspection, provides original equipment manufacturers and end-users with a safe, convenient and economical way to validate that a product is being manufactured to specifications, view performance results and receive additional technical support.

Core & Main expands into West Texas

Core & Main reports it closed on its previously announced agreement to acquire substantially all of the assets of Triple T Pipe & Supply, of Lubbock, Texas. Financial terms were not disclosed. The team from Triple T will continue to be based in Lubbock and will move into a new, larger facility to enhance their support of their existing and new customers in West Texas.

WJTA releases second edition of best practices

The WaterJet Technology Association released the second edition of Industry Best Practices for the Use of High Pressure Waterjetting Equipment (WJTA Orange Book). The 2021 edition includes extensive revisions and updates to safety practices for the use of manual and robotic high-pressure waterjetting equipment. New, detailed full-color images and photographs have been added to illustrate safety practices, equipment, operations and personal protective equipment.

Asahi/America welcomes new operations VP

Asahi/America announced the addition of Andrew Meschisen to its executive management team. Meschisen joined Asahi/America as vice president of operations and materials where he will oversee the company's operations and manufacturing, materials and supply chain, quality assurance, warehousing and facility maintenance.



Andrew Meschisen

NozzTeq under new management

NozzTeq is under new management at a new location in Peru, Illinois. The company will continue to offer its long-lasting cleaning nozzles and Lumberjack cutters, in addition to providing service.

Sedaru acquired by Aquatic Informatics

Sedaru was acquired by Aquatic Informatics and will join Danaher's Water Quality platform. Headquartered in San Dimas, California, Sedaru's turnkey SaaS application for critical water infrastructure asset management and real-time monitoring of water system operations streamlines workflows across the utility enterprise.

Rajan Ray takes digital leadership role at CDM Smith

CDM Smith announced that Rajan Ray joined the firm as a global strategy lead for digital solutions. Ray has more than two decades of experience in the development, commercialization and implementation of advanced digital solutions in the water industry. Prior to CDM Smith, Ray was the global director of product marketing at Innovyze, where he and his team developed and supported the go-to-market strategy for the company's entire software portfolio, including the company's first foray into artificial intelligence and machine learning.

Itron wins safety innovation award

Itron has been selected as the winner of the Public Safety Innovation of the Year award for the third consecutive year in the annual IoT Breakthrough Awards program. The award recognizes the IoT-based wastewater monitoring solution developed through a collaboration among Miami-Dade County Water and Sewer Department, Itron, Utility Systems Science and Software and the Avanti Co.

Woolpert's Danielle Meggyesy promoted to project manager

Woolpert's Danielle Meggyesy, P.E., was promoted to project manager in the firm's energy market. She has been with Woolpert since late 2019 and works out of the firm's Columbus, Ohio, office.

AVT launches animation on insertion valve technology

Advanced Valve Technologies launched a new animation that takes viewers through the full process of installing AVT's insertion-type EZ Valve. With the global lockdown, face-to-face demonstrations proved challenging, so the AVT team created the detailed animation video to show the process.

Mueller awarded contract for AMI deployment

California's Calaveras County Water District selected Mueller Systems to deploy an advanced metering infrastructure network covering 1,000 square miles with 13,000 AMI endpoints. The project will replace the majority of the district's meters and add communication capabilities to all meters. ♦

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PEOPLE/AWARDS

Freese and Nichols hired **Jennifer Miller** as its stormwater services leader in Atlanta. Miller has spent more than 20 years managing and supporting a variety of stormwater, water quality, permitting and water management projects. She previously served as a technical lead for Georgia's Surface Water Availability Assessment.

The **City of Georgetown** (South Carolina) received a grant award for stormwater projects in the Historic District from the U.S. Department of Commerce's Economic Development Administration. The EDA awarded the city a \$3,365,409 grant with Georgetown County providing the required local match of \$841,353. The projects will help to mitigate flooding in the city's core commercial district.

Prince William County (Virginia) arborist **Julie Flanagan** was recognized by the American Public Works Association Mid-Atlantic Chapter for her work in making a stormwater management pond at Innovation Park into an improved, welcoming habitat for aquatic and avian wildlife.

The Illinois Association of Floodplain and Stormwater Managers presented **DuPage County** with the 2021 Mitigation Award. The award recognizes individuals and communities who encourage flood hazard reduction through various mitigation efforts, including buyout programs, retrofitting, planning and proactive projects. IAFSM recognized DuPage's stormwater management and

community services departments for their efforts to mitigate flooding county-wide using a nearly \$32 million grant from the U.S. Department of Housing and Urban Development. ♦

CALENDAR

June 7-9

Municipal Wet Weather Stormwater Conference, jointly held by International Erosion Control Association Region One and Southeast IECA Chapter; Marriott Hotel, Huntsville, Alabama. Visit ieca.org.

June 7-11

Environmental and Water Resources Institute of the American Society of Civil Engineers World Environmental and Water Resources Congress, event held virtually. Visit ewricongress.org.

June 14-17

American Water Works Association ACE21 Conference, event held virtually. Visit awwa.org.

July 12-16

American Society of Agricultural and Biological Engineers Annual International Meeting, event held virtually. Visit asabe.org.

July 19-21

American Water Resources Association Summer Specialty Conference, event held virtually. Visit awra.org.

June 22-23

Water Environment Federation Stormwater Summit 2021, event held virtually. Visit wef.org.

Aug. 29-Sept. 1

American Public Works Association Public Works Expo (PWX), America's Center, St. Louis. Visit apwa.net.

Sept. 13-16

StormCon Milwaukee and WaterPro Conference, Wisconsin Center, Milwaukee (parallel events being held on same days and location). Visit stormcon.com or waterproconference.org.

Oct. 6-9

American Society of Civil Engineers 2021 Convention, event held virtually. Visit asce.org.

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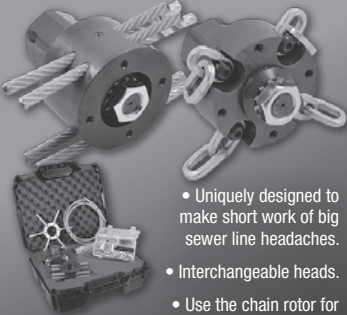
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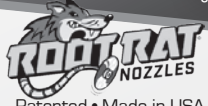


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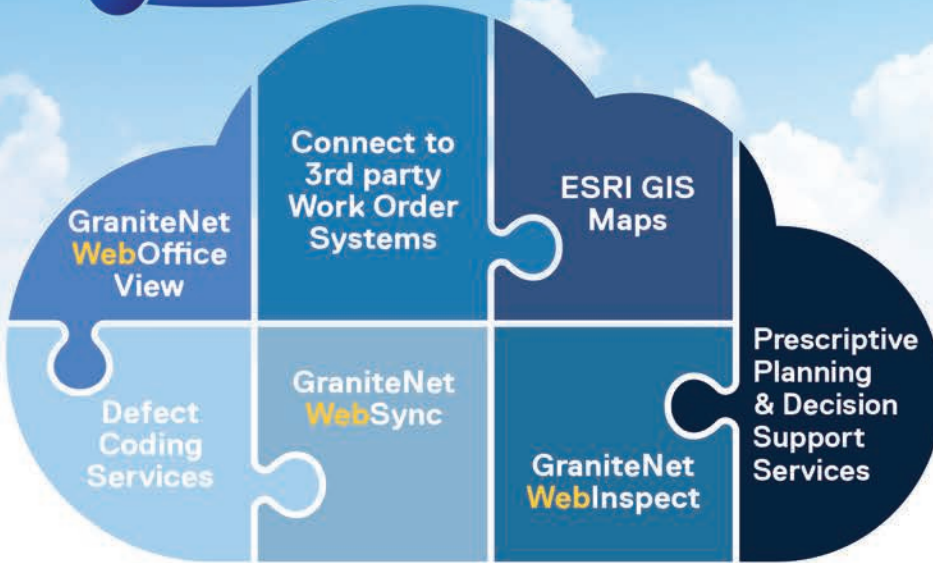
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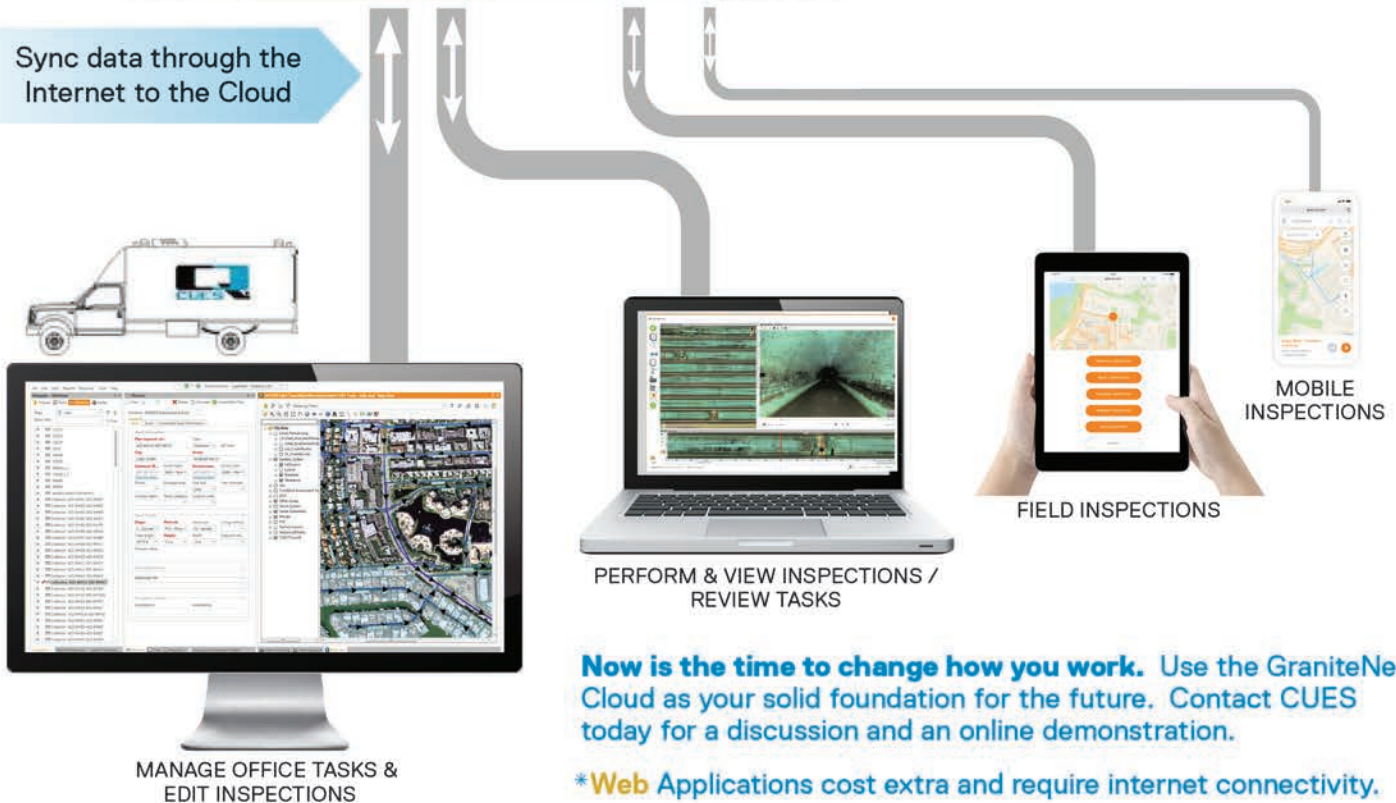
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