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> Dr. Sheeba Thomas Senior Technical Engineer San Antonio River Authority

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#### PRODUCT FOCUS: PIPELINE REHABILITATION AND RELINING







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ON THE COVER: San Antonio River Authority (SARA) Senior Technical Engineer Dr. Sheeba Thomas helped the Authority win a WEF Excellence Award for its Water Quality Master Planning Project. (Photography by Mark Greenberg)









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# THE ONLY MEASURE THAT MATTERS

Luke Laggis

There's always more to do, but moving your utilities forward is what really counts

orty-seven years ago next month I was born, the third (and last) child of Marilyn and John Laggis.

I have an older brother who's a teacher, and my sister - the oldest - has had a long and successful career in sales. I think I've known since early in high school that whatever I did would probably somehow involve writing. But I can assure you I never had a long-range plan to be editor of a magazine for the sewer and water industry. That was a just a pleasant surprise along the way.

I'm sure there are a few of you who knew as children that you'd one day

# 

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ntoSense. Inc 877-747-3245 sales@infosense.com • www.infosense.com work on sewer and water systems, but I doubt that's the case for many of you. The fact that you didn't make it to the NFL, become an astronaut or follow in the footsteps of Edward Van Halen doesn't take away from any of the achievements in your life. I haven't written a book yet; I'm the editor of MSW, not Rolling Stone. But I like putting this magazine together. I like this industry. And I'm proud of the fact that I have a successful career doing something I enjoy. That's the only measure that matters to me.

#### We've featured a lot of utilities in this magazine. Most have accomplished great things, but none have completed their work.

I think the question "What did you want to be when you were younger?" is a loaded one. Almost any way you answer frames your present career as a letdown. The better question, in my opinion, is what do you want to be a few years from now? How do you want to build on what you've done to this point?

It's the same for your utilities. What benchmarks are you trying to meet? You've no doubt done some good work, but maybe you still have some lead service lines in the ground (check out the feature on Louisville Water in this issue) or stretches of failing sewer line. Maybe you've made great strides in reducing water loss but aren't quite where you want to be yet. Or maybe you have a seemingly insurmountable backlog of work, but you're putting together a 10-year plan to address deficiencies. Sometimes where you're at isn't as important as where you're headed.

We've featured a lot of utilities in this magazine. Most have accomplished great things, but none have completed their work. There's always more to do, and I think if you always keep that mentality it'll serve you and your utilities well. Appreciate today, of course, because it's not just a preamble to tomorrow. It has an impact.

You're in a position that's as important as it gets. Clean water and proper sanitation are bedrocks of community health. Emergency room doctors will be the subjects of more TV shows, but they don't affect the health of as many people as you do on a daily basis. That's why every day is so important in this industry.

It doesn't matter what you wanted to be as a kid. It matters what you are now, and where you and your utilities are headed is even more important. 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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#### MAINTENANCE TIPS Utility Locating Equipment

Electromagnetic locating tools don't require the level of upkeep that other machines need, but there are several good practices you should think about to help keep your equipment in top shape. This online article offers some tips for keeping your locating tools in good working order. **mswmag.com/featured** 



#### **Utility Reaches Thousands of Students**

COVID-19 hasn't stopped the flow of wastewater into treatment plants, and it shouldn't stop the stream of water education either. The Prince William County (Virginia) Service Authority now offers a new opportunity for kids to learn about the water/ wastewater world via virtual models, activities and interactive presentations on its online learning hub H2Go Kids. **mswmag.com/featured** 



# **Winter Pipe Lining**

With a few slight modifications, you should have no problems performing your typical pipe lining work during the cold-weather months. In this online exclusive article, industry expert John Heisler offers some tips to get around the obstacles to lining pipes in the winter season. **mswmag.com/featured** 



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# LOUISVILLE GOES LEAD-FREE

Water utility completes 50-year effort to replace 500 miles of lead water service lines

By Ken Wysocky

There are an estimated 6.1 million lead water service lines still in use in the United States. But none of them are in Louisville, Kentucky, thanks to the recent completion of a long-running service-line replacement program run by the Louisville Water Co. — and completed five years ahead of schedule.

As such, Louisville is one of the first large cities in the country to successfully replace all of its known lead water service lines — 74,000 in all — with copper pipes. The original lines were installed between 1860 and 1936, when the use of lead pipes was commonplace.

The utility delivers an average of 120 million gallons of drinking water daily from the Ohio River to nearly 1 million people in metropolitan Louisville and surrounding counties, as well as thousands of businesses.

"This is a proud day for our community and our employees," Spencer Bruce, the utility's president and chief executive officer, noted when the replacement program concluded last July. "The work to replace the lead service lines started with company leaders who preceded me. It's been a long road, but I'm proud to carry out their vision."

Louisville Mayor Greg Fischer noted that removing lead pipes from the city's water system is something that only a handful of cities have accomplished and shows how Louisville Water distinguishes itself nationally as a best-in-class water utility.

"This achievement by Louisville Water Co. is a great example of how our city innovates," he said.



#### **Big price tag**

It cost more than \$50 million and took about 50 years to replace roughly 500 miles of service lines — running from water mains up to property lines — with 3/4-inch-diameter copper pipes. The utility funded the project with municipal bonds paid off by revenue from user fees.

"The money came from our capital-projects budget," says Jim Grunow, the utility's former director of engineering and now director of strategic projects. "We raise our rates about 3% to 4% annually ... so we never had to raise rates just to pay for replacing the lead service."

The annual costs ranged from around \$500,000 to \$5 million during peak replacement years.

Before the risks of lead exposure were well known, lead pipes were widely used in water supply systems because of their malleability. In fact, the word "plumbing" derives from "plumbum," which is the Latin word for lead.

Even after studies revealed the health risks associated with lead, the use of lead pipes, leadbased solders and lead plumbing components continued through the mid-1980s. Lead pipes and solders finally were banned from use in new plumbing systems in 1986 when Congress amended the Safe Drinking Water Act. But cities have been slow to replace them, partly because of the exorbitant price tag — up to \$30 billion, by some estimates.

#### **Decades of work**

Louisville Water started replacing lead service lines in the 1970s, either as they were discovered during routine work or while repairing service line breaks. The lead lines were concentrated primarily in older neighborhoods established before the 1930s, Grunow says.

In the ensuing years, replacement efforts escalated to replacing lines during water-main replacement projects, where any service lines connected to the mains were replaced, and then to an even more aggressive block-by-block replacement strategy that began in the 1990s.

"We would identify 100 services along a stretch of road for two or three blocks, for example, and replace all the service lines attached to the mains in those areas," Grunow explains. "That allowed contractors to work more efficiently as well as provide us with better pricing.

"Plus we didn't want to stay in just one neighborhood because of the inconveniences posed by construction," he continues. "As the program progressed, the services we replaced became more spread out until it was just one or two here and there as we tied up loose ends."

The utility used 10 different independent contractors to perform about 65% of the line replacements, but only from the water mains to property lines, Grunow notes. The other 35% was replaced

by in-house crews belonging to Local Union 1683 of the

#### PROFILE: Louisville Water Co.

**SERVICE AREA:** About 1,000 square miles in Jefferson County and six surrounding counties

#### WATER INFRASTRUCTURE:

More than 4,200 miles of water mains, ranging from 6 to 60 inches in diameter

#### **DAILY OUTPUT:**

More than 121 million gallons, sourced from the Ohio River

**EMPLOYEES:** 465

WEBSITE: www.louisvillewater.com



American Federation of State, County and Municipal Employees, AFL-CIO.

For a brief time, the utility considered lining the lead service lines. But a pilot project performed about 12 years ago raised some concerns, so the utility stuck with its original plan to replace lines with copper pipes.

#### **Difficulties emerge**

Of course, challenges cropped up along the

way, as they do with any major public works project. For example, utility officials discovered that replacing the lines would release small lead particles that could taint customers' water.

The solution? The utility asked homeowners and businesses to flush their water systems for one hour after service lines were replaced, a process that must include opening every faucet in a home or building. That isn't as easy as it sounds, however, especially when customers aren't home when the work is completed. In the end, the utility adopted a standard protocol: If property owners weren't home when work was completed, the water to their properties would remain shut off.

In addition, inspectors would leave a postcard instructing the owners to call the utility to restore water service — and then also receive detailed flushing instructions, says Kelley Dearing-Smith, vice president of communications and marketing.

"It was a logistical nightmare at times," she says. "But for the most part, it was effective."

To compensate customers for running their water for an hour, the utility provided a \$10 credit on their water/sewer bill, Dearing-Smith adds.

The utility also received pushback from some property owners who were concerned about the work potentially damaging frontyard gardens, retaining walls, patios and the like. In those cases, the utility accommodated property owners as best it could by using technology such as vacuum excavation, which allowed them to excavate more "surgically," Grunow explains.

#### **Keys to success**

Several factors contributed to the program's success. Chief among them was decades of planning and leadership from key former managers and executives, Grunow says.

"Visionary leadership at Louisville Water that dates back decades helped our lead service-line replacement program succeed," he notes. "The leadership from our boards of directors, presidents, engineers, scientists, communicators and planners laid a foundation for water quality that continues today.

#### LOTS OF MOVING PIECES

To successfully take on a decades-long project as immense as replacing 74,000 service lines — about 500 miles in all — the Louisville Water Co. had to do much more than just hire contractors to break up pavement, excavate and replace the lead lines with copper pipes.

Behind the scenes, a lot of moving pieces were in play, including development of comprehensive public outreach and education programs, water-quality testing and maintaining good relationships with local health officials, says Jim Grunow, the utility's director of strategic projects.

A key component was a comprehensive public-outreach program, developed by the utility's communications officials. The program was aimed at educating residents about the project and keeping them updated about major developments.

"One thing we learned is that engineers tend to write up long documents with single-spaced lines about what customers needed to do," he points out. "But residents would toss them in trashcans.

"So our communications people created pieces that use pictures and illustrations that tell the story in a better and more engaging way," he explains. "We also sent out notices followed by a reminder postcard regarding flushing their water systems for an hour, then five minutes a day for 30 days.

"It really helps when you make it a comprehensive communications program," he adds.

The engaging communication pieces were helpful in getting people to flush their systems for such a long time, especially since it's so ingrained in people's minds to not let water run.

"It was hard to convince people to run their water for that long because they don't like to waste water," says Kelley Dearing-Smith, the utility's vice president of communications and marketing.

Efforts by the utility's water-quality division, which runs water tests, among other things, also were instrumental to the project's success, Grunow says.

"Among many other things, the water-quality group did some early research on water-system flushing about 20 years ago that helped us determine that one hour of flushing was sufficient," he points out.

A solid relationship and support from local health department officials also helped, Dearing-Smith says. To foster that relationship, utility officials regularly met with staff and leaders of the Louisville Metro Department of Public Health and Wellness and continue to do so.

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"Leadership had to be plugged in to make this project a priority," he continues. "We've had multiple presidents who took up the mantle, set goals and pursued them. It all starts with leadership setting goals to get the lead out by 2025 and making the financial commitments necessary to support that goal."

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More specifically, Grunow gives credit for the program's success to former employees like Keith Coombs, infrastructure planning manager; and John Huber, Greg Heitzman, Jim Brammell and Spencer Bruce, who each served as chief engineers and eventually as president. He also credits current employees such as Tim Kraus, chief engineer; Daniel Tegene, engineering manager; and Denise Aaron and Jamie Long, engineers, as instrumental players in achieving the long-sought milestone.

#### Not quite finished

Grunow says he's proud of the utility's milestone accomplishment, but says he can't take much credit for it. "To be honest, I just carried out what a lot of other people started and implemented," he says.

And while the bulk of the line replacement program now is finished, one component remains on the project's punch-list: The replacement of about 1,800 lead service lines that run from property lines to homes and buildings, plus about 2,000 galvanized service lines that were once connected to a lead line, he says. Property owners are responsible for replacing those lines, which generally run anywhere from 10 to 30 feet long, Grunow says.

"The galvanized lines need to be replaced, too, because they corrode, which creates scale," he explains. "Lead particles can lodge in the scale and get released over time."

To encourage property owners to replace their lead lines, the utility will pay 50 percent of the cost, up to \$1,500. A licensed plumber must perform the work. Customers who can't afford to pay the balance and meet certain criteria are eligible for financial assistance from the Louisville Water Foundation, a charitable, nonprofit arm of the utility.

Most line replacements typically cost less than \$3,000 because they're primarily found in older parts of the city, where yards are smaller and service lines subsequently are shorter, he says.

In some cases, the utility's funding program will help property owners defray the cost of replacing galvanized pipes, too, Grunow says.

"We finished our part, so now we have to help residents finish their part of the job. We still have to keep encouraging them to get the lead out." ◆



A crew member tightens a new copper line connection outside a residence where a lead service line is being replaced.

# **BETTER MOUSETRAPS**

# ANGLING FOR A CONNECTION

Adjustable coupling makes short work of joining misaligned pipes

By Ken Wysocky

From rerouting old water pipes to connect with newly laid lines or replacing things like underground water meters and valves, it's a fact of life that underground pipes don't always align perfectly. In many cases, the only question at that point is how much excavation will be required to give pipes enough play to nudge them into alignment.

But at the Cumberland Water Department in the city of Cumberland, Maryland, misaligned pipes are no longer an expensive, time-consuming issue, thanks to HYMAX SwivelJoint fittings, says Marty Watts, assistant superintendent.

The utility has installed six SwivelJoints since early 2020 and Watts estimates they've saved the city tens of thousands of dollars in labor costs. They also help the utility provide better customer service because water outages don't last as long, which reduces stress on the utility's staff.

"Water outages have a trickle-down effect, from the guys out in the field all the way to our office, where people handle all the phone-call complaints from customers," Watts explains. "The SwivelJoints help everybody in our department out a little bit. They've come in quite handy for us.

"They definitely put a lot of thought and ingenuity into this coupling in order to make our lives in the water business just a little bit easier," he adds.

The Cumberland water utility has about 10,000 customers. The water system includes roughly 180 miles of pipe, ranging in size from 2-inch-diameter service lines to 36-inch transmission lines. The pipes are made of cast iron, ductile iron, concrete, copper and plastic.

"It's an eclectic mixture," Watts says.

#### **Flexible connection**

Made by Krausz Industries, the SwivelJoint can connect two pipes at any angle from zero to 90 degrees. It can accommodate pipes from 4, 6, 8, 10 and 12 inches in diameter and can join pipes made of metal or plastic.

As its name implies, one of the SwivelJoint's two stab-fit couplings rotates. In a nutshell, the installer attaches the fixed end of the coupling to one of the pipe ends until it meets the minimum stab depth (indicated on the product's label), then swivels the other coupling until it aligns and can be slid onto the end of the other pipe.

After that, installers must use a torque wrench to tighten a central locking bolt to the correct torque (again, provided on the product's label), then

#### BETTER MOUSETRAPS

PRODUCT: HYMAX SwivelJoint

MANUFACTURER: Krausz Industries 855-457-2879 www.krausz.com

**APPLICATION:** Coupling for aligning pipes at irregular angles

#### **BENEFITS:**

Faster pipeline installs, less manpower, reduced labor costs, shorter water outages

#### USER:

City of Cumberland Water Department, Cumberland, Maryland



While trying to install a new meter in an underground concrete vault, Cumberland (Maryland) Water Department employees found the line coming out of the vault was offset from the feeder line. An old coupling, fashioned from poured lead, had been used to correct the misalignment many years ago.

the two other bolts. Then they need to recharge the line and check for leaks.

Gripping teeth in the couplings, each of which feature a hydraulically assisted gasket with two-stage sealing, grab onto the pipe ends and prevent



The SwivelJoint can connect two pipes at any angle from zero to 90 degrees and can accommodate metal or plastic pipes from 4 to 12 inches in diameter.

them from sliding. In addition, a radial gripping system prevents pipe motion.

The swivel joint allows for 4 degrees of deflection per coupling, which helps it withstand shifting soils. In addition, it can even adapt to pipes out-of-round by up to 0.16 inches, as well as withstand working temperatures as low as negative 20 degrees and as high as 125 degrees.

"Installation is as simple as simple can get," Watts says. "You can show someone how to install one in less than 10 minutes. Anyone who can tighten a wrench can install one."

#### Labor-saving device

A recent project underscores the SwivelJoint's value. While trying to install a new meter in an underground concrete vault, city employees found the line coming out of the vault from the meter was offset from the feeder line. An old coupling, fashioned from poured lead, had been used to correct the misalignment years and years ago, Watts explained.

#### "You can show someone how to install one in less than 10 minutes. Anyone who can tighten a wrench can install one."

#### **Marty Watts**

Connecting any new pipes at this unusual, offset angle would've been tricky because there was little room to add extra piping within the vault, and the pipe that went through the vault wall could not be shifted. As such, aligning the pipes would require manipulating the feeder pipe. That, in turn, would require additional excavation around the feeder pipe in order to give workers enough play to realign the two pipes and install a new coupling, Watts says.

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# **BETTER MOUSETRAPS**

But that's where the SwivelJoint came in.

"Instead of having to expose, say, 15 to 20 feet of pipe, we only had to expose 6 to 8 feet," he says. "We would've needed a day of prep time and then would've had to shut off water to about 200 people living nearby for about four to six hours.

"But instead, we used the SwivelJoint to replace the old coupling and finished the entire job in under 4 hours," he continues. "Customers were without water for only an hour or two. Overall, there was a significant savings in terms of time, labor and customer complaints."

#### **Good return**

The water department keeps 6- and 8-inch diamter SwivelJoints in stock because those are the most common pipe sizes in the system. The cost is roughly \$1,300 for a 6-inch coupling and about \$1,800 for an 8-inch unit.

"The times when we find pipes that are badly misaligned are far and few between," Watts says. "But it happens often enough that we keep two in stock. We never know what's underground until we dig it up.

"We don't want to put things back in the ground partial or just try to make do because ultimately, we're the ones who have to go back and fix things if the repair doesn't hold," he adds. "So we want to do things right the first time, and the SwivelJoint helps us do that.

"Sure, the fittings are a little bit pricier, but they more than pay for themselves through reduced labor costs." **♦** 





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# MODELING THE FUTURE

San Antonio River Authority takes a long-range, technical approach to water quality improvement

By Giles Lambertson

FOCUS: STORM

veryone knows that rainwater runoff impacts water quality. Hydrology technicians at the San Antonio River Authority want to know more than that. They have created software modeling tools that let them better predict water dispersal and more effectively manage ensuing downstream water quality.

The Authority's innovative approach has earned it an excellence award from the Water Environment Federation, which said of the initiative: "These stateof-the-art tools are first of their kind in supporting management of stormwater quality and are getting national attention."

It all started with senior technical engineer Dr. Sheeba Thomas. "It was San Antonio River Authority's vision," says Thomas, who came to work at the Texas agency a dozen years ago. "When I first came here, most of my work was with flood control, so I saw a lot of work invested in modeling. Eventually, I raised the question, 'How can we do similar modeling work to manage water quality?" I subsequently led the effort to make the vision a reality."

Her previous work familiarized her with different types of models that had been developed in both public and private sectors. They ranged from simple conceptual ones to data-rich and complex models. The models predicted water volume at various points in a flood plain during a rain event and helped guide stormwater management efforts.

The Authority's mission statement spells out its commitment to "Safe, Clean and Enjoyable Creeks and Rivers." Thomas wanted to focus on the clean component of the mission. She says her goal was more than just planning for "how to get the stormwater out of the system."

So, Thomas and her colleagues in the Authority systematically began to build a program to quantify runoff and in-stream water quality, a new standard of measurement.

"The first step was to identify which model to use and set standards. There are a lot of models out there. The second step was to collect the data to build the model."

A section of the San Antonio River runs through the historic King William neighborhood just south of downtown San Antonio, Texas. (Photography by Mark Greenberg)

#### PROFILE: San Antonio River Authority

**SERVICE AREA:** 3,658 square miles, all of Bexar, Wilson, Karnes and Goliad counties.

**LENGTH OF RIVER:** 240 miles

RIVER AUTHORITY EMPLOYEES: 280

**POPULATION SERVED:** 2 million

**STORMWATER IN-FRASTRUCTURE:** 200 miles of pipe, five wastewater plants with total flow of 11 mgd

WEBSITE: www.sariverauthority.org



San Antonio River Authority's headquarters sits on the banks of the San Antonio River. The Authority was recently awarded the WEF Excellence Award for its Water Quality Master Planning Project.



Aquatic biologist Karen Sablan collects water samples for routine quality analysis near the headwaters of the San Antonio River. The entire river basin runs from Kerr County west of San Antonio almost to the Gulf of Mexico, draining nearly 4,200 square miles and dropping some 2,400 feet in elevation along the way.

#### **Modeling the watersheds**

Southern Texas is a semi-arid region and water conservation is always top of mind. Voters approved a constitutional amendment in 1917 that let the Legislature create special purpose districts in water basins, terming them river authorities. Twenty years later, the San Antonio River Authority was formed.

Its jurisdiction ranges across 3,600 square miles and comprises four counties, the most populated of which is Bexar (pronounced bear) County with San Antonio as county seat. Some 2 million people reside within the watersheds served by the San Antonio River Authority. The entire river basin runs from Kerr County west of San Antonio nearly to the Gulf of Mexico, draining nearly 4,200 square miles and dropping some 2,400 feet in elevation along the way.

The quest was to get a handle on the creeks, larger streams and other tributaries within the San Antonio portion of this basin with an eye toward better managing stormwater. Thomas began working on it 10 years ago.

"We had to first understand the watershed in more detail. Monitoring water quality can only give us so much information. We started developing models to understand the baseline conditions of the watershed, tools to quantify the pollution load from the land surface so we could determine what load came from which part of the watershed."

To that end, the Authority partnered with the 85-year-old Houston consulting firm Lockwood, Andrews & Newman and a team of subcontractors, RESPEC and T-Core. Among its services, the consulting firm offers the metrics of water quality management. For software development, the team relied on RESPEC, a 50-year-old South Dakota firm with offices from Alaska to Georgia and a reputation for integrating technology solutions. RESPEC and the consulting firm were co-recipients of the excellence award.

The Authority came up with several functions to be realized through the modeling tool. These included the measurable reduction of pollutants in a given area and the number of stormwater management structures needed to curtail pollutant loading. The team also developed an overall standard to guide development of future models.

The goal was all about minimizing pollutants carried away in rainstorms and maximizing downstream water quality. Annual rainfall in San Antonio is about 33 inches, but it is no sure thing. In 2019, just 22 inches fell. "When we do get rain, it is a lot of rain, and all the accumulated pollutants on the land surface get washed off into creeks," Thomas says.

The most prevalent pollutant, Thomas says, is not what one might expect — that is, petroleum or chemical residue washed from paved surfaces into collections systems. Rather, it is E. coli, the intestinal bacteria that periodically spawn outbreaks of disease in human populations. Thomas cites sanitary system overflows as one source of the natural pollutant.

To build a base for its modeling, Thomas and colleagues gathered rainfall and other meteorological information for the period 2007-10. That base is already undergoing an update. "San Antonio is a rapidly developing community," Thomas says, so static data will not serve it well.

Each of the 23 major watersheds in the San Antonio River Authority's jurisdiction has been modeled, some more completely than others, according

to Thomas. "Most of our basin is in some form of a model, more comprehensive ones for the upper watershed areas, but we will have detailed and updated plans for each watershed during the next five years."

#### **Better methods**

Planning in increments of years suggests the long-term nature of the project. In fact, the modeling for which Thomas and colleagues were honored is really just a preliminary phase of the overall work. After all, the ultimate goal was not to create a software tool. It was to improve the condition of stormwater in the San Antonio River basin by introducing better methods of managing runoff.

"Now the main thing is how can we join other agencies to manage development in the basin," Thomas says, acknowledging that the reach of the Authority does not extend to regulating commercial and residential growth. "We work with San Antonio and Bexar County and other agencies." The management techniques recognize varying conditions. The upper watersheds on the edge of Hill Country produce runoff that is "very quick, very sloppy," Thomas says. The lower reaches of the river where the terrain is flatter has water movement that is languid by comparison. "It is very important that we have enough controls upstream to help the downstream areas."

The upper area is more urban, with San Antonio and its suburbs dominating and delivering pollutants into basin waters. Downstream, the water is more affected by agricultural pollutants. Across the region, in upper and lower watersheds, the Authority's enhanced runoff management solutions are offered to local authorities.

The conversations with community officials and developers are in terms of best management practices and low impact development. They are the techniques of construction and landscaping that incorporate natural drainage features to reduce erosion, replenish aquifers and minimize the introduction of manmade and natural pollutants into basin waters.

"Our agency wants to help communities plan new development. We talk with various stakeholders about doing things differently based on what we have learned, rather than doing it the traditional way. We ask them to try for multiple benefits for their community as

they go forward. That's how we are trying to help manage and to get ahead of potential pollution problems."

Thomas put it this way in accepting the award on behalf of the San Antonio River Authority: "These water quality models and tools greatly enhance our abilities to conduct holistic watershed master planning, manage urban runoff and improve the quality of life of our communities."

#### Spreading the word

Some \$1.5 million was invested initially in the modeling initiative, including consulting and software development fees. The Authority will continue to invest in the program going forward, even though the fruits of its investment are not yet visible to stakeholders.

"This is a long-term planning project," Thomas acknowledges. "It takes a long time to see the effect of it on the ground. We may not see the impact



San Antonio River Authority Senior Technical Engineer Dr. Sheeba Thomas poses with the WEF Excellence Award that was recently awarded to the Authority for its Water Quality Master Planning Project.

on the river for a long time because it takes a lot of effort before we can see a difference in a creek. This is something new.

"What we are is a place for influencing things long term. We are trying to influence developers to do things differently. Instead of hoping things get better in the future, we now have a plan for them."

The San Antonio River Authority's influence is growing in some other ways, too. Last year, Thomas organized a team of staff members to volunteer in The University of Texas at San Antonio civil and environmental engineering program. They work with students in senior design projects, encouraging them to think more comprehensively about the stormwater component of civil projects.

And, as a consequence of the Authority's award-winning modeling initiative, Thomas is giving a lot of presentations to associates in the industry. These have included gatherings of the Texas Commission on Environmental Quality, area Environmental Protection Agency personnel and meetings of several professional organizations. "We have developed a lot of tools that can help other communities. We had to develop them from scratch and a lot of lessons were learned from our hard work. I'm just spreading the word."

As a bonus to industrial colleagues, the modeling tools Thomas helped develop for the San Antonio River Authority were done on open source software. So, the tools arduously created

by the Authority and its partners in the project are not proprietary. Coding is included with the compiled version of the model, which means anyone can use it rather than having to reinvent it on their own.

"We have received a lot of acknowledgement from around the world as a consequence," Thomas says. "I think we did a great service to the modeling community." ◆

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#### MORE THAN MODELING

The mission to protect and enhance water quality in the San Antonio River basin is not just a software undertaking. The San Antonio River Authority is a workboots-on-the-ground organization, too.

It bills itself as a full-service water and wastewater utility provider. Specifically, it provides wastewater services to several communities within the four counties in which it operates. In 1966, it built and began operation of its first wastewater treatment plant, the Salitrillo facility, where it handles an average 4.8 mgd of wastewater for 51,000 connections. Four other wastewater plants have since been built — all five facilities today churning out more than 11 mgd of effluent and serving 120,000 customers.

To collect, contain and treat wastewater in the river basin, Authority

infrastructure includes some 200 miles of pipe. It also manages and maintains 41 detention dams within its jurisdictional boundaries, the structures providing flood protection in the Salado, Martinez, Calaveras and Escondido watersheds.

In 2001, the Authority entered another service area when it began to provide water for two partnering water systems in Goliad County, with the customer base since growing to four communities. The water supply intervention was in response to concerns expressed by local water users.

To maintain all these facilities across its jurisdictional region, the San Antonio River Authority operates a fleet of machinery, including Vactor hydrovac trucks, sewer cleaning and tanker trucks and boom rigs. Its earthmoving equipment incorporates a range of brands and machinery types, including backhoes, excavators, skid-steers and dump trucks.

All of this operational capacity downstream from the software staff allows the Authority to turn planning into action.





## NASSCO CORNER

# **STUDYING STYRENE SAFETY**

NASSCO's new styrene safety guideline is a result of coordinated ongoing research

By Sheila Joy

NASSCO (National Association of Sewer Service Companies) is

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

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

ne of the most wasteful things an organization can do is pay for solid, primary research and then do nothing with it.

In my past life as a marketing professional I saw this happen time and time again. In many cases, the organization paying for the research did not like the results, therefore did not believe the findings and ultimately ignored the recommendations, wasting significant time and money.

Over the past several years, NASSCO has gone to great lengths to ensure our workers and communities stay healthy through the funding of comprehensive, third-party, objective research to evaluate published reports that questioned the safety of emissions from the cured-in-place pipe process when using styrenated resin.

In April 2018, after four months of research, the Center for Underground Infrastructure Research and Education found previously published reports to be inconclusive. NASSCO did not stop there, however. The researchers from CUIRE recommended additional sampling and data evaluation and analysis as a second phase of the study.

Conducted by the Trenchless Technology Center at Louisiana Tech University, the second phase of the study included field studies in a variety of geographic locations, testing different liner dimensions, conditions and worker exposure. The full report was released in January 2020 and included specific recommendations for refrigeration/store trucks and emission stacks. The full report and recommendations may be found at nassco.org/cipp-study.

Continuing to peel back the layers, a third phase of the study is currently underway to better understand and address TTC's specific recommendations from phase two so that our industry may address these concerns head-on.

When it comes to the safety of our workers and communities, NASSCO's commitment to research most likely will never end.

With the hard work and dedication of its Pipe Rehabilitation Committee, CIPP Safety Workgroup and Health and Safety Committee, NASSCO used TTC's findings and recently updated its *Guideline for the Safe Use and Handling* of Styrene-Based Resins in Cured-in-Place Pipe.

These committees also collaborated on a new informational flyer titled "What's That Odor?" The flyer is available for system owners and contractors to share with private property owners who may have concerns regarding the smell associated with styrenated resins used in the steam cure process.

The guideline, informational flyer and other information is available to the public for download at nassco.org/styrene-safety, a resource that will continue to grow as research expands.  $\blacklozenge$ 

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# <u>THE HUMAN SIDE</u>

# RESHAPING A WORKPLACE CULTURE

The keys to success are simple but improvement requires real action

By Ken Wysocky

There's a lot of emphasis these days on building a great workplace culture. Unfortunately, doing so is a lot like following through on New Year's resolutions: Much easier said than done.

But it's not mission impossible, either. And the rewards — ranging from more engaged employees and reduced turnover to increased innovation and improved customer satisfaction — certainly make it a goal worth pursuing, says Heidi Lynne, the owner of Heidi Lynne Consulting in Philadelphia.

Of course, the first step toward improving anything requires admitting there's a problem. And while workplace culture can sometimes feel like a rather nebulous concept that's difficult to quantify, it's nonetheless fairly easy to determine if an organization's culture is healthy, she notes. **"Senior lead** 

"First and foremost, you want to look at turnover — and not just the company as a whole," Lynne says. "You need to break it down by department and if there's an issue, determine what the root of the problem is."

The factors that contribute to high turnover typically are the very same indicators of a poor workplace culture. In short, companies

aren't going to win any prizes for workplace culture if they do a poor job of communicating with employees, are driven by gossip and cliques, neglect developmental training, don't provide defined career paths, and fail to recognize and celebrate employee milestones and/or accomplishments.

"To me, a good workplace culture is where everyone comes together and feels included, welcome, comfortable and creative," Lynne says. "It's a place where everyone collaborates and feels like they're part of a family a safe environment where everyone can be their respective selves.

"And it's more important today than ever before, especially in terms of being diverse and inclusive," she adds. "Those things weren't always prioritized before. Everyone must feel included, regardless of their gender and background."

#### Listen to employees

A good place to start reshaping a workplace culture is an employee survey, although Lynne says she has a love-hate relationship with them because too many companies only ask generic questions — and then don't act on the results.

"But if you create a survey that asked targeted, specific questions and you plan to use the feedback to improve the overall culture, I'm totally on board with that," she says. We invite readers to offer ideas for this regular column, designed to help municipal and utility managers deal with day-today 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.

The questions that organizations should ask can vary greatly. But some generic examples could include asking what employees would do to improve the onboarding process, how well their managers provide feedback and what three things could be done to improve the organizational culture, she suggests.

Deciding what needs to be changed takes time and effort. Too often, a chief executive officer asks Lynne what kind of programs can be implemented before they even give employees a chance to weigh in, she notes.

"You need to find out what they want," she says. "Employees want to be heard and be valued. You need to take time to ask what's important to them

"Senior leaders are starting to realize that employees are assets, that it's not about maintaining a hierarchy, but establishing a partnership."

Heidi Lynne

and create a plan around their feedback." While this may seem obvious, it's not always

the case. That's largely because generations of senior managers have built and preserved hierarchical corporate cultures based on control over employees and information. And at the same time, employees have resignedly accepted this arrangement, she notes.

"But there's a new generation of millennials that are speaking up and speaking out,

that have needs and demands and refuse to only accept what senior leadership offers," Lynne says. "Senior leaders are starting to realize that employees are assets, that it's not about maintaining a hierarchy, but establishing a partnership."

#### Hire the right people

One of the simplest ways to build a great culture is to hire employees who mesh well with the company's values. Of course, this presumes an organization has a set of core values and not only communicates and emphasizes them regularly to employees, but has managers and senior leadership who uphold them daily, she says.

"You can't just have them only as decoration," she notes. "You have to hire by them, discipline by them and fire by them."

Hiring the right people requires job interviews that delve deeper into candidates' personalities and suss out the quality of their soft skills, as opposed to just the typical behavioral what-would-you-do-if-you-encountered-this-situation type questions. To do this, Lynne prefers asking candidates their personal interests, how their friends would describe them — even how their enemies would describe them.

"You should create an informal environment and ease into things — find some common ground and determine their personalities," she notes.

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"Then if you see gaps between their personalities and the organization's core values, you can ask more targeted questions, like how would they provide feedback or how they'd react to feedback."

Organizations also need to be wary of how job descriptions are written, as well as scrutinize the overall language used that can create an unwelcoming culture. For example, Lynne says managers often use gender-coded language that makes people feel excluded, especially women and members of the LGBTQ community.

The same can be true for job postings that use words like powerful, assertive and confident to describe desirable attributes. "Those are very masculine words that can dissuade women from applying," she points out.

#### **Communication is key**

Sometimes organizations feel compelled to provide employees with "cool" perks — think foosball or ping-pong tables, video games and craft beer on tap — to improve their culture. That's all well and good, but companies that do so run the risk of putting style ahead of substance, Lynne says.

"I've seen companies mimic their competitors or Google by offering fun perks, but that's not how it works," she says. "If a company gets crummy Glassdoor reviews but offers good perks, what has it gained? It has to go deeper than that."

In the end, what really matters is great communication with employees and leadership that not only talks the talk, but walks the walk. For example, it helps immensely if a company that says it values feedback and wants a feedback-driven culture also has a chief executive officer that regularly walks around and visits with employees instead of remaining secluded in an office, she says.

"Or maybe a CEO that gets a lot of pushback about lack of transparency starts holding town hall events," she adds. Of course, the corollary to that is that CEOs then have to actively act on the feedback they receive — not treat it like yet another half-hearted New Year's resolution. ◆



# THE SUPPLY SIDE

# FOCUSED ON MANHOLE SOLUTIONS

Cretex helps utilities prolong asset life and fight inflow and infiltration

By Luke Laggis

eaking manholes are a problem for every wastewater utility. Cretex Specialty Products has been providing solutions to that problem for 40 years.

General Manager Lee Haessig has been with the company in various roles for 28 years, serving in his current role since 2013. His extensive product knowledge allows him to conduct installation training, demonstrations and offer field support to engineers, owners and contractors. He has also been involved in the National Association of Sewer Service Cos. since 2003, serving on a number of the association's committees.

*Municipal Sewer & Water* recently spoke with Haessig about Cretex's history and its mission to help utilities fight inflow and infiltration.

#### By ensuring a new or repaired manhole stays watertight for a long period of time, it ultimately frees up budget money because constant repair is no longer needed.

#### Lee Haessig

## MSW: Tell us a little about the history of Cretex and its position in the wastewater industry.

**Haessig:** Cretex Specialty Products is owned by The Cretex Cos. located in Elk River, Minnesota. The Cretex Cos. were founded in 1917 by L.D. Bailey and D.W. Longfellow during the time when our infrastructure was starting to grow at an explosive rate. The Cretex Cos. are a diversified family of manufacturing companies serving three distinct markets: medical, aerospace and defense, and infrastructure.

From May 1980 until September 1983, Cretex Specialty Products operated within Waukesha Concrete Products (precast concrete pipe and manholes) in Waukesha, Wisconsin. Cretex Specialty Products was officially established as a division of Waukesha Concrete Products in September of 1983. The first Internal Manhole Chimney Seals were installed in February 1981 in the suburbs of Milwaukee.

The first product introduced by Cretex Specialty Products was the Internal Manhole Chimney Seal and approximately two years later, the External Manhole Chimney Seal was brought to market. The need for and development of the seal came as a response to a presentation given by the Sewer System Evaluation Survey staff from CH2M Hill (now Jacobs Engineering Group) for the Milwaukee Water Pollution Abatement Program that



Cretex Specialty Products General Manager Lee Haessig

#### THE SUPPLY SIDE

NAME: Lee Haessig

JOB TITLE: General Manager

YEARS IN THE INDUSTRY: 35

**YEARS WITH COMPANY:** 28

outlined the problem of manhole chimney inflow. The Milwaukee Metropolitan Sewerage District and the SSES had identified manholes as one of the major sources of excess clear water entry into the sanitary sewer collections system.

We are positioned as the leading manufacturer and supplier of mechanical internal and external manhole frame chimney seals and other products used to stop or prevent inflow and infiltration, including PRO-RING, a lightweight grade adjustment system used for manholes and underground utility structures. We are represented throughout the United States, Canada and Australia.

#### MSW: What's the most common problem you see your municipal customers facing and what mistakes do you see them making in the fight against inflow and infiltration?

**Haessig:** We often see municipal staff using inexpensive Band-Aidtype products and materials to seal leaks in manholes. There are so many products on the market claiming to solve I&I issues that it can be overwhelming. Even though some products may cost more initially to purchase and install, a long design life can easily make up for that cost. Repeatedly sealing leaks with less expensive and often more time-consuming products can end up costing much more when added up over years. Other approaches may involve larger or more complex projects when it may be easier and more cost effective to focus on the easy fixes.

## MSW: What does the full suite of Cretex products provide for municipal utilities?

**Haessig:** Our product offering allows anyone constructing a new manhole to ensure it is watertight when constructed and throughout the life of the asset. On rehabilitation projects, our products allow for trenchless installation in most cases making it less disruptive and much less expensive than opencut reconstruction or replacement.



#### Simply put, we have the best products backed by industry leading warranties and support.

Lee Haessig

#### MSW: How has your product line evolved to better meet the needs of municipal utilities with aging infrastructure and limited budgets?

**Haessig:** There have been improvements to existing products making them more cost effective and easier to install and we have also added innovative products that are much safer and easier to install. These improvements and new products help reduce cost by requiring less manpower and equipment while increasing the life expectancy of the manhole. By ensuring a new or repaired manhole stays watertight for a long period of time, it ultimately frees up budget money because constant repair is no longer needed.

## MSW: Is your product line aimed more at infrastructure rehabilitation or new construction?

**Haessig:** The manhole chimney seals were originally developed as a technology for use on manhole rehabilitation projects, but that changed. It wasn't long before cities and engineers figured out that if these seals could stop water in existing manholes, they most certainly would do the same when installed on new manholes. Over the years, we have experienced significant growth and use in new construction to where we see about 70% of our products being specified and installed on new manholes.

#### MSW: What differentiates your line of sealing and rehabilitation products from the competition?

**Haessig:** Our products have been designed with specific manhole applications in mind. Our chimney seals and joint seals are mechanical, compression type seals that do not rely on any type of adhesion or bond to the surface of the manhole. Our exterior joint wraps are mastic backed, but mechanically fastened to the manhole or pipe with steel compression bands. Simply put, we have the best products backed by industry leading warranties and support.

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

**Haessig:** For the most part we sell through waterworks distributors that have both contractor and municipal sales channels. That said, we do sell direct to cities, utilities and contractors based on project specifics and need.

#### MSW: What sort of training and support does Cretex offer?

Haessig: We offer complete hands-on installation training for anyone

Cretex systems provide a lightweight, easy-toinstall solution for sealing manholes and bringing them up to grade.

wishing to receive it. Training is conducted by Cretex sales personnel or one of our experienced independent representatives.

#### MSW: Could the average municipal utility install Cretex products with an in-house crew?

**Haessig:** Absolutely. Our products are designed with the end user in mind and can be easily installed by following our printed instructions or by watching one of our videos.

## MSW: How do you see infrastructure rehabilitation evolving as technology improves?

**Haessig:** Our hope would be to see a greater emphasis put on the renewal of our aging (underground) infrastructure. With improvements in rehab technologies, I believe that we will see more opportunity for contractors to expand and grow their businesses. I would also expect to see more municipalities make the investment to purchase materials and equipment and bring some of this work in house.

## MSW: What's coming up for Cretex in 2021 and what can customers expect out of you in the future?

**Haessig:** It looks to be another year of expansion of our PRO-RING Manhole and Catch Basin Grade Adjustment System product line. PRO-RING continues to gain acceptance as the premier product in the sanitary sewer and stormwater markets. We have also seen a growing interest in PRO-RING from the underground telecommunication and electrical markets. Combined with an increase in the need to prevent I&I in manholes, we are positioned well for the foreseeable future.  $\blacklozenge$ 

#### Aries Industries adds new Nova Scotia dealer

Aries Industries has strengthened its international market reach by adding Nova Scotia-based SNT Solutions to its dealer network. SNT Solutions, based in Dartmouth, Nova Scotia, brings 20 years' experience in the sewer, inspection, refuse and public works equipment industry. As an Aries Industries dealer, it will sell and service Aries sewer inspection and rehabilitation equipment to customers throughout the eastern Canadian provinces of Nova Scotia, New Brunswick, Prince Edward Island and Newfoundland.

#### USL America Group taps Rigby as Logiball sales and marketing manager



USL America announced Don Rigby as national sales and marketing manager for Logiball. With over 40 years' experience in engineering sales, marketing, and business development, he has served as instructor, speaker and advocate on matters of injection grouting for wastewater collections systems. As the principal author of an

**Don Rigby** 

NASTT Good Practices coursework titled *Municipal Sewer Grouting*, Rigby currently serves as chairman of the Manhole Rehabilitation Committee for NASSCO.

# Mainline Sales joins SJE Rhombus as new rep for Nevada

Mainline Sales is SJE Rhombus' new manufacturer's representative for the state of Nevada. Mainline Sales has nearly 40 years of experience as a professional manufacturers' representative firm covering California, Nevada, Arizona and Hawaii. It serves the following markets: commercial and residential plumbing, mechanical, fire protection, industrial, irrigation and water and sewer waterworks. Mainline operates multiple California-based distribution centers located in Anaheim, San Diego and Sacramento, as well as centers in Las Vegas and Phoenix.

#### Barbco selected as a 2020 Business Excellence Award recipient

Ohio's Canton Regional Chamber of Commerce awarded Barbco with a Business Excellence Award at its Virtual Annual Meeting on Oct. 27. To be considered for the award, for-profit businesses have to have distinguished themselves by being a significant presence in, or provide substantial benefit to, the citizens and economy of Stark County, Ohio.

#### Matt Madeksza named president and CEO of Veolia North America



Veolia North America announced that Matt Madeksza was named president and CEO. In his new role, Madeksza will be responsible for overseeing a company that serves approximately 4,000 industrial and municipal customers across the U.S. and Canada. Madeksza replaces interim President and CEO Brian Clarke, whose years of VNA

The Theory

experience helped effectively guide the company through challenges posed by the COVID-19 pandemic.

#### Ellingson celebrates 50 years in business

Founded in 1970, Ellingson Trenchless is an independent water- and

infrastructure-management company providing safe, technology-driven construction planning, design and installation services. In the last 20 years, Ellingson has worked to expand its trenchless solutions business and continues to grow its ag business, especially in Minnesota's Red River Valley. The company offers pipe relining with advanced CIPP technology and recently acquired Direct Technology Drilling, adding environmental remediation capabilities to the company's growing portfolio of trenchless construction services.

#### Mueller awarded contract for AMI deployment

Mueller Systems announced the city of Newport Beach, California, selected Mueller Systems to deploy 26,500 advanced metering infrastructure water meters. The project will include the replacement or retrofitting of all current city water meters with the Mi.Net AMI system.

# Vacuworx recognized as 2020 Manufacturer of the Year

The Oklahoma district of the U.S. Small Business Administration named Vacuworx the 2020 Manufacturer of the Year as part of National Small Business Week. For more than 50 years, the U.S. Small Business Administration has celebrated NSBW, recognizing the contributions and successes of America's entrepreneurs and small-business owners.

# Veolia secures three municipal water contracts in Minnesota

In Hanover, Minnesota, a three-year contract was renewed for \$274,000 to continue overseeing the town's collections and distribution system. Veolia North America has been in partnership with Hanover since 1996. In St. Michael, the company was awarded a three-year renewal for \$3.175 million to continue operating and maintaining the town's water and wastewater collections and distribution system, including a wastewater treatment plant with a capacity of 2.5 mgd. VNA has been in partnership with St. Michael since 1996. VNA also secured a three-year, \$1.9 million renewal with the Joint Powers Water Board groundwater treatment plant, serving the communities of St. Michael, Albertville and Hanover. The plant has a capacity of 10 mgd. VNA has been in partnership with the Joint Powers district since 1998.

# Orange County District awarded for COVID-19 response

The Orange County Water District was named a gold winner in the One Planet Awards competition in three categories that relate to COVID-19 information: Communications or PR Campaign, Heightening Awareness and Publicity Campaign, and Marketing Campaign of the Year for its submission, *Affirms the Safety and Reliability of the Local Water Supply*. The One Planet Awards is a premier program honoring best in business and professional excellence in every industry globally.

#### NAWC names recipient of Living Water Award

The National Association of Water Companies announced Aqua Virginia Operations Manager Daniel Hingley, PE, as the recipient of the 2020 NAWC Living Water Award at the NAWC Virtual Water Summit. The award is presented annually to the regulated water industry professional who best demonstrates excellence in serving their community, colleagues, industry or environment.

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- Remove protruding taps

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# **PIPELINE REHABILITATION & RELINING**

By Craig Mandli







#### CIPP

#### Fast Pipe Lining Air Inverter

CIPP installers must have high inversion pressure to install a 6- or 8-inch liner. Sometimes the pipe cannot take that pressure and it breaks. The Air Inverter from Fast Pipe Lining can reduce this pressure by 25% and keep the liner inflated until curing is complete. The inversion unit has an oiling system that reduces food grade oil consumption to 1 gallon per 300 feet. The inversion gaskets are low cost, and a simple size change on the gasket only requires a razor knife. 888-960-1674; www.fastpipelining.com.

HammerHead Trenchless Bluelight LED System • The HammerHead Trenchless Bluelight LED System is a CIPP lining system that uses LED light to cure up to five times faster than conventional curing methods. Made for laterals and small sewer pipes 4 to 10 inches in diameter, this technology greatly reduces the time installers must wait for a liner to cure, allowing them to complete jobs more quickly. The specially formulated resin cures with LED light quicker than traditional epoxy resins that are cured with steam, hot water or ambient air. The system is compact and lightweight, making it easily portable on the job site. In addition, it includes a camera mounted in the light head, allowing the installer to visually inspect and monitor the cure progression. 800-331-6653; www.hammerheadtrenchless.com.

#### Pipeline Renewal Technologies VeriCure

VeriCure from Pipeline Renewal Technologies monitors cure temperature continuously along a CIPP liner during installation to ensure a complete cure every time. Designed to distinguish localized thermal variations, it takes readings every inch and averages into 18-inch measurement zones — a spatial resolution at least seven times that of other technologies. The accompanying software is tailored to CIPP professionals, delivering real-time data to help control cure for maximum quality and efficiency and summarizing the completed process, making it easy to document successful installation for the asset owner and consulting engineer. With its unobtrusive 3 mm probe, this technology preserves a liner's flow characteristics while providing necessary temperature data to ensure a complete, long-lasting cure. It makes it affordable to prevent lifts, delamination, overtensioning, and environmental contamination and leaves users confident that the host pipe is rehabilitated to specification and performs as intended. 866-936-8476; www.pipelinert.com.

4. Reline America RE4000 UV GRP The **RE4000 UV GRP** CIPP curing unit from **Reline America** has a built-in Total Quality Management system with a QR code reader that automatically sets all system curing parameters based on the manufacturer's specifications, as well as a tamper-proof reporting and QC monitoring system. Pre-cure CCTV inspection of the liner is enhanced with the onboard pan-and-tilt camera. It is equipped with six 4,000-watt UV lightbulbs providing up to 24,000 watts of UV light. It allows for curing of liners over 24 mm in thickness and greatly reduces the cure time, allowing for quicker return to service. The built-in model has 1,100 feet of cure cable, while the portable unit has 650 feet of cable. The portable unit allows curing in hardto-access areas. 276-496-4000; www.relineamerica.com.

#### **EXCAVATING EQUIPMENT**

# 5. RAMVAC Vacuum Excavators by Sewer Equipment HX-12 The HX-12 hydroexcavator from PANEL 2

The HX-12 hydroexcavator from RAMVAC Vacuum Excavators by Sewer Equipment has a 12-yard debris box and a standard 4,400 cfm blower designed to match the performance of larger blower machines while delivering fuel economy. Its directional discharge system allows the off-loading of debris back into the excavation site without the mess of dumping the tank and lets operators easily blow obstructions out of the dig tube without having to shut down vacuum operations. It is a true all-weather vacuum excavator, as all major water components, including plumbing, water tanks and water pump, are housed within a temperature-controlled environmental chamber to avoid water system freezing when working in subzero temperatures. It includes a long-range wireless remote, NEMA 4 electrical system, a 900,000 Btu water boiler and a three-stage cyclonic filtration system. 877-735-4640; www.ram-vac.com.



#### Super Products Mud Dog

**0.** The **Mud Dog** vacuum excavator from **Super Products** provides a safe and efficient alternative to traditional digging. It is designed for operator convenience and consistent performance even in the harshest environments. Units come standard as hydroexcavators with an optional air excavation package, which allows an operator to always choose the best application, water or air, for the job. It is available with 12- or 16-yard debris capacity and has a 1,500- to 2,000-gallon water tank capacity. Each model comes standard with tilt ejection unloading, and a rear-mounted boom that reaches 27 feet, has 335-degree rotation and can move in a 45-degree upward and 25-degree downward pivot. This allows for versatility within dig areas so that units do not need to be constantly readjusted into position. **800-837-9711; www.superproductsllc.com.** 

#### Tornado Global Hydrovacs F4 ECOLITE

The **F4 ECOLITE** from **Tornado Global Hydrovacs** has a 12-cubicyard mud tank and holds 1,550 gallons of freshwater. The unit is more than 7,000 pounds lighter than the company's older models and offers more than double the payload. The boom has a 342-degree rotation and 26-foot reach. The smaller F3 ECOLITE is a 10-cubic-yard, 1,250-gallon tandemaxle unit that more than doubles older payload capacities. It features an 8-inch boom and 3,800 cfm blower. **877-340-8141; www.tornadotrucks.com**.

#### GROUTING

#### • Aries Industries test and seal grouting system

**0.** The test and seal grouting system from **Aries Industries** reduces setup time and provides efficient hands-on control to quickly seal leaking joints. Grout — pumped to a leaking joint — flows through the leak, sealing the surrounding soil to form an impenetrable barrier. Sixty-gallon tanks and continuous-duty mixers provide high volume to seal large voids. Reels for fast deployment and retrieval, as well as high-power winches, quickly move the packer from joint to joint for high productivity. The unit's 800 feet of color-coded hose allows long runs. The truck comes with a bench, storage and room to work. The operator tests and seals the joints while working in the control room, where test data and the sealing process are easily viewed, recorded and logged. **800-234-7205; www.ariesindustries.com**.

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#### • Avanti International AV-100

**7. AV-100** chemical grout from **Avanti International** is used to rehabilitate storm and sanitary sewer systems by eliminating infiltration in manholes, mainlines, joints, laterals, lateral connections, and before or after various forms of CIPP lining. It is injected after lining seals in the annular space between host pipe/liner, and lateral reinstatement, which are the primary sources of infiltration. It is an ultralow viscosity, chemically reactive gel with a similar viscosity to water. It can permeate anywhere water can travel and has adjustable cure times from seconds to hours, creating an effective, long-lasting water barrier while providing soil stabilization. **800-877-2570; www.avantigrout.com.** 

#### PIPE BURSTING TOOLS

# Pow-R Mole Trenchless Solutions PD-33M

**V.** The **PD-33M** pipe bursting machine from **Pow-R Mole Trenchless Solutions** is designed to replace existing underground pipes 2 to 6 inches in diameter. Its nonslip, cylinder-activated jaws prevent cable damage while providing 60,000 pounds of pulling force. It offers a cost-effective alternative to opencut excavation, reducing customer disruption and increasing company profits. The process replaces the existing pipe with a fused HDPE pipe, which eliminates all joints, and allows the operator to pull through bends such as 45-degree fittings. This system is modular and can be easily disassembled and reassembled for manhole and basement applications. With a compact design and very small footprint of only 20 by 20 inches, this unit can be used in tight locations. **800-344-6653; www.powrmole.com.** 

# Spartan Tool UnderTaker

With 30 tons of lateral pulling force, the **UnderTaker** pipe bursting system from **Spartan Tool** employs a hydraulically powered cylinder that pulls a bursting head through the existing line while simultaneously replacing it with seamless, high-flow, code-approved HDPE pipe. With a small hole at each end of the run, the user can pull pipe from the building to the main, accommodate bends in the pipe, increase diameter and lay new line at a rate of up to 5 feet per minute. The system allows replacement of 2- to 6-inch pipe with up to three 45-degree bends in the pipe. It can also upsize from 4- to 6-inch pipes. When assembled, the unit weighs 210 pounds, but it disassembles into four separate components for easy transport, with no part weighing more than 70 pounds. **800-435-3866; www.spartantool.com.** 

# **PRODUCT FOCUS** PIPELINE REHABILITATION & RELINING



#### **PIPE CUTTERS**

#### CUES Currahee cutters

CUES small and large Currahee cutters are specifically designed to reinstate wastewater service laterals, remove protruding taps, and brush finish existing cuts. The cutters function in a range of 5.25- through 36-inch pipe, are equally effective in CIPP or fold-and-form liners, and can be installed on any CCTV manufacturer's truck-mounted system. A 1.9 hp air motor for the small cutter line provides more power, increased productivity and a smoother cut when operating in 6- to 12-inch relined pipe. Kits are available to retrofit existing cutters for use with Kangaroo air-motors, and service kits can be purchased for regular maintenance intervals on existing motors. 800-327-7791; www.cuesinc.com.

#### Enz USA Milling Cutter

3. Enz USA Milling Cutter The Enz USA Milling Cutter offers a complete line of cutting solutions for the toughest projects. The milling cutters can remove the hardest deposits such as lime scale and concrete. They work with a percussion system of 600 to 3,000 impulses per minute and up to 15 tons of impact force. For lime scale, carbide teeth are recommended, and for concrete, diamond teeth. It can be used in pipes from 1.2 inches with the ML28 up to a 240inch pipe. Most of the milling cutters work with recycled water. In many cases, the use of a percussion milling cutter is the only alternative to digging up pipes under foundations or roads. The diamond crown cutter can even remove protruding laterals. 877-362-8721; www.enz.com.

**4**. RIDGID StrutSlayr The **RIDGID StrutSlayr** strut shear head creates clean, square strut cuts free from chips and burrs with a single pull of the trigger, in five seconds or less. It easily attaches to the RIDGID RP 340 press tool. It has a built-in measuring guide and 13/16-inch, 15/8-inch or combo quick-change dies. It's also TRISTAND mountable. 800-769-7743; www.ridgid.com.

#### **PIPE FUSION**

#### Reed cordless, portable pipe beveler adapters

Cordless, portable pipe beveler adapters from Reed quickly and safely bevel plastic pipe on the job site. The battery-powered CPB trims edges of smallor large-diameter plastic pipe, including pipe already in the ditch. Adjustable for bevel length up to 1 inch, the required carbide router bits cut evenly and efficiently, and the guide plate eliminates guesswork and yields a consistent result. The adapters fit Milwaukee Tool, Bosch or DeWALT die grinders. The CPB also adapts to bevel pipe interiors. 800-666-3691; www.reedmfgco.com.

#### **PIPE LINING**

**6** AGRU America Sure-Grip **Sure-Grip** liners from **AGRU America** are made of HDPE, HDPEel, PP, PVDF or ECTFE, and serve as a long-term alternative to spray-applied concrete protection products. The liners prevent concrete corrosion and degradation, can substantially extend the lifetime of a structure, and by preventing exfiltration and infiltration, provide direct protection for the environment. The liners have anchoring systems that enable construction in areas of significant backpressure. These liners are long lasting, and do not require tank emptying and cleaning every few years for reapplication. 843-546-0600; www.agruamerica.com.

# Applied Felts AquaCure

The AquaCure TPO/PP, multilayer felt liner from Applied Felts has a stitched seam and a durable polypropylene coating that can withstand tough on-site conditions and steam cure processing. This quality manufactured liner conforms to ASTM-1216 and can accommodate pipes from 6 to 80 inches in diameter with wall thickness from 3 to 42 mm. It is manufactured in accordance with ISO 9001:2015. Understanding unique project requirements and cultural, geographic and installation challenges, the technical support team works with customers in the lab, throughout the manufacturing process and on the job site to ensure each and every product stands the test of time. 276-656-1904; www.appliedfelts.com.

 Cretex Specialty Products HydraTite
 HydraTite internal joint seal from Cretex Specialty Products is a mechanical, trenchless remediation for leaking pipe joints. It consists of a rubber seal that spans the joint and is held in place by stainless steel retaining bands on either side of the joint. The retaining bands are hydraulically expanded and locked in place using a wedge lock design, which forms an airtight seal around the joint, eliminating all possibilities of infiltration or exfiltration. These seals can be custom-fitted into irregular-shaped conduits and may be used as end seals on CIPP projects. The system is a recognized method of joint repair by American Water Works Association Manual M28 and has been widely accepted and approved by engineers, municipalities and Departments of Transportation. It has a 50-year design life, does not require excavation and has a low profile that ensures minimal flow loss. 800-345-3764; www.cretexseals.com.

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# PRODUCT FOCUS



#### Danby PVC Lining System

The Danby PVC Lining System is a barrier of concrete protection from damaging hydrogen sulfide sewer corrosion. This liner can be installed in round pipe as a spiral wound and/or as a modular panel system to form to arch, square and irregular shapes. Liners can be used for rehabilitation of existing structures such as large-diameter sewer pipe, tunnels, lift stations and manholes. They are also a suitable way to preserve new RCP precast pipe. The liner ribs lock into the concrete, forming a mechanical anchor between the liner and host concrete structure. 281-598-1126; www.danbyrehab.com.

#### Epoxytec CPP Sprayliner

CPP Sprayliner from Epoxytec is a suitable solution for lift station rehabilitation and lining, including wet wells, pump stations, and other fluid-handling and pumping stations. It is a two-component moistureinsensitive, highly adhesive, chemical-resistant, 100% solids, high-strength, reinforced epoxy. Equal to standard CPP once cured, this version is packaged more conveniently for spray applicators seeking to utilize plural-component heated spray application. The material can be sprayed ultrahigh build, between 1/16 and 1/4 inch (62.5 to 250 mils) per pass. Blended with reinforcing agents and various fibers, the epoxy, 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.

#### HyFlex 30GM

The 30GM from HyFlex is a compact mortar application system powered by a Kohler gas engine, with an optimized 2L6 rotor/stator pump capable of delivering heavy mortars and other bagged products. It has a 4.5-cubic-foot manual dump mortar mixer that pivots forward and backward to allow for easy cleanup in between batches. An onboard 12 cfm air compressor provides enough air to spray with, or it also is suitable for using with Slinger spincaster for efficient manhole relining. It is available in a trailer format or skid-mount for easy truck mounting. The towable format at 1,380 pounds is light enough to tow with a UTV for transport into remote or difficult-to-reach locations. 866-849-6246; www.hyflexcorp.com.

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 and coating. The coating resin forms a pipe inside the orig-

inal pipe that is a tested, safe and environmentally friendly product. 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 multistory buildings. The system is practical and easily fits in tight places. 219-440-1404; www.picotesolutions.com.

23. Prime Resins Primecell Kit The Primecell Kit from Prime Resins is composed of Soakem Oakum (a dry oakum) soaked in a hydrophilic polymer solution. When wet and either packed or worked into a joint or crack, the resin will foam to form a flexible and tight joint to stop groundwater infiltration. It reacts with water and becomes a watertight rubber-like nontoxic composite. The oakum cord gives strength and density to the composite and makes the application of the resin easier, especially when gushers are present. Primary applications include manholes, culverts and stormwater structures. The kit includes one 10-foot strip of Soakem Oakum, 48 ounces of resin, two insertion sticks, and eight pairs of vinyl gloves. 800-321-7212; www.primeresins.com.

## Sauereisen SewerGard Roll Applied 210XROL Sauereisen SewerGard Roll Applied 210XROL is an epoxy lining

system designed to protect concrete surfaces of municipal structures and collections systems from chemical attack and physical abuse. The system ensures ease of application on vertical surfaces, does not require a primer, contains zero VOCs and prohibits water inflow and infiltration. It is resistant to corrosive conditions common to the municipal wastewater treatment industry and suitable for application over damp or dry concrete surfaces. Depending on surface temperatures and substrate conditions, it can be applied up to 25 mils per coat. 412-963-0303; www.sauereisen.com.

#### **REINSTATEMENT CUTTERS**

## 25. RapidView IBAK North America MicroGator 2.0 The MicroGator 2.0 from RapidView IBAK North A

The MicroGator 2.0 from RapidView IBAK North America is a single-point electric reinstatement cutter and grinder. It offers longer cable lengths, powerful and quiet cutting motors, and drive units designed to withstand the toughest jobs, and comes equipped with a powerful, yet efficient motor with a maximum revolution speed of 10,000 rpm while only running at 3.5 kW. Multiple cutter heads are available specifically for certain materials typically encountered in the sewer, as well as cutter shaft extensions for deeper access into laterals. There is also a selection of motor sizes to suit the conditions on site. It can access relined mainline sewers as



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# **PRODUCT FOCUS** PIPELINE REHABILITATION & RELINING





small as 8 inches, all the way up to 32 inches in diameter. 800-656-4225; www.rapidview.com.

#### TRENCHLESS RELINING EQUIPMENT

26. Krausz USA HYMAX Digital Application Selection Guide The HYMAX Digital Application Selection Guide from Krausz USA is a web-based app that enables users to find the right HYMAX product for any water or wastewater pipe repair. Searches can be done according to the field situation of the repair, such as a crack or hole in the pipe; the application, such as if a pipe needs to be connected or restrained; or the HYMAX product name. The HYMAX Digital Application Selection Guide is an effective tool for installers in the field, operations directors and superintendents, purchasing directors and warehouse managers, and engineers. 855-457-2870; www.krauszusa.com.

#### **77** Paramount Pipe Lining Products calibration tube

**L1.** The high-frequency, light-duty, yellow calibration tube is the newest addition to the Solace family of calibration tube products offered by **Paramount Pipe Lining Products.** The tube uses an advanced, high-frequency seaming and sealing system. The seam/seal application includes a welded overlap seam to ensure an airtight calibration tube. Recommended for single use, it is manufactured using ultraflexible, lightweight poly-ethylene fabric with a PVC coating, and it can be installed via inversion or pulled-in-place. **833-663-2477; www.paramountcipp.com.** 

#### **78** Subsite Electronics TK RECON Repeater

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# **CASE STUDIES**

#### PIPELINE REHABILITATION & RELINING By Craig Mandli

# CIPP lining restores cast iron pipe at naval base

#### Problem:

When a naval base in San Diego was remodeling its restrooms, the contractor found a crack in the 4-inch cast iron pipe.

#### Solution:

Flow Infrastructure was contracted to use CIPP lining in order to avoid unnecessary jackhammering to the floor in the bathroom, office spaces and a conference room. The crews first inspected, then cleaned the buildup from inside the existing pipe. Once clean, the CIPP liner from **Internal Pipe Technologies** was inserted into the pipe from the toilet flanges and clean-outs.



#### **RESULT:**

The contractor finished the restroom remodel and the liner now acts as a new pipe within the existing cracked cast iron pipe. The job was completed without demolition to the facilities. **888-478-6649**; www.internalpipetech.com.

#### Internal joint seal used to replace hole in water supply pipe

#### Problem:

On a project along the U.S.-Mexico border, a contractor damaged a pipeline while drilling into the ground. The drilling caused an 11-inch hole in the pipe that supplied water from the United States to Mexico.

#### Solution:

**Miller Pipeline** was called to install **WEKO-SEALs**, its internal joint seal. Once on site, the team conducted its usual safety assessment of the area for precautions it would need to take. As the technicians made their way into the 72-inch pipe, they smoothed the damage inside to ensure the steel backing band would fit correctly. After fitting the rubber sleeve into place, the technicians secured two 72-inch seals, which expanded to provide a bottle-tight fit. Once the seals were in place, the technicians moved to the outside and applied a concrete mortar around the pipe to complete the patch.

#### **RESULT:**

Within a week of getting the call, the team had sealed the pipeline, saving many communities from water service disruption. **800-428-3742**; www.millerpipeline.com.

#### CIPP lining system used to rehab shared lateral

#### Problem:

All Drains Rooter Service in New York was asked to fix a compromised 50-plus-year-old, 4-inch cast iron sewer lateral. There were open joints on the

leaking and deteriorating pipe. During inspection, it was found that the next-door neighbors shared the lateral line to the main, but it was located under the driveway. Excavating would mean tearing up the driveway and sidewalk at a significant expense.

#### Solution:

CIPP was chosen to line the 35-foot pipe. Pipe Lining Supply's Northeast technical trainer assisted the installer. The pipe had a hard 90-degree turn off the bat, then a 45-degree turn to the neighbors' house (under the driveway), and another 45-degree turn to the main (located under the sidewalk). A lightweight and portable **Quik-Shot** unit from **Pipe Lining Supply** was brought to the basement. A Renssi High-Speed Cable Machine was used to prep and clean the line, then the Quik-Roller



along with a vacuum was used to properly wet out the liner material (following the ASTM standards). Then the Quik-Heater was used to cure the liner. To finish the job, techs entered the neighbors' house and used a Renssi cutter to open a reinstatement and sandpaper it smooth.

#### **RESULT:**

The liner hit the mark perfectly, the installer was elated with the performance of the equipment, and the homeowners didn't have to tear up their yard/driveway/sidewalk to complete the job. **888-354-6464;** www.pipeliningsupply.com.

#### Spray-in-place lining system enables city to stay on budget

#### Problem:

Keene, New Hampshire, faced budget restraints, poor flow, discoloration and leaks in its water distribution system. The city sought to make the repairs using cement mortar or epoxy resin lining, but all bids came in over budget.

#### Solution:

Triton Lining Systems proposed a sameday, return-to-service approach utilizing its SIP (Spray In Place) process and high-build,



SIF (Spray in Place) process and ngn-build, structurally enhancing, rapid-setting polyurethane. This material has NSF 61 certification and a one-hour cure/return-to-service time. The project was to be undertook without the use of an aboveground temporary bypass system, thus staying within budget by eliminating the costs and problems associated with the bypass system. The city obtained clearance and approval from regulatory bodies to adopt the proposed process. The project consisted of 2,505 feet of 6-inch cast iron pipe, broken down into seven individual pipe sections.

#### **RESULT:**

Despite a few issues with the piping system and isolation valves, the project was undertaken as planned and completed on time. No consumer was without water for longer than the time frame given for each pipe section. **407-928-9339; www.tritonpipelining.com.** 



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Product Spotlight

# Recycled water keeps sewer cleaner in constant operation

#### By Craig Mandli

sing recycled water can save money and keep your jet/vac crews on the job longer. The Recycler CR150 from Bucher Municipal is a sewer-cleaning unit with a continuous recycling system designed to perform throughout the day without the need to stop and refill the tank with new water, saving water, time and fuel.

"The contractor stays on the job all day using recycled water," says Jacob Amrine, regional sales manager for Bucher Municipal North America. "The truck is constantly recycling water while you're working, which means your tank never runs dry."

The truck is equipped with a five-step recycling system that cleanses the water and ensures a prolonged life of the tank, jetting pumps, nozzles and pipelines. It includes centrifugal cyclones, a Desmi S80 transfer pump, coarse and fine filters, plus internal jetting booms for cleaning of the filters. As the water in the 15.7-cubic-yard tank is used, a partition between the freshwater and spoils tank may be moved to provide additional space for sludge hauling, while keeping the water and sludge separated at all times. It comes equipped with a CVS Vacu-Star WR 3100 liquid ring vacuum pump that provides 124 gpm suction



at 2,175 psi. Jetting is provided by a Uraca P3-45 pump offering 124 gpm at 2,175 psi.

The unit is built up by modules, allowing for fast assembly and easy service. The unit's pumps are designed to withstand extreme conditions, plus there is no tube assembly or breakdown required. The unit's smart cabinet solutions (including a handwash facility, two hose shelves and two tool shelves) and storage spaces provide the operator with an efficient working station. Two control panels enable the operator to manage all functions and set up the unit for the job at hand. The control panels are mounted inside the cabin and on the back of the tank. The panels are designed with buttons and the larger screens have a color display for a more intuitive operation. According to Amrine, the unit is built as a response to an idea that is "really starting to take off in the U.S."

"We have 30 of these units in the field, and the stats show the productivity these crews are getting," he says. "The upfront cost is a little higher, but the increase in productivity pays off in the long run." **704-658-1333; www.buchermunicipal.com.** 

#### ADS PRISM 2.0 software platform

PRISM Version 2.0 software platform from ADS Environmental Services provides the tools to capture, cleanse, analyze, store, report and visualize actionable answers to the industry's most critical wastewater collections system problems — prioritizing sewer cleaning and preventing SSOs, assess-

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ing your RDII, and measuring and managing your CSOs. The cloud-based platform's home page provides immediate system insight including a map view reflecting flow, level and rainfall monitors with location and condition details, leaderboard tiles with system status and quick access to the data vault, as well as specialized reports. Users can configure alarms for advance notice of developing problems, while data, reports and related files can be shared among cross-functional groups. **800-633-7246; www.adsenv.com.** 

#### McElroy DataLogger 7 tablet

The DataLogger 7 tablet from McElroy provides assurance that pipelines adhere to industry standards before going into service. Advanced features on the tablet include more than 14 hours of battery life and a hot-swappable battery option to keep fusion operators up and running. A faster and more powerful processor powered by Android 9 gives the ability to run additional business apps on one personal device. A pre-installed SD card in the onboard storage expansion slot provides a redundant backup of fusion records, so no data is lost. The military-grade hardware makes the IP68-rated tablet dustproof, waterproof and shockproof. A 7-inch touch screen offers great readability even in sunlight and can be used with gloves and in wet conditions. **918-836-8611; www.mcelroy.com.** 



#### Puck Enterprises Boom Truck lead pump

Puck Enterprises's Boom Truck lead pump is manufactured for supreme flexibility and reach, allowing better, easier access to tanks and lagoons. It's equipped with a CAT 13B DRPTO engine that can achieve maximum power at 577 hp. This translates to a 3,200-plus gpm pump capacity. Engine control and monitoring with Puck's Light-Speed control system software is also available. The truck's boom utilizes Puck's suite of hydraulic and electric control systems to ensure that the boom can be placed

exactly where it needs to go. The wirelessly-controlled boom boasts a 70-foot reach, which is supported by four large outriggers. **712-653-3045;** www.puck.com.  $\blacklozenge$ 

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