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DOING MORE WITH LESS

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Anthony Bellitto Jr.,
Executive Director
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INSIDE:

LOCATION AND LEAK DETECTION



ON THE COVER: Anthony Bellitto Jr. is executive director of the North Penn Water Authority. The utility, headquartered in Lansdale, Pennsylvania, serves 34,000 customers in 21 municipalities. (Photography by James Robinson)



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REBUILDING COMMUNITIES

The efforts of water and wastewater utility teams deserve thanks and appreciation



FROM THE EDITOR

Luke Laggis

The city of Houston is just beginning to dig out from the wrath of Hurricane Harvey as I write this. Some of the city is still under water. Portions are uninhabitable.

As focus shifts to cleaning up and rebuilding, the city is facing another flood — this one bringing hope rather than despair. Countless contractors and other municipal utilities are sending crews to help with the cleanup and to get water and sewer systems back online.

For the most part, however, it will be the local utility people who bear the brunt of rebuilding and restoring service for their customers. They're the heroes who will make it safe for people to return to their homes and communities. It's a huge job, and it deserves widespread appreciation.

I've said it before: You are first responders. You are health care professionals. Your role in community health is as critical as police, fire and

emergency medical personnel. And the situation in Houston is a good example.

Utility workers are going above and beyond, doing everything they can to restore some semblance of normalcy to their communities and give residents the basic services they depend on.

Approximately 2,800 water systems were affected. More than a week after the worst of the storm, 168 utilities still have boil-water advisories and 50 more are completely shutdown. On the wastewater side, more than 300 utilities are only partially operational and 34 are inoperable. The amount of work to get everything back up to speed is incredible and will likely stretch out for many months.

And now, Hurricane Irma is bearing down on Florida. Utilities are bracing for a major impact. The coming days will tell, but the storm could easily rival Hurricane Harvey's destruction.

There's not much I can do from my desk in northern Wisconsin besides tell your stories and be a cheerleader for the vital work you do. But these storms make the importance of your work painfully obvious. When people don't have water service, they quickly realize its importance. And the fact it often takes events like these to cast a light on it speaks volumes about the work you do on a day-to-day basis. It takes a large-scale natural disaster to interrupt service, so it's easy to see how it can be taken for granted.

I don't have any direct ties to Texas or Florida, but I've talked to a lot of utility leaders across those states and have helped tell the stories of their successes. So, in many ways, it feels like it's my friends who are being impacted.

Mostly, I'm just hoping people's lives can get back to normal, and that the work you're doing garners the thanks and appreciation it deserves.

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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STORM RESPONSE

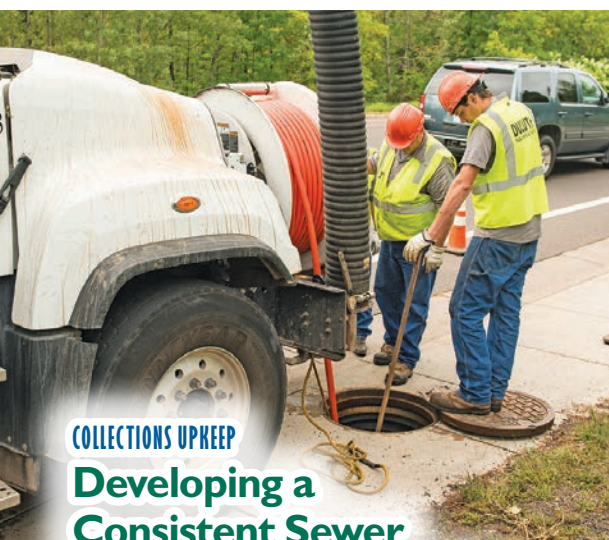
Utilities Challenged by Hurricanes Harvey, Irma

In late August and early September two major hurricanes made landfall in the United States. First, Hurricane Harvey hit Texas' Gulf Coast. Not long after, Hurricane Irma struck Florida. Learn more about how utilities in the two states dealt with the effects of the storms. mswmag.com/featured

OVERHEARD ONLINE

“This is a classic example of why you have to do things right the first time, and sometimes doing them right is more expensive than doing them the quick, cheap way. Had we wrapped those pipes in the 1990s, we wouldn't have a problem today.”

— **Excessive Number of Water Main Breaks Unveils Further Problems**
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COLLECTIONS UPKEEP

Developing a Consistent Sewer Maintenance Program

Maintaining a municipal sewer system is no easy task. The complexities of today's wastewater flows and components coupled with shrinking budgets make the job of a collections system operator one that becomes harder almost every single day. In this online exclusive, Matt Timberlake of Ted Berry Company in Livermore, Maine, shares seven basics of a good sewer maintenance program. They may seem like common sense, but that doesn't negate their importance. Is your utility taking all of these steps? mswmag.com/featured



AERIAL ATTACK

Utility Deploys Drones to Aid in Smoke Testing

The city of Minneapolis is experimenting with a unique method for detecting problem areas in its collections system — drones. As the city is conducting its annual smoke testing — 99 percent of the city's sanitary and stormwater sewers are separated and the city is searching for any leftover connections — it is using drones to get images of hard-to-access rooftop vents. If it proves to be an effective and efficient method for monitoring the smoke testing, additional uses could be found for the drones, according to the city. mswmag.com/featured



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BETTER WATER FOR THE BLACK HILLS

Expanding service in South Dakota's rural, rocky terrain presents economic and logistical challenges for young water system

By Giles Lambertson

In South Dakota's southern Black Hills, where Mount Rushmore honors American presidents on one mountain face and the Crazy Horse Memorial graces another, Don Peterson's job might be the most monumental of all.

Peterson is trying to get clean, quality water to people who, in 2017, still truck water to their rural homes or drink barely potable stuff. Peterson's job is made harder by having to lay 12-inch pipe through the state's oldest rock formations, boost water up and over mountainous slopes, and overcome the bureaucracy of a federal agency.

"We wouldn't have gotten this thing off the ground except for the people who live here," says Peterson, manager of the Southern Black Hills Water System. "Rural water systems are customer-driven. The customers are the ones who make this thing work. They are the ones who benefit."

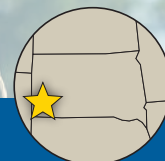
Digging in

The Southern Black Hills Water System is the second-youngest one in South Dakota. It was organized in 2004, about 30 years after formation of the first of 33 rural water systems in the state. It encompasses about 2,000 square miles in the southwest corner of South Dakota — running approximately 50 miles north and south, and 40 miles across — an area that includes such communities as West River, Hill City, Custer and Keystone.

Peterson moved to the western part of the state in 1985 and has managed the Southern Black Hills Water System since its inception.

He's seen the customer base grow to 365 taps. Today, he oversees distribution of 25,000 gallons of water per day and envisions a mature system providing 600,000 gallons daily to 6,000 individual customers. That will be the culmination of 12 phased expansions. "If we get there by 2050, that would be pretty good," he says.

Why so long? First
(continued)



PROFILE:

Southern Black Hills Water System

POPULATION SERVED:

Approximately 900 customers
(365 taps)

SERVICE AREA:

2,000 square miles, southwest
South Dakota

WATER CAPACITY:

25,000 gallons per day

NUMBER OF EMPLOYEES:

3

INFRASTRUCTURE:

120 miles of water mains, one underground reservoir, one above-ground reservoir, three booster stations, six backup generators, two deep wells, one water treatment plant

WEBSITE:

www.southernblackhillswater.com

Southern Black Hills Water System Manager Don Peterson with the system's 125,000-gallon water tower in the background. The system delivers water to residents across Fall River and Custer counties in southwestern South Dakota. (Photography by Kristina Barker)

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there is the land itself. It is a beautiful and rugged region that resists domestication. The area's rocky terrain was formed a billion or so years ago and is infused with granite and other impervious minerals. In the first construction phase, an excavation machine, creating a 6-foot-deep trench for pipe, chewed through some rock at a pace of 1 foot per day. That was the exception, of course. On good days, the trencher progressed 200 to 300 feet.

The Black Hills topography is, of course, hilly. Engineer Ted Schultz of the civil engineering consulting firm AE2S pegs the variation in the system's elevation at 1,500 feet. "That means the system needs a lot more pressure tanks, boosters and storage facilities to operate," he says.

Rising above

With just 120 miles of pipe laid so far, the system already incorporates one underground reservoir, one above-ground reservoir, and three booster stations. Elevating the water in some places requires 285 psi of boosting power. Blizzards also pose challenges — the system lost power for five days in one storm — but the state funded the purchase of backup generators to overcome that problem.

The other obstacle slowing completion of the system is man-made. In 2009, the Southern Black Hills Water System applied for and was granted \$43 million from a federal stimulus bill, the American Recovery and Reinvestment Act. What followed is the stuff of nightmares. After 6 1/2 years and three futile environmental impact studies that cost the water system \$150,000, time ran out and the money was turned back to the U.S. Treasury. "It was a great disappointment," Peter-

son says. "We could have done five more phases of construction with that money."

The U.S. Department of Agriculture and South Dakota Department of Environment & Natural Resources are the system's reliable funding sources. Phase 1 construction was completed in 2010 and cost \$7 million. Phase 2 was completed in 2015 and cost \$11 million. Phase 3 is underway with the utility trying to sign up clusters of customers south of Hot Springs and near the communities of Hermosa, Custer, and Edgemont. "There are good opportunities in front of Southern Black Hills," Schultz says. "Opportunities are there to serve customers in high need of water."

Targeting congregations of potential water customers is a necessary part of extending water through a region with relatively low population density. The eastern part of the state might have four to five customers per mile versus one customer per mile in the Black Hills. For the same reason, the system is acquiring smaller water systems, operating them separately, and hoping to build them out and incorporate them into one system. These small water systems are attracted to acquisition because summertime stresses them when millions of thirsty national park tourists arrive.

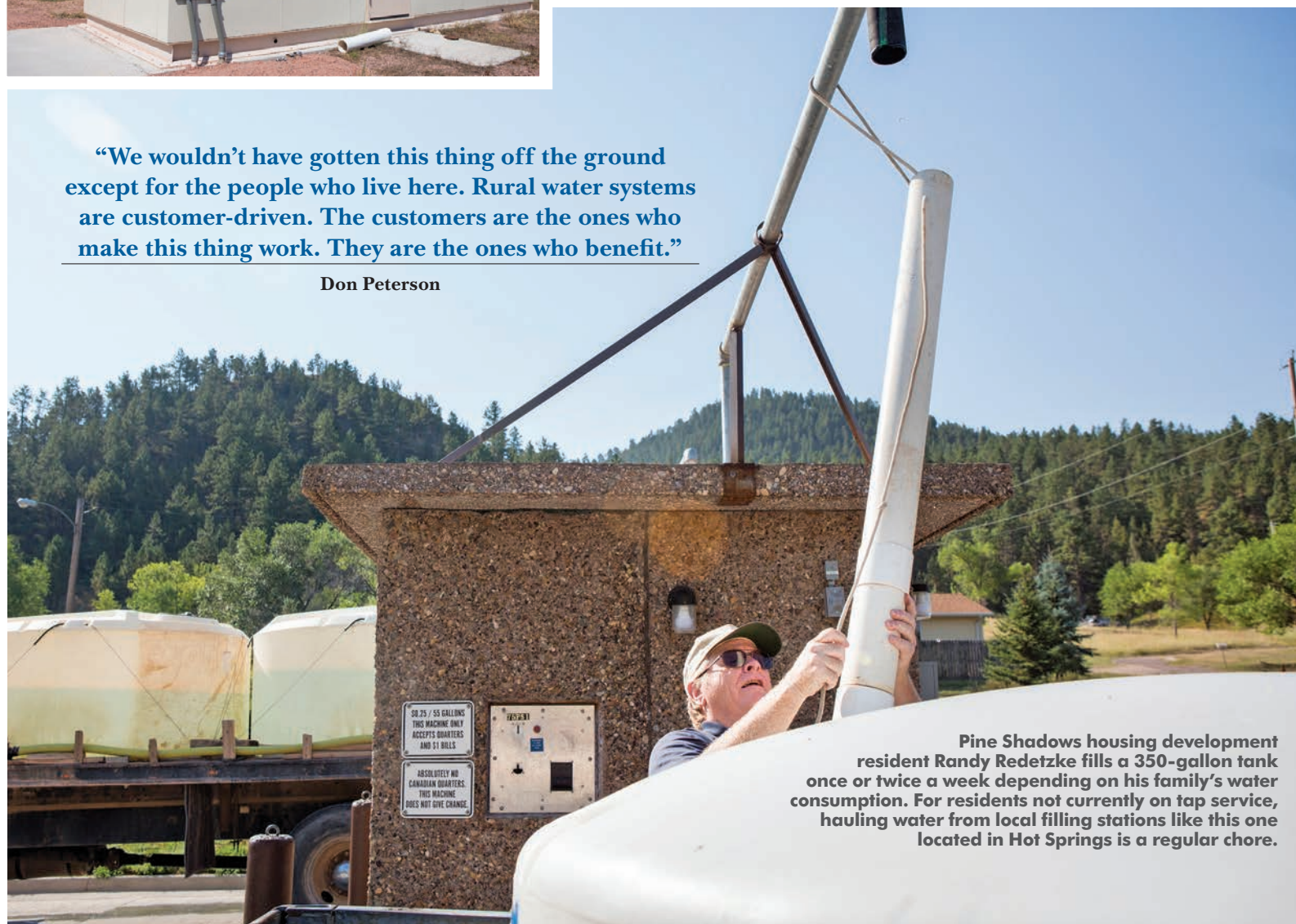
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The Southern Black Hills Water System's Junction Booster Station is one of three such stations that help maintain pressure across a 1,500-foot system elevation variance.

"We wouldn't have gotten this thing off the ground except for the people who live here. Rural water systems are customer-driven. The customers are the ones who make this thing work. They are the ones who benefit."

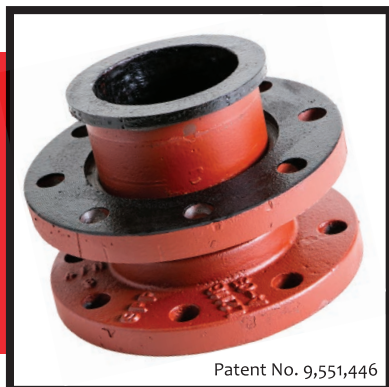
Don Peterson



Pine Shadows housing development resident Randy Redetzke fills a 350-gallon tank once or twice a week depending on his family's water consumption. For residents not currently on tap service, hauling water from local filling stations like this one located in Hot Springs is a regular chore.

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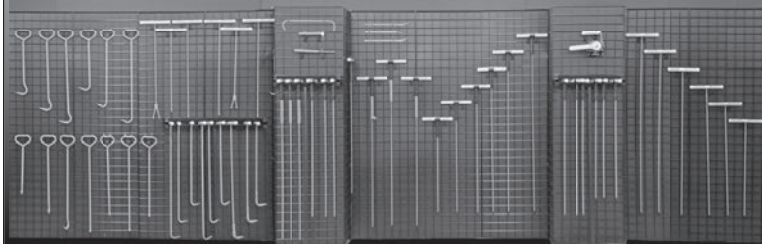


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Black Hills Water System board Chairman Ted Wick at the Junction Booster Station. Now in its 13th year, the water system serves nearly 400 taps.

“Most people know the necessity of water, but they don’t appreciate the value of it. To my way of thinking, \$80 or so a month for water is a better investment than paying \$120 a month for a cellphone or \$150 a month for Dish. If you have to get by with just one thing, it would be water.”

Ted Wick

Hauling water

The rural system will always rely on ground-water as a source, Peterson believes. While irrigation systems for area farmers sometimes draw from dammed pond water, the Madison aquifer is the Southern Black Hills Water System’s source.

The Southern Black Hills Water System’s principal well was drilled in 1949 by a man searching for oil. Instead, he found an artesian water source a thousand feet underground that delivers 109 gallons of quality water per minute. Six miles away, a second well is being completed that taps into the same aquifer and is expected to deliver 300 gpm beginning in 2018. A second high-volume well will be drilled when the customer base grows.

Retired pharmacist Ted Wick is a native of eastern South Dakota who moved to the Black Hills 22 years ago. He drilled a well on his property south of Hot Springs on Cascade Road and draws sufficient volume to water young trees on his acreage. Drinking it is not a top choice, however, even after it is softened and filtered several times. Nine years ago, he became a board member of Southern Black Hills Water System and, now, he is chairman.

“Some close neighbors have wells like mine, but half a mile up the road, people have to haul water,” Wick says of his neighborhood. He is liable to encounter haul trucks on the road about any time of the day, every day. Some community systems sell hundreds of thousands of gallons of water each year to haulers, who download at coin-operated “water docks.”

Building a base

Wick’s neighborhood is one being solicited in this phase of expansion. He believes hooking onto the system should be an easy sale. “It is a matter of changing people’s thinking,” he says. “Some people on Cascade Road have been hauling water for 30 or 40 years. I think they will pick up on this opportunity. Most people know the necessity of water, but they don’t appreciate the value of it. To my way of thinking, \$80 or so a month for water is a better investment than paying \$120 a month for a cellphone or \$150 a month for Dish. If you have to get by with just one thing, it would be water.”

EXPANSION HURDLES GO BEYOND GEOGRAPHY

Building out a water system in a rural and scenic area can be a tense business. Environmental objections and fear of suburbanization put such projects at risk. The Southern Black Hills Water System officials know this well.

“One thing we face in western South Dakota is the U.S. Forest Service,” says Don Peterson, system manager. The Black Hills forest is the largest of three forests in the state. “When we cross their property, that’s when we get involved in environmental things.”

Actually, crossing the property isn’t the only time there’s pushback: Running a waterline along a highway right-of-way that bisects Forest Service property is enough to trigger a request for a study.

Southern Black Hills officials are reluctant to say too much about the relationship with the Forest Service for fear of cankering relations further, but it is a burr under their saddles. When the system lost out on \$43 million from the federal stimulus bill of 2009 after six years of wrangling, part of the reason was Forest Service resistance. “When you are sitting across the table from a man who says we are going to dump a bunch more hurdles in your path — this is from someone whose salary we all are paying — it’s a difficult thing to stomach,” Peterson says.

Ted Wick, Southern Black Hills Water System board chairman, was also not pleased. “That cost us a lot of money and time, and to my mind, they never could really justify why they were doing it. I mean, this is water, not oil. Even if there was a leak, it would be water running down a ditch. My perspective is that some of those people just don’t want any more people moving into the Black Hills.”

System officials note that some fiber-optic and heavy power lines have been granted permission to cross through the forest land, so why not water? “In Phase 2, we sought permission to cross along the path where a phone company ran lines,” Peterson says with some exasperation. “The Forest Service wouldn’t accept the environmental study that the phone company did one year prior.”

Congressional support has consistently been there for the water system, and other federal agencies have helped. As the system continues to enlarge its footprint in the region, officials say they are hopeful the new administration will be more supportive. And, Wick adds, “I would say, if the Forest Service keeps holding us up, we may have to try to get more leverage from Congress.”



New pipe lies on the ground where the Southern Black Hills Water System is expanding service to new customers. Rugged terrain has made development challenging and costly.



The system has instituted an incremental fee system to induce people to sign up in advance so a large enough customer base can be accumulated to warrant running a line. A “good intention” fee of \$150 is levied just to put a customer on the map. Once enough pins dot the map in a targeted area, construction begins and sign-up incentives really kick in. People who balk at signing up because they consider a rural water system to be, in Peterson’s words, “a pipe dream” pay dearly for their hesitation.

“When construction begins, each person pays \$1,500 to become an actual water customer,” Peterson says, in addition to footing costs of running laterals. During construction, if unsigned property owners along the route see actual construction occurring and come out with check books wanting to be part of the system, then at that moment, they are charged \$2,500 for the privilege. If a property owner waits until after the pipeline-laying crew passes his property, the fee jumps to \$5,000.

“The next challenge the system is going to face is financing. That’s what I see. We can overcome the terrain. It is the financial part that challenges us.”

Ted Schultz

“I have had some people pay as much as \$25,000 to connect up late,” Peterson adds, which still is less than the cost of drilling a well that may or may not pan out. “Early commitment is a benefit for everyone — for the system and the customer.”

Funding growth

Seven years ago, a \$900,000 treatment plant was built near the initial well. The water is of such good quality that the plant’s only function is to chlorinate the product coming out of the ground. A second treatment plant is anticipated near the second well, where a reservoir has already been constructed. Such capital investments are costly, and cost continues to cast a long shadow over the project.

Wick believes funding is the system’s next big challenge. “Borrowing money from the federal government makes a project more expensive, even when it is a low-interest loan paid back over many years. However, the state and feds are supportive if we can make the numbers work for them.”

Schultz concurs: “The next challenge the system is

going to face is financing. That’s what I see. We can overcome the terrain. It is the financial part that challenges us.”

But Peterson is pretty sanguine about such financial obstacles, continuing to bank on the support of individuals and officials in the region.

“There is a lot of support for this, from mayors and town councils,” he says. “We have some antis, but the majority of people get excited when they see us coming their direction. When they see the trencher, that’s when people really get excited.” ♦

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SEEING BELOW THE SURFACE

Understanding how high-tech utility locators work is the first step in protecting your underground assets

By Ken Wysocky



The most commonly used locating systems use two basic components: a transmitter and a receiver (a hand-held wand). The transmitter sends current through a line, and the receiver detects the resulting electromagnetic waves, or frequencies, produced by that current.

A utility locating technician is a magician of sorts, slowly waving a wand through the air to determine the precise location and depth of a buried utility line — all while enhancing job site safety and productivity. Pretty neat trick, right?

Of course, these are technicians, not magicians, and they're wielding some impressive technology. But to the uninitiated, understanding and using these high-tech instruments can seem daunting. Transmitters, receivers, grounding stakes, milliamps, as well as hertz (Hz) and kilohertz (kHz) frequencies — how does it all work?

The basics

As confusing as it may appear, it all boils down to one simple thing: magnetic fields. If you think back to middle school science, you'll no doubt remember that electricity produces magnetic fields; and that forms the basis for utility locating.

"It all works off magnetics," says Matt Lumbers, product manager for Subsite Electronics, a division of The Charles Machine Works Inc. "Anytime electric current flows, it produces a magnetic field."

To understand how locators work in concert with these magnetic fields, let's start from the beginning. The most commonly used locating systems use two basic components: a transmitter and a receiver (a hand-held wand). Both are battery-powered. The transmitter sends current through a line, and the receiver detects the resulting electromagnetic waves, or frequencies, produced by that current. The receiver is capable of picking up a wide range of frequencies, typically ranging from a low end of 256 Hz to a high end of 83 kHz (or 8,300 Hz).

There are two different kinds of locating methods: active and passive. In active detection, you create current by connecting a transmitter directly to a cable or pipe. With passive detection, you're tapping into pipelines (typically metallic power lines) that create their own magnetic fields or currents. Other types of pipes, such as plastic gas lines, are installed with jacketed lines called tracer wires that conduct electric current.

If tracer wires weren't installed, other options exist. For instance, you could send a signal-generating device called a sonde through a pipeline via a cable. The wand detects the sonde's location. "If this is not possible, then you can use ground-penetrating radar (GPR), which can see nonmetallic objects underground," Lumbers says. "But this technology is very soil dependent and expensive, which is why it is not used very often."

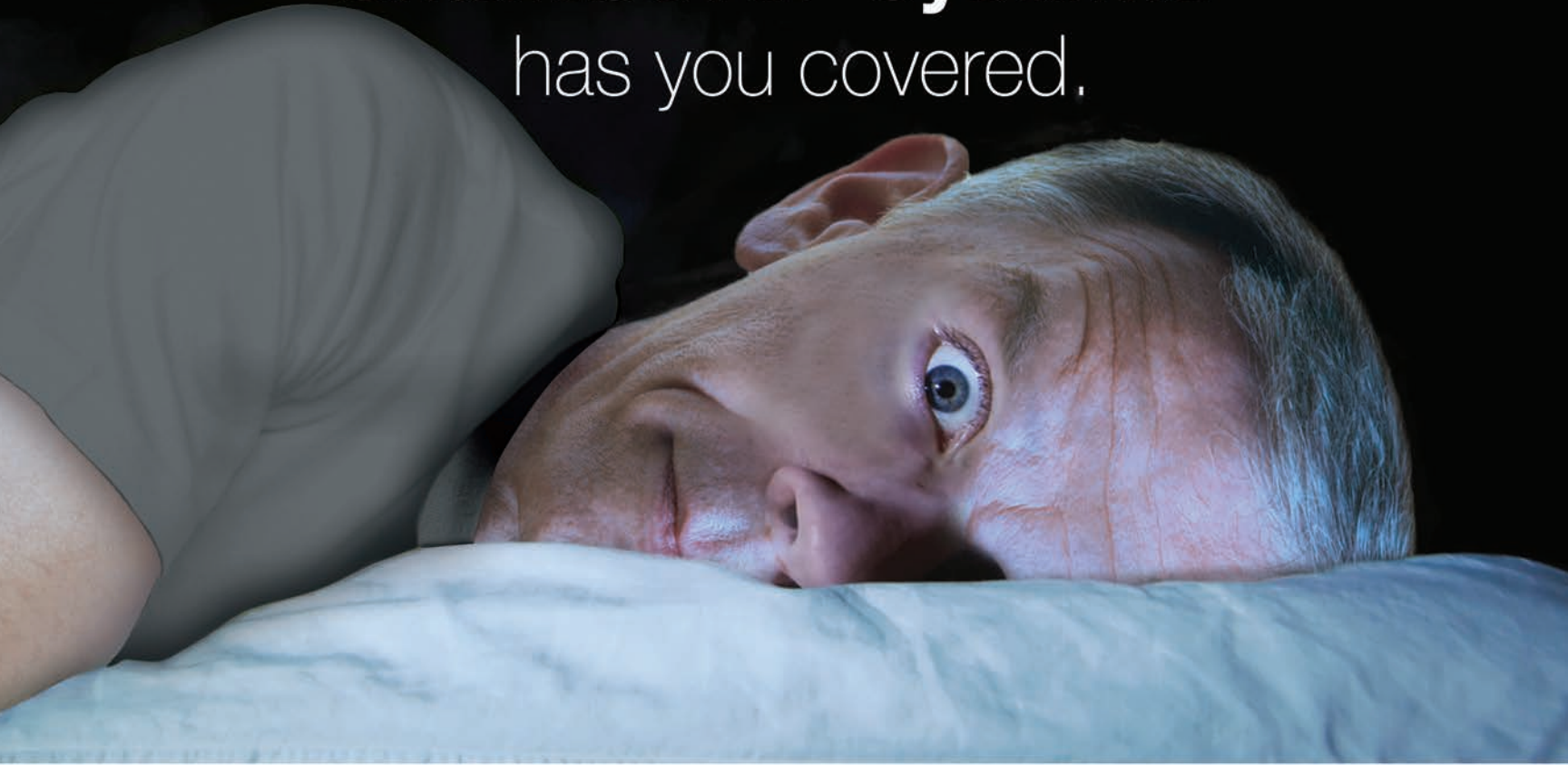
Getting connected

The most common form of utility locating — known as conductive mode — is done with direct-connect cables that resemble jumper cables, with a red lead and a black lead. To begin, plug the direct-connect cable into the

(continued)

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transmitter, and then connect the black lead to a ground stake and the red lead to the pipe you're trying to locate, or perhaps a meter to which it's attached. In other instances, you might connect the red lead to a pedestal in a utility right-of-way, Lumbers says.

Proper grounding is important: The better the ground, the stronger the signal. As such, it's best to locate the ground stake as far as possible from the expected trace path. Placing the ground stake at a 90-degree angle from the trace path is your best option.

Next, turn on the transmitter and choose a low frequency for starters, and then set the wand to the same frequency. Look at the wand's milliamp reading to verify good continuity; the higher the milliamp reading, the better the connection.

Why start at a low frequency? A lower frequency is not as prone to "bleeding off" onto other nearby lines, which is critical in an area congested with underground infrastructure. To locate gas pipes, for example, start around 815 or 870 Hz, Lumbers suggests.

After choosing a frequency, move about 25 feet away from the transmitter and walk in a circle. As you do so, look for a peak response on the wand, which is indicated both numerically and by a change in a tone emitted by the wand. The pitch goes higher when you're directly above the line you're seeking, he says.

After you find a peak signal spot, follow the expected trace path. Every 5 feet or so, move the wand from side to side to ensure you're following the peak signal path. Do this for as long of a distance as needed. If the signal suddenly weakens, the pipeline probably changed direction. Arrows on the wand's display panel will guide you back, Lumbers says.

If no pipe is located at the initial frequency setting, then work your way up the range of frequencies. "Think of the frequency range as a target where you're starting at the center ring, which is 256 Hz, and moving outward," Lumbers explains. "The next stage is midrange frequencies, which typically range from 8 to 33 kHz. And if that doesn't work, try going up to 44 kHz."

Soil conditions can also affect utility detection. For example, drier soils make it more difficult to ground a detection system. The workaround? Pour a saline solution around the ground stake or moisten it with water, Lumbers advises. "Wetter soil is always better."



Poor ground connections or bad ground placement are two of the most common rookie errors in utility locating. Incorrect frequency selection — starting on the high end, for example — is another common mistake.

Common errors

Poor ground connections or bad ground placement are two of the most common rookie errors in utility locating. "If you're working in an area with multiple utility lines and place a ground stake over a telecom line, the wand may recognize both that line and the gas line you're looking for," Lumbers says. "That will result in bleeding off — you won't isolate the line you're trying to find."

Incorrect frequency selection — starting on the high end, for example — is another common mistake. "If I can successfully locate that utility using a lower frequency, then I don't have to change to a higher frequency that's more likely to bleed off," he says.

You can expect to spend anywhere from around \$2,500 to \$8,000 for a utility locating system, depending on features and accessories. To get a good return on investment, consider brands that offer features such as longer battery life, remote control operation for changing frequencies, and dual-output units that allow you to locate two lines simultaneously. All these features improve productivity and efficiency, Lumbers notes.

Given the complexity of the technology, are these locator systems difficult to operate? Not with proper training, he says. "It's not difficult for me, and I'm not an engineer. If I can do it, anyone can."

Trust, but verify

When utility workers use locators, they're typically verifying the work already performed by contracted utility locating services. Isn't that just wasteful duplication of services? Not really, explains Lumbers.

"Just because someone puts paint on or flags in the ground doesn't mean they're accurate," he says, referring to the color-coded paint marks or flags used to mark utilities. (Red indicates electric power lines, green refers to sewer lines, yellow marks gas lines, blue indicates waterlines and orange points out communications lines.) "Plus, they have a margin of error that ranges from 18 to 24 inches on each side (of the markings or flags). Moreover, their markings don't tell you the exact depth of the lines."

"One issue we have in the field is that contract locators get paid by the ticket," he continues. "The more tickets they get done, the more they get paid, so it's all about speed. So if I pull up on a job site, the first thing I want to do is verify the utility location and its depth."

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DOING MORE WITH LESS



North Penn Water Authority accommodates significant growth and becomes a model of efficiency and dependability for its customers

By Giles Lambertson

North Penn Water Authority meter department supervisor Steve Reber tests water meters for residential and commercial properties. (Photography by James Robinson)



PROFILE:

North Penn Water Authority

POPULATION SERVED:
34,000 customers

SERVICE AREA:
21 municipalities, 100 square miles

WATER CAPACITY:
40 million gallons per day

NUMBER OF EMPLOYEES:
49 full time, four part time

INFRASTRUCTURE:
575 miles of water mains,
11 above-ground water storage tanks,
15 production wells, nine booster
stations, one water treatment plant
featuring 45 million hollow-tube filters

ANNUAL BUDGET:
\$20 million

WEBSITE:
www.northpennwater.org



Erwin Hunsberger (left) and Angelo Cosentino work on a 3/4-inch sample service for the Lawn Avenue storage tank.

Winning awards is one thing. Staying ahead of the curve is another. The North Penn Water Authority in suburban Philadelphia has managed to do both while also dramatically shrinking its staff.

Headquartered north of Philly in Lansdale, Pennsylvania, the North Penn Water Authority is a municipally owned, nonprofit agency founded 53 years ago to improve the reliability of the region's drinking water supply. Seven communities came together in 1965 to meet the needs of 7,000 water customers. Today, the system has 34,000

North Penn Water Authority officials are confident the mature system's capacity is more than sufficient to meet current and future needs.

Securing a source

This progress did not occur without struggle. In the beginning, the fledgling organization relied on groundwater to meet customer requirements, developing dozens of wells. It wasn't enough. Shortages occurred throughout the 1970s and 1980s, including periods when water-use restrictions were imposed. Not until 1989 did the North

“We wanted to be the first to win the award and help establish a new expectation of what it means to provide safe, quality water.”

Anthony Bellitto Jr.

customers in 21 municipalities. Along the way, North Penn Water Authority reinvented its water sourcing, dodged a bullet named Hurricane Sandy, and figured out how to do more with less.

“I would say that, back in the 1960s, the Authority could not have anticipated all the growth we've experienced,” says Anthony Bellitto Jr., the organization's executive director since 1998. But successive generations of North Penn Water Authority board members and management have overseen systematic expansion of the system as townships filled up with residential and commercial properties. In 2017, water demands continue to grow, albeit at a slower pace, and

Penn Water Authority find a permanent solution by tapping lake water and supplementing with water pumped out of the Delaware River, as well as by constructing an interim treatment plant with a capacity of 3.2 mgd.

The era of chronic water shortages ended with the building of a permanent, state-of-the-art treatment facility called Forest Park and a move away from reliance on groundwater. From a high of 73 wells, North Penn Water Authority now operates just 15 production wells and relies on surface water for 90 percent of its supply.

In keeping with the suburban character of the region, 80 percent of the North Penn Water



“We needed to upgrade the plant and took note that the EPA was on track for more stringent regulations, so we decided to look for the most advanced filtration technique. It was well worth the investment.”

Anthony Bellitto Jr.

Christian Nellet (top left) and Angelo Cosentino clear dirt from a pit while installing a 3/4-inch sample service connection.

Authority’s customers are residential. But the other 20 percent is split among commercial and industrial customers, including pharmaceutical and meat-packing facilities that use a significant volume of water. To supply it, the Forest Park plant now typically churns out 30 mgd and close to 40 mgd on peak demand days. Confidence is born of such numbers. “We have no more shortages and no more problems in meeting growth in the area,” Bellitto says.

Industry takes notice

The North Penn Water Authority’s success is being recognized. In 2012, the treatment plant — which is owned and operated by North Penn and North Wales water authorities — received the American Water Works Association Presidents Award as part of the Partnership for Safe Water. Two years later, the Pennsylvania Department of Environmental Protection handed the treatment plant the Area-Wide Optimization Program Award for its “outstanding efforts” to remove turbidity from its water. The plant has earned the honor more than once.

This year, the utility received two more significant recognitions. The AWWA’s Distribution

System Optimization Program Directors Award of the Partnership for Safe Water was bestowed on North Penn Water Authority for excellence in water distribution “above and beyond” regulated safety standards. The North Penn Water Authority became the first public water utility in Pennsylvania and among the first in North America to meet the rigorous standards for the award, which includes a peer-reviewed comprehensive self-assessment of operations.

Bellitto is a licensed professional engineer. He says the North Penn Water Authority earned the Directors Award before any other system in Pennsylvania because the board and management targeted it. “The award is a recent development in recognizing excellence. The AWWA wisely said, ‘Great — you’ve optimized water at the source. But how about in the distribution system?’” The award acknowledges “the whole dynamic of moving the water. We wanted to be the first to win the award and help establish a new expectation of what it means to provide safe, quality water.”

The other formal recognition of excellence came to Bellitto himself. He received the AWWA’s Samuel S. Baxter Award for outstanding leadership and service in the cause of safe public drinking

water. The award recognizes that Bellitto is ultimately responsible for all of the North Penn Water Authority’s planning, engineering, operational and financial functions. Thus, the North Penn Water Authority’s success was inextricably linked to his performance.

Investing in the future

Water systems are capital-intensive operations. Lots of hardware and infrastructure collect and move the water and need constant replacement or refurbishment. The North Penn Water Authority includes 11 above-ground water storage tanks, 575 miles of water main, nine booster stations, collection pumps that move 10 percent of the supply, and 15 production wells. Though growth of the customer base has slowed to 2 to 3 percent from 8 percent or so in previous years, “bulk sales” are growing at a much higher rate, so the system components continue to be constantly stressed. A bulk sale of water occurs when water is transmitted to a large-volume user outside the 100-square-mile system.

The heart of the North Penn Water Authority system is the Forest Park Water Treatment Plant. The plant was expanded 10 years ago and retro-

(continued)

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John Myers (left) and Rob Averitt exercise water system valves in a residential neighborhood using a Wachs TM-7 valve exerciser.

STANDING UP TO SANDY

Every water authority experiences a crisis at one time or another. One crisis that threatened the North Penn Water Authority came in October 2012 when Hurricane Sandy swirled along the East Coast with damaging winds and storm surges.

Pennsylvania officials declared a state of emergency, and the mayor of Philadelphia asked residents in low-lying areas to move to safer ground. After the storm wreaked havoc, electricity providers brought in crews from as far away as New Mexico to restore power.

The area in which North Penn Water Authority operates lost electrical power for four days. The good news was that no North Penn Water Authority customers lost service because the North Penn Water Authority had anticipated just such a crisis. In 2007, it had installed a diesel-powered backup generator for its Forest Park Water Treatment Plant. The generator was in addition to two separate electrical feeds to the plant, which were duplicated as a fail-safe measure in case one line failed.

"It was a very good thing that we installed the generator, of course," Executive Director Anthony Bellitto says. "I cannot imagine how disastrous it would have been had we not had use of that plant for four days."

The generator installation cost North Penn Water Authority \$1.5 million dollars. "We have put a lot of money and time into developing redundant systems. We had redundancy at the plant, and as luck would have it, we needed it when Sandy struck. Instead of responding to unexpected events and emergencies like that storm, redundancies in the system let us anticipate them."

Some 15 million gallons of water were processed each day for four days using the generator, with employees performing many functions manually after remote control components were rendered inoperative by the storm.

"A water treatment plant is like a hospital," Bellitto says. "It can never go down."

fitted with a membrane filtration system, which is deemed the most advanced process available and is more commonly used in Europe than in the United States. "We needed to upgrade the plant and took note that the EPA was on track

maintenance — nearly \$7 million in 2016 alone. That level of investment was more than offset in 2016 by operating revenue and nonoperating income totaling nearly \$40 million. The number was skewed by a one-time payment of \$15 million from a water system 17 miles away that began buying capacity for 10 mgd, an example of a bulk sale. "The one-time payment was for a share of our previous capital investment," Bellitto says. "They would have had to spend a lot more to

"We are as lean as we can possibly be because we are conscious that we're a nonprofit agency and need to strive for zero waste and high utilization of staff members. We're really proud of being able to do that."

Anthony Bellitto Jr.

for more stringent regulations, so we decided to look for the most advanced filtration technique," Bellitto says. "It was well worth the investment."

The system incorporates 45 million hollow-tube filters that remove any impurities larger than 0.1 microns from already clarified water. The method is considered the best option for eliminating microscopic particles. Forest Park water is then treated with ozone gas and receives a couple other treatments before being chlorinated and collected in a 2-million-gallon underground reservoir.

To keep the plant humming and water flowing, North Penn Water Authority spends millions of dollars annually on equipment, operations and

build their own treatment plant."

Other expenses include installation in 2007 of a backup generator for the treatment plant — a critical component after Hurricane Sandy struck — and creation of 15 interconnections to neighboring water systems. These water-exchange points are mutually reassuring because each entity is able to give or receive water as needed in an emergency. The generators and intersystem connections are a corollary to numerous redundancies built into the North Penn Water Authority system. For example, in 2016, the North Penn Water Authority spent \$1.5 million for a second transmission main from Forest Park to the system.

The North Penn Water Authority operations department staff includes (from left) Rob Averitt, Mike Bush, Bill Wooler, Harold Wesner, Bill Hoffman, John Myers, Jim Sharayko, John Dickinson, Christian Nellett, Erwin Hunsberger, John Boyce, Angelo Cosentino, Sean Rogers, Bryan Reimel and Dan Beiler.





Angelo Cosentino connects a new water service.

"The larger we grow, the more important these redundancies become," Bellitto says. "The biggest vulnerability we had was having just one mainline running from the treatment plant to the service area. It cost money, but it really works out for us in terms of reliability."

Less is more

Growth and redundancy do not carry through to staffing. Twenty years ago, 70 full-time staff members were employed by the North Penn Water Authority. Today, Bellitto has a staff of 49 full-time employees, four part-time employees, and a couple of college interns during summer months. Management is a staff of eight, with eight supervisors answering to them and overseeing 22 people in the field. This staff shrinkage has occurred despite the system's growth in customers, water distribution and miles of main.

"We've been very good at streamlining and making ourselves an efficient organization," Bellitto says. He cites automation of such tasks as meter reading as well as cross-training of employees. "We are as lean as we can possibly be because we are conscious that we're a nonprofit agency and need to strive for zero waste and high utilization of staff members. We're really proud of being able to do that."

Bellitto credits the 10-member board for working together harmoniously in their oversight and decision-making. "Whenever you get 10 people together representing 10 different communities,

it can be a challenge, but our board works together well, and members have developed good relationships. They are appointed by their communities but approach their board work with a collaborative spirit."

Dealing with customers and the public is the biggest challenge. "The easier part is getting water from point A to point B. We have technical people who can do that in their sleep. I know water is going to get to our customers in a reliable way. The bigger challenge is dealing with misinformation."

Bellitto and his public relations aides encourage customers to call the office if they have water concerns or questions about their bills.

"We want them to call. We encourage dialogue with our customers." ♦

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MANAGING A BAD BOSS

If a difficult supervisor is making your work life miserable, it's time to learn how to 'manage up'

By Ken Wysocky

If you dread going to work every day because your boss is — in a word — bad, maybe this will provide a little solace: You're not alone, not by a long shot.

For anecdotal proof, Google the phrase "my boss is killing me," then make yourself some coffee and start perusing the 2,990,000 results. Or, consider a recent survey conducted by Monster.com, a global employment website, which found that 32 percent of employees rated their bosses as "horrible." Moreover, 50 percent of the 2,555 respondents gave their immediate supervisor a ranking of one or two on a scale from one to five, with one being "horrible" and five being "excellent." In stark contrast, only 15 percent described their manager as "excellent."

Moreover, no less an expert than Jim Clifton, the chief executive officer of the noted analytics firm Gallup, conservatively estimates that there are millions of bad managers wreaking havoc on the American workplace. He bases that determination on Gallup's periodic State of the American Workplace polls that consistently find a majority of American workers — about 70 percent, according to the latest survey — aren't engaged at work, which Clifton views as a direct indictment of managers' collective deficiencies.

But while misery may love company, it doesn't do much to make your day-to-day work life any better. Dana Brownlee, a well-known corporate-training consult and founder of Professionalism Matters, suggests taking another more proactive route: manage up.

"From what I hear anecdotally (at training sessions and seminars), you're lucky to have one or two amazing, phenomenal bosses in your career," Brownlee notes. "They're like unicorns. In my training sessions, I get a lot more questions about dealing with bad managers

"Typically, employees think about doing their jobs," she adds. "But unless you're at the top of the food chain, you need to manage: find a way to achieve the best results in spite of a difficult manager. Making life easier for a manager — taking things off their plate and anticipating their needs — all falls under the umbrella of managing up. People who fly up the promotional ladder tend to be good at this."

To provide more specific solutions for boss-challenged employees, Brownlee offered some strategies for managing up with three common kinds of bad managers.

Tornados

The first one earns the moniker the Tornado — a force of nature that likes to think he or she empowers staffers but instead runs roughshod over people during meetings, stifling new and innovative thinking.

Brownlee's solution centers on holding a meeting with the manager before a big meeting. The purpose: to solicit the manager's advice about how to obtain more candid feedback from a team. Like so many things in life, it's all about context. If you go in and try to tell your boss what he or she needs to do, the reception may be lukewarm at best. Instead, be more strategic about your approach, she suggests.

"You can point out how hierarchy makes a difference and that people tend to defer to what the boss thinks," she says. "Tell your boss that you're struggling with how to challenge the team to come up with new and interesting ideas."

This softer, more preventive approach makes the boss still feel a

sense of control over the matter. Equally as important, it preserves your relationship, too. "It also gives the manager the opportunity to be the coach — the expert or problem-solver," she adds.

Wishful Thinkers

Then there's the Wishful Thinker who wants you to boil the ocean — by end of day tomorrow, please. (Or, at the very least, clean 3,000 feet of sewer line in one day.) Dealing with this brand of manager requires doing some due diligence about the mission impossible with which you've been tasked. That means collecting data showing that the project the boss unrealistically believes is a slam dunk will actually take a lot more time, resources and money than imagined, Brownlee says.

"The Wishful Thinker might not suffer from a personality defect," Brownlee points out. "It may be more of a case where the further up the

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

"You have to do what feels the most authentic — customize your approach to fit the person with whom you're dealing, and do some relationship-building along the way."

Dana Brownlee



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food chain you go, the more removed you get from the day-to-day work, which distorts assumptions about things.” It helps if you can gather objective data from a representative cross section of employees. “Getting together with all the subject matter experts helps to quantify the risks of the project and makes your information more credible,” she says.

Clueless Chameleons

Then there’s the Clueless Chameleon — the supervisor whose best skill seems to be giving vague or confusing directions, or whose priorities shift more often than a NASCAR driver at the Daytona 500. This requires you to proactively probe with specific questions that help ferret out details omitted during the initial assignment.

“The danger here is that just because managers aren’t clear about what they want doesn’t mean they won’t hold your feet to the fire in the end when their expectations aren’t met,” Brownlee says. “If you’re not getting clarity, you have to pull it out of them.” Perhaps that requires making a mock-up of a report or spreadsheet or an outline of a project and asking for feedback, just to be sure you’re headed in the right direction, she suggests.

“I also tell people to ask the three magic questions: what is your manager’s understanding of the task (be sure to repeat it back to them for verification), what will the final deliverable look like, and what are the first three steps you’re going to take?” she says. “These steps are helpful because your vision of what constitutes a business plan, for example, might be different from your manager’s vision of one.”

In other instances, this kind of manager may even be unsure of exactly what he or she wants, due to lack of experience or skills. If that’s the case, working the manager through a process of elimination to find out exactly what they’re looking for can be helpful, Brownlee points out.

Be authentic

In the end, it’s how you express things that count. Managing up requires employees to walk that thin line between Eddie Haskell-esque brown-nosing and flattering, and overtly telling someone stationed at a higher pay grade how to do their job. And yes, it may feel uncomfortable at first as you step out of a certain comfort zone and try to be more proactive about the process.

“It’s not about sticking your nose into things you shouldn’t be,” Brownlee cautions. “I’m not talking about going in and trying to do your manager’s job. But when you’re put in a situation where you know there’s a problem and you’re not getting a lot of support, you still want to be successful. In fact, the more successful you are, the better it is for your manager.

“So you have to find the right approach. ... And there’s no one-size-fits-all solution,” she continues. “You have to do what feels the most authentic — customize your approach to fit the person with whom you’re dealing, and do some relationship-building along the way.”

During the process, you’ll learn new skills that will serve you well throughout your career. As Brownlee observes, it doesn’t take any extraordinary amount of skill to be successful when you have an amazing manager. “But it requires another level of sophistication to be successful when you’re saddled with one of these types of bosses,” she says. “And the skill sets you develop will serve you wherever you go. I call it organizational savvy. It’s an element that’s hard to define, but it makes a huge difference in how successful you can be in an organization.” ♦



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GUIDED BY TECHNOLOGY

Schwalm USA robots give sewer technicians the ability to perform a variety of tasks with simple joystick operation

By Luke Laggis

Sewer cleaning, inspection and rehabilitation technology is evolving at a rapid rate. While robots aren't likely to take over the world as some sci-fi movies would have you believe, they are certainly taking on a greater role in our collections system infrastructure.

Schwalm USA is one of the companies leading the robot revolution. The company's sewer robots have been tested and proven in Europe, and now, they're adding to the capabilities of sewer technicians stateside.

The Schwalm USA Talpa FSR robot, available in two models to accommodate a wide range of pipe sizes, is the latest tool available for sewer rehabilitation work. *Municipal Sewer & Water* recently spoke with Schwalm USA President and General Manager Ken Cochrane about the robots and the capabilities they provide.



The Schwalm USA Talpa FSR robot is designed to handle a variety of tasks, from lateral reinstatement to concrete removal, high-pressure waterjetting, and even plugging lateral lines.

TECH CLOSE UP

PRODUCT:
Talpa FSR robots

MANUFACTURER:
Schwalm USA
864/414-9658
www.schwalm-usa.com

APPLICATION:
Sewer cleaning, inspection and rehabilitation

BENEFITS:
Adding to the capabilities of sewer technicians

MSW: The Talpa FSR robot has been available in Europe for a while now. Why is it just now being introduced to the U.S. market?

Cochrane: The new structure of Schwalm USA allows us to operate strictly as a robot company that has robots in stock, a service center, and field training. We have more than 100 already operating inside of North and South America.

MSW: What types of tasks and functions are this system designed to handle?

Cochrane: The system has been designed to make it not just a CIPP cutter, but also a robot used for repairing lateral, chiseling concrete, high-pressure waterjetting, and using a plug system to close off laterals that are no longer in service or to temporarily close off laterals for repair and rehabilitation.

MSW: What range of pipe sizes is the system designed to serve?

Cochrane: There are actually two different Talpa robots: the 2060 and the 1330. The 2060 is used in pipes 8 to 24 inches in diameter. With attachments, it can also be used in larger pipes. In fact, it's versatile enough to use in egg-shaped and teardrop pipes when utilized with a specially designed carriage and stabilizer system.

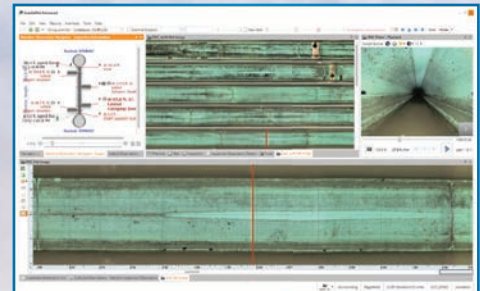
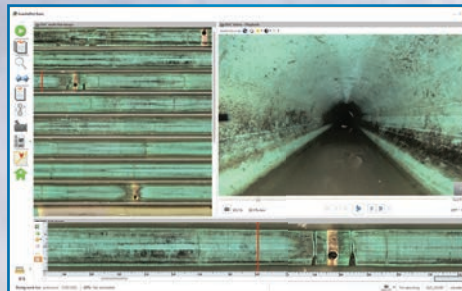
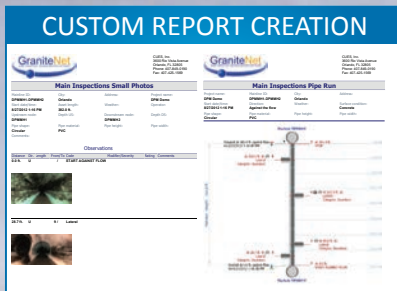
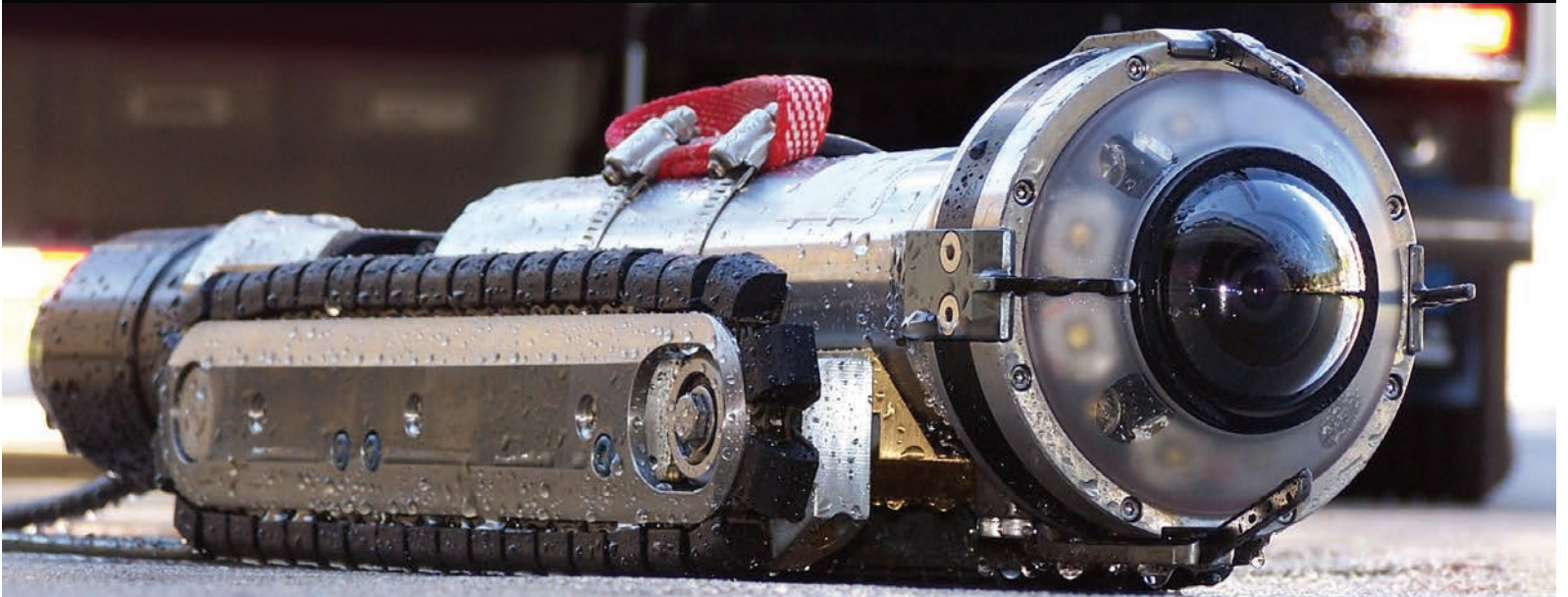
The 1330 model is pretty straight forward and is used in 6- to 12-inch pipe.

MSW: How does the operator control the system during operation?

Cochrane: The robots are controlled by a joystick system linked to the main control unit. The operator trained on the joystick learns the process quickly because of the unit's intuitive handling. Essentially, every single robot movement is initiated

(continued)

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using the joystick. Speed, acceleration and movements are in the same direction as the corresponding joystick position, giving the operator a natural feeling for handling the robot.

MSW: What type of operator training is required to use this system?

Cochrane: Most of the operators who are being trained on the system have already been in the industry for some period of time and have experience in either cutting or TV work. It then becomes just a matter of them getting used to the controls. We try to spend at least three days with them after the install of the equipment to give them training on operations of the system and also basic maintenance.

MSW: What features does the camera offer?

Cochrane: We have two different types of cameras available with the system: the MiNa Focus Camera, which is mainly used during the cutting process, and the MiMoZo Zoom Camera, which is used during the actual rehab work.

MSW: How is video footage recorded and stored?

Cochrane: The standard Schwalm USA system has a video out on the control unit, which is relayed to a computer and recorded. It also has the ability to connect with several different types of inspection software. You can connect a Schwalm USA Talpa to another system, such as CUES or Aries Industries, and the video will go directly into that system's inspection software.

MSW: What equipment is included with the system?

Cochrane: It all depends on what the customer is looking for. There are stand-alone systems that come with robots, control units, cable reel, air/water hose reel and accessories. Or, it can be adapted to a lot of CCTV systems that have existing reels in place. This enables the customer to get into a robot system at a much better price because there is no need to have two reel systems in their vehicle.

MSW: What additional tools and accessories are available?

Cochrane: There are several different tools available for the robots. We offer a plug system for closing off laterals, either permanently or temporarily. We've got angle grinders for the removal of metal rods or liners. We sell a high-pressure waterjetting system for the removal of slurry, concrete or roots. We even have an air chisel for breaking up concrete and calcium deposits.



The Talpa FSR robot is available in two models, the 2060 and I330, to accommodate a wide range of pipe sizes.

MSW: How easy is it for the operator to switch out the tooling or attachments? What is needed to do this?

Cochrane: It's really quite simple and pretty fast. The design of the robot's tool holder allows an operator to change out tools in a matter of minutes. All that is typically needed is an Allen wrench.

MSW: What is the difference between the 2060 and I330 models?

Cochrane: From a performance and durability standpoint, they are the same. The only real difference is the range of pipe sizes they can operate in.

MSW: On the 2060 model, what are the differences in the two camera options?

Cochrane: The MiNa Camera is a focus camera that is typically used while doing cutter work. And the MiMoZo is a zoom camera that will typically be used for the actual rehab process.

MSW: What differentiates this system from its competitors?

Cochrane: The biggest advantage is that Schwalm USA designed most of the components to work on both Talpa models. For instance, a camera that is used on the 2060 can also be changed over to the I330 in a matter of minutes. The same goes for the air motors and the digital box that basically controls the communication from the control unit in the vehicle to the robots.

MSW: What maintenance is required, and what about warranties and service?

Cochrane: There is basic maintenance that the operator performs on a daily or weekly basis. This can vary from the basic cleaning, oiling or greasing, and visual inspection to just the tightening of screws. We also strongly recommend to the owners that they have their robots fully inspected, and even serviced, once a year ... just like one would with their car. Since Schwalm USA is also a service center, owners do not have to ship their units overseas. ♦

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TRAINING AND EDUCATION JUST GOT EASIER

Online resources provide additional help and simplify the certification process

By Ted DeBoda

NASSCO continually works to improve the training experience of the Pipeline Assessment Certification Program and the Inspector Training Certification Program, including last year's launch of online PACP recertification, which is designed to provide a more convenient process for maintaining certification status.

In addition to the ongoing updates to course content and improvements to format, over the past couple of years significant work has been done behind the scenes to manage the massive amounts of data involved in the retention of and updates to student records and certification dates, scheduling of classes, and provision of course materials.

Earlier this year, NASSCO launched a new website designed to simplify the process of finding, registering for, and managing PACP and ITCP classes. Bringing together huge amounts of data, the new website allows visitors on www.nassco.org to take many actions:

- Search for a PACP or ITCP class by proximity to your location as well as by type of training.
- Search for a trainer by name, location, or class type.
- Register for a class and download resources.
- Purchase educational materials.

PACP and ITCP students can register for classes online and have the opportunity to receive class updates, request CEU credits, and download their ID cards and certificates.

In addition to finding, signing up for, and managing classes, visitors to www.nassco.org can easily search and download educational information

and resources including manufacturer specifications and publications, such as *NASSCO Times*, tech tips, white papers and more. Visitors can also search manufacturer guidelines by type of technology such as CIPP, pipe cleaning, pressure pipes, grouting, manhole rehabilitation and pipe bursting.

Another important resource on www.nassco.org is the ability to search for certified individuals by name; location; distance from location; and any combination of PACP, MACP, LACP or ITCP certification. This resource is especially valuable for system owners who want to find or validate the status of individuals certified in PACP and/or ITCP.

All of this data — and more — is now managed and accessible via www.nassco.org to better support NASSCO's training and educational resources. Additionally, the new website allows NASSCO members to post job openings, which are available for review by public visitors to the site. This helps bring the right professionals together with the NASSCO member companies that have employment needs to fill. Visitors can apply for scholarships, read about recent NASSCO news and industry trends, and learn more about our influential NASSCO committees and divisions (the International Pipe Bursting Association and Infiltration Control Grouting Association).

Making training resources easier to find and use, connecting industry professionals, and making educational resources more readily available all work together to support NASSCO's mission to set industry standards for the assessment and rehabilitation of underground infrastructure and to assure the continued acceptance and growth of trenchless technologies. Visit www.nassco.org to learn more. ♦



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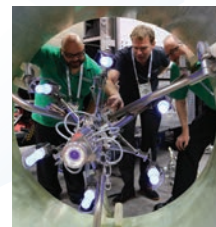
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LOCATION AND LEAK DETECTION

By Craig Mandli



CRAWLER CAMERA SYSTEMS

1. Forbest Products Co. FB215

The **FB215** crawler inspection camera from **Forbest Products Co.** is suitable for 6- to 16-inch pipe and comes with a waterproof crawler, featuring three types of wheels on the six-wheel-drive system and double motors that can turn left or right with the creeping speed of 20 to 65 feet per minute. The waterproof, pan-and-tilt, high-resolution color camera head's focus can be adjusted with the high-brightness LED lights. It carries 500 feet of 0.35-inch fiberglass cable and includes a meter counter and universal wheels with braking function. The heavy-duty, waterproof control box includes a 10-inch LCD color screen with USB and built-in SD card to record photos and videos. 877/369-1199; www.forbestusa.net.

2. RapidView IBAK North America ORPHEUS 2.0

The 6-inch **ORPHEUS 2.0** HD camera system from **RapidView IBAK North America** provides users with visual clarity in full 1920x1080 high definition. It has complete pan, tilt, and zoom capabilities and includes built-in laser measurement for measuring defects inside the pipe. With 120 times zoom and one-push, intelligent auto focus, it is ideal for providing crisp, clear images of larger-dimension pipes. 800/656-4225; www.rapidview.com.

DYE

3. BRIGHT DYES - Division of Kingscote Chemicals concentrated leak inspection dyes

Concentrated leak inspection dyes from **BRIGHT DYES - Division of Kingscote Chemicals** dissolve rapidly in water and provide a vivid fluorescent color that's detectable in murky water, sewage or effluent. They can be used to validate sanitary and septic hookups; identify leaks, infiltration and exfiltration in plumbing connections; and perform septic inspections to identify leachfield issues as well as sources of contamination in wells. They are safe, nontoxic, biodegradable, and certified by NSF International to NSF/ANSI Standard 60 for use in and around drinking water. They are

available in fluorescent yellow/green, red and orange, and nonfluorescent blue. They come in tablet, liquid or powder form. 800/394-0678; www.brightdyes.com.

ELECTRONIC LEAK DETECTION

4. Aquarius Spectrum AQS-SYS

AQS-SYS from **Aquarius Spectrum** is a system for continuous water pipe monitoring and leak detection using permanently installed vibration and hydrophone sensors. Highly sensitive sensors — equipped with a new generation of signal processing algorithms — monitor pipes of every type of material with high efficiency and wide coverage, typically using two sensors per kilometer of pipe. The sensors are equipped with 3G cellular communication modems and state-of-the-art synchronization modules that are capable of transferring large amounts of data and performing accurate correlations. Data analytics uses learning algorithms that perform adaptive signal filtering and multispectral correlations for leak detection. Entirely automated leak detection provides concise information on leak location and intensity. www.aquarius-spectrum.com.

5. Fluid Conservation Systems PermaNet+ Trunk Main

The **PermaNet+ Trunk Main** system from **Fluid Conservation Systems** is designed to offer continuous leak monitoring for sensitive trunk main pipelines. Leak noise data is collected using high-performance hydrophone sensors for long-distance monitoring on large-diameter mains. Data is transmitted to the base system via GPRS/3G telemetry and analyzed for potential leaks with dedicated alarm profiling software. The system continuously monitors noise and will auto alarm when threshold levels are reached. Secondary validation can be used to eliminate false positives and localize the leak's location. The system works in conjunction with Google Maps to provide live on-screen tracking, allowing leakage teams to respond quickly to problem areas. 800/531-5465; www.fluidconservation.com.



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6. Hermann Sewerin GmbH SePem 155

Systematic monitoring of a water pipe network with a **SePem 155** data logger from **Hermann Sewerin GmbH** lets users reliably identify existing leaks and catch new ones early on. It can report a leak after just one night. In a pipe network, water loss caused by a number of smaller leaks added together is likely to be considerably higher than the loss caused by a few spectacular pipe bursts visible on the surface. Noise loggers are capable of reliably detecting both types of leak sites: slowly growing and spontaneously occurring. It can be used for mobile or stationary monitoring of water supply networks. The SePem 01 Master, with its simple and intuitive menu navigation, provides fast and reliable results and can also be reliably operated by less-experienced users. Measuring times and periods of radio activity are freely programmable. 888/592-9916; www.sewerin.com.

7. SubSurface Leak Detection LD-18

The **LD-18** digital water leak detector from **SubSurface Leak Detection** offers automatic noise reduction from intermittent interfering noises, like passing vehicles, people talking and pedestrian footsteps. It can be used to find leaks quickly and easily, as it uses an amplifier to easily identify leak sounds. The all-digital amplifier has automatic noise reduction of environmental sounds, high and low filters, and storage and graphing of leak noises at different locations on the pipe. It uses a bar graph and numeric display of sound volume, and it has a USB connection and backlight. It includes five high-frequency filters, three low-frequency filters (plus low filter off), and two notch filters (plus notch filter off) to remove continuous interfering noises. 408/249-4673; www.subsurfaceleak.com.

ELECTRONIC LINE LOCATORS

8. Subsite Electronics UtiliGuard

The **UtiliGuard** utility locating system from **Subsite Electronics** uses ambient interference measurement to automatically scan the surrounding area for noise and recommend the best frequency among its 70 options. To help users make more accurate locates of obstructed utilities, it measures distances (depth) both horizontally and vertically to the utility. To ease use, the system has an intuitive, six-button, multilanguage operator interface and a high-contrast LCD display to ensure visibility in all conditions, including direct sunlight. A dual-output feature allows users to connect the transmitter

to two utilities at once, and the system is Bluetooth-enabled to simplify data transfers. Its rugged housing with an IP65 rating protects against dusty, dirty, and wet conditions, and it has 100-hour transmitter and 30-hour receiver battery life. 800/846-2713; www.subsite.com.

9. SubSurface Instruments AML Series All Material Locator

AML Series All Material Locators from **SubSurface Instruments** use modulated, powerful 2.45 GHz ground-penetrating, UHF radio waves to locate subsurface objects with ease. Using technology that was developed for lunar exploration, it locates materials indiscriminately, including PVC, PE, metal, wood, cable or pipe. It will work in clay, wet soil, snow and standing water. Man-made objects with a straight edge create a change in density or permeability from surrounding materials, which causes refracted radio waves to be detected by the AML. The highly sensitive dual left and right receivers activate a laser indicator that highlights the buried object's position on the ground. It includes GPS plotting and tracking, and it has 32 sensitivity settings. 855/422-6346; www.ssilocators.com.

PUSH TV CAMERA SYSTEMS

10. General Pipe Cleaners Gen-Eye POD

Lightweight **Gen-Eye POD** video inspection systems from **General Pipe Cleaners** offer optional Wi-Fi capability. A Wi-Fi transmitter inside the monitor lets the user send video to a tablet or smartphone to record the inspection. They can send the video to customers or post it to YouTube from the field. The package combines camera, reel and monitor. The full-size unit sports a self-leveling camera and 200 feet of Gel-Rod for troubleshooting 3- to 10-inch drainlines. The Mini-POD version carries a 125- or 175-foot pushrod with a mini self-leveling color camera that's small enough to troubleshoot 2- to 4-inch lines. A video-out connection lets the user record to an external device. A 7-inch LCD color monitor is mounted on a rugged, flexible gooseneck that swivels for optimal viewing angles. 800/245-6200; www.drainbrain.com.

11. Insight Vision Cameras Opticam 2017

The **Opticam 2017** camera system from **Insight Vision Cameras** has a user-friendly keypad that's been redesigned with an easy on-demand recording and snapshot button to help speed up inspection time. Technicians can

(continued)



easily record vital inspection data and client information using the available on-screen text writer and footage counter. A built-in microphone and speaker allows the technician to record voice-over videos and then play the video back on the 10.4-inch LCD monitor. The system includes a 1.3-inch modular, self-leveling camera head that is geared to inspect sewer pipes from 3 to 12 inches in diameter. A built-in sonde broadcasts a 512 Hz frequency, which is locatable with a 512 Hz locator. The system comes with a free downloadable Insight Vision app for iOS and Android mobile devices that allows users to view, record, snapshot and share sewer inspection videos. **800/488-8177; www.insightvisioncameras.com.**

12. Pearpoint/SPX P374 IS

The **P374 IS** from **Pearpoint/SPX** is a 200-foot intrinsically safe push-rod system certified to EEX ia IIC T6 for Zone 0 Hazardous environments such as vessels or pipework within the chemical and petrochemical industries, landfill venting systems and natural gas supply infrastructure. It enables users to work in areas where unrated or lower-rated systems may pose too high a risk. The surface equipment is IP55 rated, allowing the system to be used in difficult weather conditions. Compact and fully integrated, it is designed for easy transport and features a full QWERTY keyboard for titling alongside video connectors for recording and playback of surveys. **800/688-8094; www.pearpoint.com.**

13. Ratech Electronics Elite USB with Wi-Fi

The **Elite USB** with Wi-Fi from **Ratech Electronics** lets users record pipe inspections directly to a USB flash drive and wirelessly via an app to an iOS or Android device while taking live video and digital still photos, which can be immediately uploaded to YouTube. The Wi-Fi interface is available on any current or existing Ratech Electronics systems in the field. It's available with a sun-readable, 10-inch LCD monitor and a self-leveling camera, ultra-micro camera or pan-and-tilt push camera. Systems come in cable lengths from 100 to 400 feet. **800/461-9200; www.ratech-electronics.com.**

14. RIDGID CS65x

The **RIDGID CS65x** digital reporting monitor has Wi-Fi and Bluetooth as well as immediate access to footage from drainline inspections. It provides one-touch image recording for fast, efficient documentation of inspections, along with a new, faster processor and solid-state hard drive. It has ample storage for multiple jobs and docks to the SeeSnake Max rM200 camera system for on-site reporting. It has a built-in, water-resistant keyboard for easy addition of on-screen titles and annotation of captured media, as

well as a daylight-viewable display for a crisp, clear in-pipe image. It has a companion app compatible with Android and iOS devices. **800/769-7743; www.ridgid.com.**

15. Spartan Tool Explorer by Scanprobe

The **Explorer by Scanprobe** modular camera system from **Spartan Tool** has a control box that is compatible with five different pushrods 5 to 14 mm in diameter and 130 to 325 feet in length. Optional available camera heads from 16 to 50 mm provide the ability to tackle any size job. It comes with Win-Can software preinstalled, and USB, SD and cloud storage are available. An open reel design makes cleaning easy and allows for use in any environment. The specially designed screen even lets the user see video and images clearly in direct sunlight. Detachable stainless steel camera heads allow for quick changes and extra durability. Up to nine hours of battery life means the user can complete multiple jobs without recharging. External lighting and a radio sonde location system are optional. **800/435-3866; www.spartantool.com.**

16. Vivax-Metrotech Corp. Type-CP

The **Type-CP** inspection system from **Vivax-Metrotech Corp.** has a reel available in 200-, 300- or 400-foot lengths of stiff pushrod that's flexible enough for easy entry and turns. The 1.6-inch D34-CP self-leveling camera provides 700 pixels of resolution to inspect up to 6-inch pipes. It includes the vCam-5 control module with an 8-inch color LCD; transmitting sonde; full-function keyboard; internal microphone; AC/DC power; rechargeable batteries; distance counter; camera LED brightness control; and digital recording to the USB thumb drives, SD cards or internal hard drive. The control module ships ready to use with LACP software such as POSM, Win-Can or MuniXS. **800/446-3392; www.vivax-metrotech.com.**

SMOKE LOCATORS

17. Hurco Technologies Power Smoker 2

The **Power Smoker 2** from **Hurco Technologies** quickly locates leaks in new and existing plumbing systems. The machine is connected to a clean-out, and smoke is sent through the system to reveal any problem areas. The system uses LiquiSmoke, a laboratory-tested safe smoke that costs cents per minute to use and has an indefinite shelf life. When the test is complete, the smoke dissipates without leaving an odor or residue. **800/888-1436; www.hurcotech.com.**

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18. Superior Signal Company Smoke Generators

Smoke Generators from **Superior Signal Company** can help find the sources of surface inflow that are causing wet weather sanitary sewer overflows. They provide a fast, easy, and inexpensive way to find leaks and faults in collections systems; laterals; as well as building plumbing, drains and vents. Classic Smoke Candles provide visible smoke to detect more faults at a longer distance. Smoke Generators are available in sizes to meet any need, from 30 to 500,000 cubic feet. Smoke Fluid Systems use an insulated heating chamber with stainless steel injector to maximize dry smoke output and produce quality liquid-based smoke. They meet WEF, NASSCO and EPA standards. **800/945-8378; www.superiorsignal.com.**

19. TURBO FOG Division of Kingscote Chemicals MH-75

The **MH-75** from **TURBO FOG Division of Kingscote Chemicals** is a self-contained smoke tester for easily identifying leaks, infiltration and cross connections in municipal collection lines. The smoke-testing system uses leak-proof liquid aerosol smoke cartridges to create dense white smoke. No additional smoke bombs or garden sprayers are required. Made of 11-gauge powder-coated steel, the blower is capable of generating over 7,500 cfm to accurately test more pipe in less time. Briggs & Stratton and Honda engine models are available. **800/394-0678; www.turbo-fog.com.** ♦

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FEATURED CASE STUDY

PIPELINE AND INFRASTRUCTURE



Cape Breton uses Hydro-Guard HG-8 to improve water quality

In the Cape Breton Regional Municipality, Nova Scotia, an estimated 10 million gallons of treated, chlorinated water flows annually into the Sydney River. Since local lobster trapping grounds are nearby, this activity causes major concern for the Department of the Environment. When the municipality exposed the trench to install a sub-sur-

face, **Hydro-Guard HG-8** automated flushing device, a 35-year old **Mueller** inverted key curb stop used for routing flushed water through 3/4-inch polyethylene tubing to the river was connected to the outlet of the HG-8. Despite the age of the curb stop, it still proved to be a reliable connection. With the help of a new Mueller Oriseal curb stop on the inlet side of the HG-8 and an adjustable arch base service box, a second HG-8 was softly compacted to finish the simple installation. The programming of one-hour flush events was done by local Mueller Canada Technical Sales Representative, Jeff Jensen. This installation will recover costs in less than four months and conserve more than eight million gallons of water annually.

423/209-4855; www.muellercompany.com.

Scanning technology locates defects in siphon

Problem:

A large Southern California public agency recently undertook a major project to line several thousand feet of 30-inch force main beneath a heavily traveled highway. Adding to this already complicated project was a siphon with sharp bends. Due to the thickness of the liner, the bends led to wrinkles and stretching.

Solution:

With the liner still under warranty, the agency decided to further investigate the liner in the siphon by using **Electro Scan** to locate within 1 centimeter and to quantify in gallons per minute any potential leaks in the CIPP. The technology uses a narrow band of electricity to identify all openings in a nonconductive pipe wall that go to ground. Anywhere electricity leaks, water will leak too.

**RESULT:**

Electro Scan surveyed 159 feet of pipe during the night when part of the highway could be shutdown. It found six individual defects, contributing an estimated 8.17 gpm. The worst defect in the pipe represented 47.4 percent of the total estimated defect flow. The scan made it easy for the agency to identify and fix the defects. **800/975-6149; www.electroscan.com**.

Tracing sonde helps pinpoint manhole cover

Problem:

In order to launch a major sewer project, engineers for the city of Foreman, Arkansas, needed to locate two sewer manholes that were difficult to find. They had a general idea that they were near a commercial structure built years ago over the existing pipeline but didn't know where to start.

Solution:

Brent Hutchins from Brad Greer & Associates helped the city acquire an **XTpc+** from **Schonstedt Instrument Co.** and made a trip to Foreman to give the engineers pointers on using a sonde to trace the pipe's path. "We taped the sonde to a jetter and tracked it down the pipeline. I used the receiver to trace the sonde; then, we further pinpointed it with the yellow stick (a Schonstedt GA-52Cx)," he says.

**RESULT:**

"Digging down about 2 feet, we found the manhole cover. Everyone was happy. And thanks mostly to the training videos on Schonstedt's website, I looked like a hero," says Hutchins. The work was accomplished using a pipe and cable locator and a magnetic locator, available in the form of a multipurpose combo kit. **800/999-8280; www.schonstedt.com**. ♦



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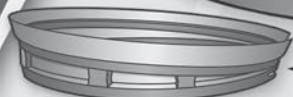
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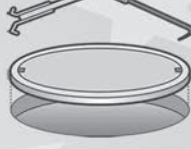
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Product Spotlight

A sustainable lining solution for stormwater pipe

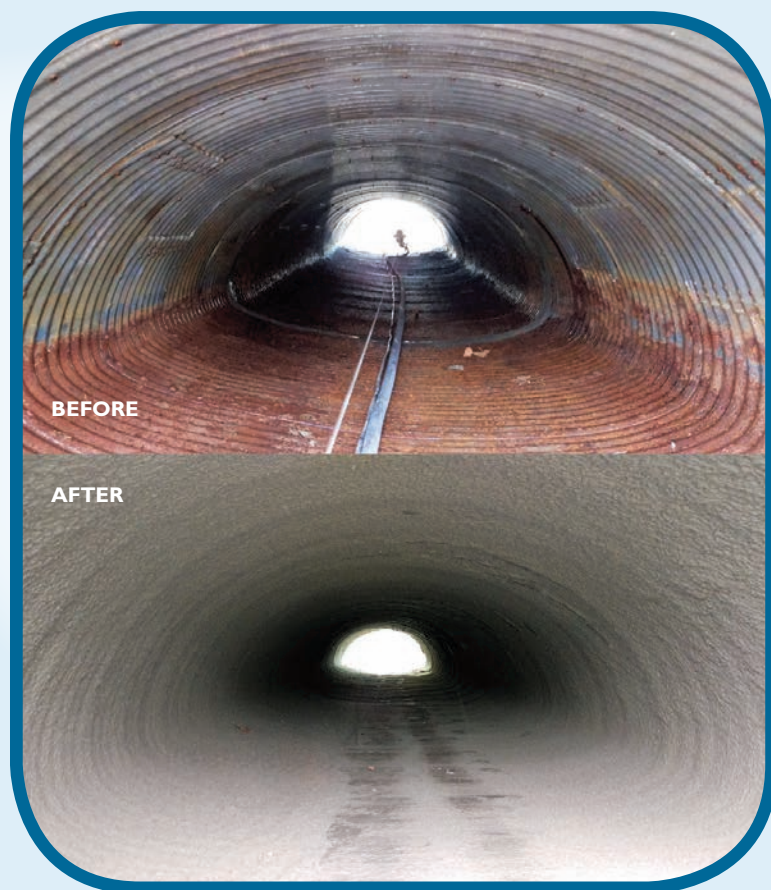
By Craig Mandli

Corrugated metal pipe has a limited life span. When the infrastructure nears the end of its design life — in most cases, after roughly 30 years under normal circumstances — structural fatigue, infiltration and corrosion can be prevalent. Full replacement can be time-consuming and expensive. Storm Seal is an ideal alternative.

The product from The Strong Company is a Type I Portland cement mix blended with pozzolans, aggregate and admixtures with alkaline-resistant fiberglass reinforcement. It is designed to restore deteriorated substrates to original dimensions and prevent infiltration and exfiltration of the interior of corrugated metal pipes, culverts, concrete pipes, catch basins, and other stormwater structures. It's a product that can be a time and money saver for contractors and municipalities, according to Emily Lanier, the company's sales and marketing coordinator.

"It is less intrusive than dig-and-replace methods and requires minimal equipment," she says. "While a deteriorated stormwater pipe may collapse, resulting in sinkholes, flooding and traffic disruptions, Storm Seal extends the life of a cement or corrugated metal pipe by creating a cementitious pipe within a pipe."

Storm Seal is centrifugally cast using the Strong-Seal Systems mixer, pump, and spinner, which are electronically controlled for consistent product and thickness of application. It may also be sprayed manually. It is fiber-reinforced and high-strength, testing at 8,000 psi compressive strength after 28 days. In addition, it incorporates up to 30 percent recycled materials, making it sustainable. It has undergone extensive research and development as well as independent laboratory testing, making it a



solution for stormwater infrastructure.

"Storm Seal was introduced to the market in the fall of 2013," says Lanier. "The goal was to ensure a high-quality product that our certified applicators and municipalities could be confident using."

Lanier says that feedback has been positive, as users of Storm Seal appreciate the product's ease of use and overall efficiency.

"Our applicators agree that being able to re-establish an invert and provide a monolithic cementitious seal inside these pipes has saved thousands (of dollars) and prevented costly construction," she says. "Being able to restore the structural integrity of the pipe without having to dig and replace means time and money saved." 800/982-8009; www.strongseal.com.

Advanced Drainage Systems Barracuda hydrodynamic separator

The Barracuda S4 from Advanced Drainage Systems is a hydrodynamic separator that removes sediment and other debris from stormwater runoff, protecting water resources. It is designed with teeth that mitigate turbulence in the storage chamber to prevent resuspension of captured contaminants. The Barracuda is designed for use in single manhole jobs and offers multiple pipe configurations, flexible inlet and outlet positioning, quick installation, easy inspection and maintenance. 800/821-6710; www.ads-pipe.com.



StoneAge BOP 622 back-out prevention device

StoneAge's BOP 622 back-out prevention device for pipe cleaning with the AutoBox ABX-500 hose tractor reduces overall weight for quick setup, secure anchoring and safe back-out prevention. It features a flexible 7-foot stainless steel snout that shields the hose and enables the tractor to exert up to 200 ft-lb of push force on the hose. The attached back-out preventer stops the tool



from exiting the pipe and can be used independently of the snout when needed. 866/795-1586; www.stoneagetools.com.

Reed Manufacturing Co. cordless power pipe beveler

Cordless power pipe bevelers from Reed Manufacturing Co. deburr and bevel plastic pipe 2 inches and larger in diameter. The lightweight tool creates fast, smooth bevels in the field with ease. Adjustable for bevel length, the RBIT1 router bit evenly cuts a 15-degree external bevel up to 5/8 inch long. The Cordless Power Beveler Kit consists of the beveler attachment powered by a 22,000 rpm, 18-volt cordless die grinder with a 4-amp-hour lithium-ion battery. The included RBIT1 cutting tool is a four-flute, carbide router bit. 800/666-3691; www.reedmfgco.com.



Water Cannon Inc. - MWBE skid-style pressure washer

The V-belt drive skid-style hot-water pressure washer from Water Cannon Inc. - MWBE is powered by a Kohler diesel engine and has customizable psi ratings from 3,200 to 4,000 and power from 4 to 8 gpm. It is self-contained with dual 15-gallon poly diesel fuel tanks, a 12-volt battery start, and a 45-amp charging system, so no external power is required. It has a stainless steel coil wrap, a burner hood, Beckett burners, a control panel, an adjustable thermostat and safety pressure release valve controls. Accessories included are a gun/wand assembly, 50-foot high-pressure hose, Maxi-Flo 20 percent chemical injector, four color-coded spray nozzles and a color-coded chemical nozzle. An optional wheel kit is offered for portability. 800/333-9274; www.watercannon.com.



COXREELS 1195 Series motorized hose reels

The 1195 Series electric motorized hose reels from COXREELS now offer gear-reducing idler sprockets. This add-on reduces the rewind speed, increases motor torque and fits an optional three-way pin lock. The all-steel idler sprockets are chain sprocket assemblies with a corrosion-protective coating that changes the drive ratio of the motor-to-drum drive system. They are available in three ratios (1:2, 1:3 and 1:4). The sprockets are mounted on a zinc-plated steel axle and rotate on two self-lubricated bronze bearings. 800/269-7335; www.coxreels.com. ♦



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Trinity Shoring Products acquired Efficiency Production

Trinity Shoring Products acquired the assets of Efficiency Production. Efficiency Production will continue to operate separately under its current brand name with no changes in personnel or point of contact for customers. The acquisition will also have no effect on the operations or personnel at Pro-Tec or GME.

Envirosight acquired MyTana Mfg.

Envirosight completed the acquisition of MyTana Mfg. July 31. MyTana Mfg. will continue to provide for its customers while leveraging Envirosight's expertise to expand its channels to market, diversify its marketing and evolve its technology platform for its inspection products. Jock Donaldson, MyTana Mfg.'s president, will retire at the end of the year. MyTana Mfg.'s general manager, Dale Graber, will stay with the company and join Envirosight's management team.

HD Supply Waterworks changes name

HD Supply Waterworks announced it is changing its name to Core & Main, effective immediately. The company, previously a division of HD Supply, currently employs about 2,900 associates at 246 branch locations throughout the U.S.

Advanced Drainage Systems announced management changes

Advanced Drainage Systems announced several leadership changes as part of its previously communicated succession plan. The board of directors has named Scott Barbour to serve as president and CEO, succeeding Joe Chlapaty, who has served in that capacity since 2004. Chlapaty will become chairman emeritus of the board. The board also named C. Robert Kidder as chairman of the board and Scott Barbour as a director.



Scott Barbour

McLaughlin hires Lee as regional sales manager

McLaughlin welcomes Cory Lee as regional sales manager. He will serve the company's clients in the Southwest. Lee, previously with Vermeer, brings more than 15 years' sales knowledge and five years of management experience to his new role.

Trelleborg strengthens pipe seals team in North America

Trelleborg appointed Matt Resler as key account manager for plastic pipe seals and announced the promotion of Tim Sparrow to sales director for the region. Resler will be based in Chicago and will be responsible for driving new business growth and fostering relationships with existing customers for the company's plastic pipe seals. Sparrow previously worked at Hilti and will be responsible for sales of all pipe seal products in North America.



Matt Resler



Tim Sparrow



Bahia Shrine Potentate Mitch Lokken, left, receives a check for \$18,000 from the owners of Pat's Pump & Blower.

Pat's Pump & Blower charity golf tournament

Pat's Pump & Blower held its inaugural charity golf tournament at the Mission Inn Resort & Spa in Florida to benefit the Bahia Shriners Transportation Fund. The fund enables the transport of patients and their families to the various Shriners Hospitals for Children, which provide burn and orthopedic treatment.

StoneAge welcomes new solutions manager

StoneAge announced the addition of Anne Brennan as its new western regional solutions manager. She will be based at the company's headquarters in Durango, Colorado, and she will provide sales and service to customers throughout the Western states.

Prime Resins adds to tech sales staff

Prime Resins announced the addition of Rick Broadrick and Steve Loudermilk to its technical sales team in the west and southeast regions, respectively. Broadrick brings more than 30 years' experience in the geotechnical and ground improvement industry, most recently with Nicholson Construction. Loudermilk brings more than 17 years' experience in technical manufacturing sales and was with Sprayroq for the last four years.



Rick Broadrick



Steve Loudermilk

Water-Right hires new regional sales manager

Water-Right announced the hiring of Brad Walsh as regional sales manager for the Southeast. He will be responsible for the growth and business management of Florida, Georgia, North Carolina, South Carolina, Tennessee, Virginia and West Virginia.



Brad Walsh

WILO USA names Joseph K. Jackson as director of sales

WILO USA has tapped Joseph Jackson as its new director of sales for the Water Management Division. He will oversee business development, sales channel direction and general management on water and wastewater projects in domestic municipal markets. ♦

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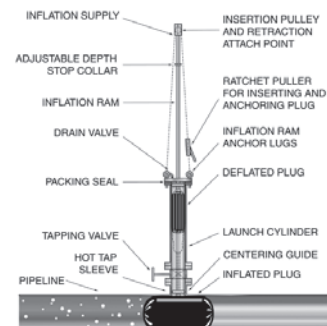


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WORTH NOTING

PEOPLE/AWARDS

The **city of Edmonton** (Alberta) announced the recipients of the 2017 Charles Labatiuk Awards for Environmental Excellence. The Eastgate Yard Rain Garden was honored in the City Operations category.

The **town of Swansboro** (North Carolina) received \$172,397 in U.S. EPA funds, which will go toward a project that will add dozens of public parking spaces near downtown and reduce the amount of untreated stormwater runoff reaching the nearby White Oak River.

Hayes Township (Michigan) received a \$10,000 grant from the directors of the Great Lakes Energy People Fund. The money will be used to construct rain gardens at Park Camp Sea-Gull on the north shore of Lake Charlevoix.

LEARNING OPPORTUNITIES

Wisconsin

The University of Wisconsin-Madison is offering a Using WinSLAMM: Meeting Urban Stormwater Management Goals seminar on Feb. 27-28 in Madison, Wisconsin. Visit www.epd.wisc.edu. ♦

CALENDAR

Oct. 30-Nov. 2

American Water Works Association Water Infrastructure Conference & Exposition, Westin Galleria Houston, Houston. Visit www.awwa.org.

Nov. 1-2

National Rural Water Association Cybersecurity Awareness Training Conference for Water/Wastewater Industry Professionals, Fairfield Inn & Suites, Raleigh, North Carolina. Visit www.nrwa.org.

Nov. 5-9

American Water Resources Association Annual Conference, Red Lion Hotel on the River-Jantzen Beach, Portland, Oregon. Visit www.awra.org.

Nov. 6-9

American Society of Civil Engineers' Operation & Maintenance of Stormwater Control Measures, Denver. Visit www.asce.org.

Nov. 12-16

American Water Works Association Water Quality Technology Conference, DoubleTree by Hilton Hotel Portland, Portland, Oregon. Visit www.awwa.org.

Dec. 6-8

Florida Stormwater Association Winter Conference, Hilton Orlando, Orlando. Visit www.florida-stormwater.org.

Feb. 20-23

Water Environment Federation Utility Management Conference, Hyatt Regency San Antonio Riverwalk Hotel, San Antonio. Visit www.wef.org.

March 6-9

National Utility Contractors Association Annual Convention, Wyndham San Antonio Riverwalk Hotel, San Antonio. Visit www.nuca.com.

April 22-25

American Water Resources Association Spring Specialty Conference: GIS and Water Resources X, Rosen Centre Hotel, Orlando. Visit www.awra.org.

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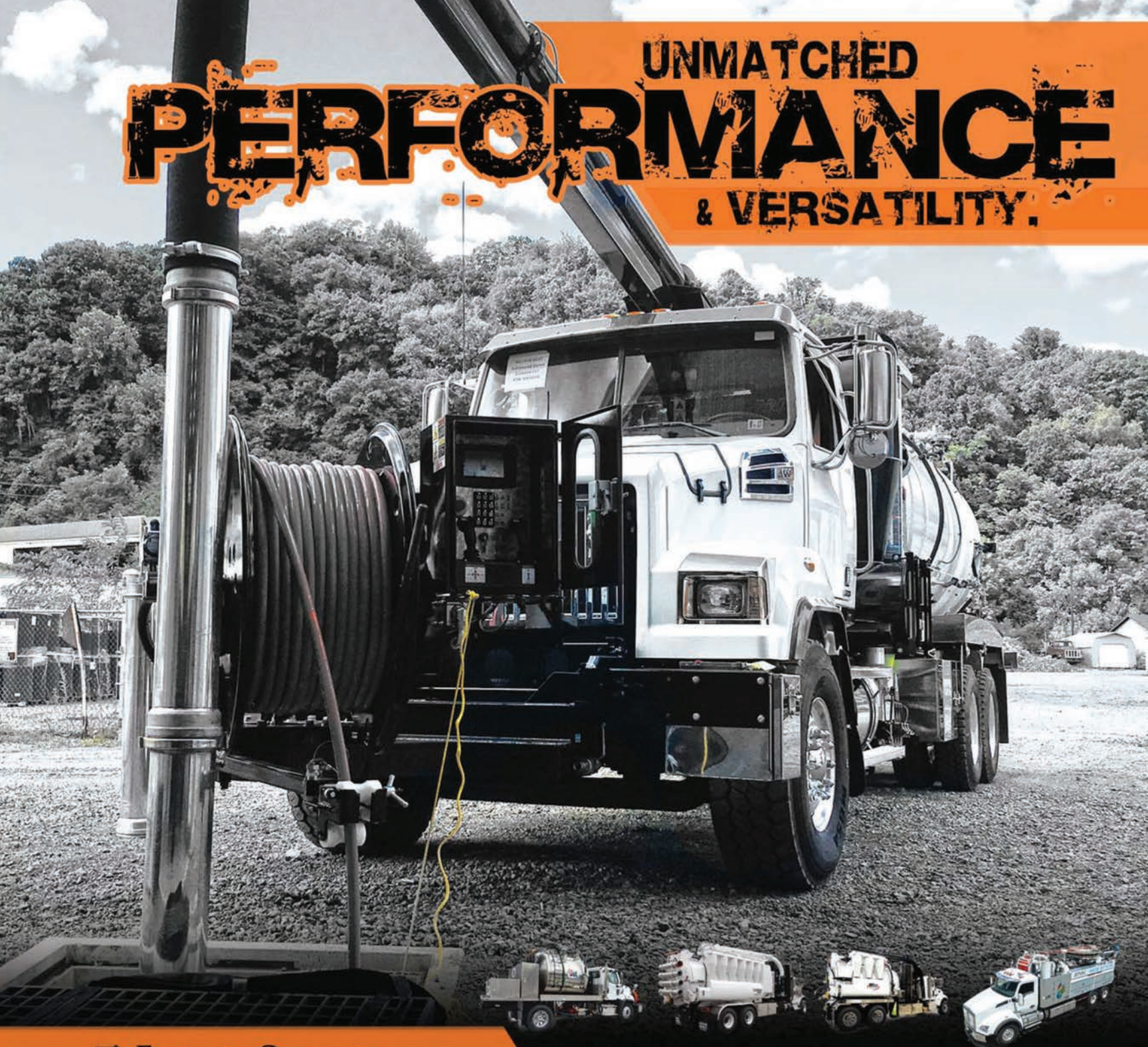
// The team members
are the greatest
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They know it.
They've been here forever.
They do the work.
I'm support staff.
I coordinate what they do,
and the best way for me
to do that is to listen to
what they have to say."

Nate Tillis
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