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FOR SANITARY, STORM AND
March 2019

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Bonita Springs Utilities team
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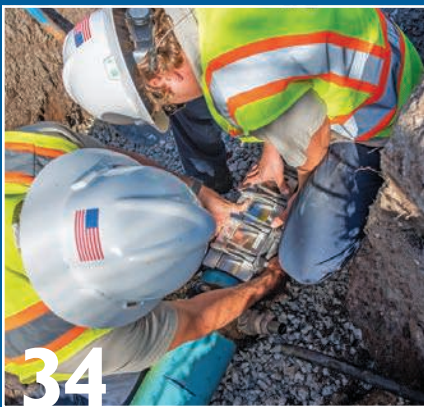
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ON THE COVER: Members of Bonita Springs' award-winning water distribution team install a new residential water service in Bonita Springs, Florida. (Photography by Ryan G Photo)



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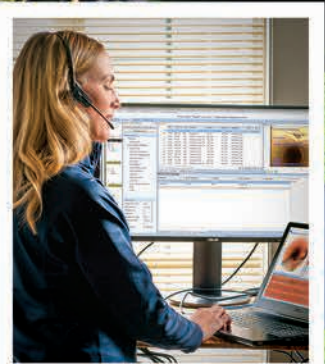
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THE RAW TRUTH

I'm not buying expensive water trends, but maybe it's time to start selling them



FROM THE EDITOR

Luke Laggis

I've lived quite a few places, but I've never had better water right from the tap than where I live now. I also live sort of in the middle of nowhere with a well in my yard that feeds water directly into my house. Raw. No filtration or treatment needed.

I'm lucky. I'm told I have the best water in the neighborhood. My seasonal neighbors next door get their water from the hose bib on my garage in summer because their water isn't nearly as good.

The water from the municipal system in my hometown has always been good too. Growing up it was just water. It's what I knew. But then you get older and travel and move away, and you start to notice those things that you always took for granted. In all but the worst of instances, Americans don't have to worry about safe drinking water. And that fact for the most part is because of the work you do.

As a collective whole in this country, it's sometimes amazing how disconnected we are from the products we so readily consume. There's a lack

of understanding of where and how products are made, where our food comes from, and how safe, clean water miraculously flows from the tap whenever we turn it on.

One of the more interesting results of that, especially as it pertains to the work you do, is the small, lucrative and mind-blowingly ridiculous raw — or live — water fad. It's not dead, and it's not cooked, smoked or cured; it's raw.

People have a variety of concerns with tap water, from the health effects of fluoride and other chemicals used in the treatment process to lead leaching and other potential contaminants, and view raw water as a healthier, albeit more expensive, alternative. The latter is certainly true anyway. Along with the lack of chemicals, live bacteria — somewhat euphemistically referred to as probiotics — and a higher concentration of minerals are among the touted benefits.

For these perceived benefits, you'll pay handsomely. A 1-quart mason jar of Raw Sedona Artesian Spring water is listed on eBay for \$5.95. That's \$23.80 per gallon, plus shipping. Raw water from Maine's Summit Spring, one of the oldest natural spring sources in North America, according to its website, is currently unavailable on Amazon. Fortunately its standard spring water, taken from the same source as the raw but lightly processed and ozonated, is available. A 12-pack of 33-ounce bottles will only cost you \$38.74, or a very modest \$12.54 per gallon. And shipping is free if you're a Prime member!

If you're instead looking to avoid minerals but want to ensure you have the most expensive water on your block, you'll want to turn your thirst toward Canada, the source of Berg iceberg water. A 24-pack of 16.9-ounce bottles of Berg, which is free from any trace of minerals, sells for \$135.34. That's right, \$135.34, or \$42.69 per gallon.

Raw water isn't new, and icebergs aren't really cutting-edge technology either. But bottling water from these sources and selling it for exorbitant prices is a more recent and peculiar phenomenon. It also shows a real lack of appreciation for the service you provide.

It's insane and it underscores how important it is for you and your utilities to incorporate a strong element of public outreach and education in your operations. Help people understand where their water comes from, what's in it and what isn't, and above all, its value. And if that doesn't work, maybe just start bottling your water and selling it for exponentially more than you charge to send it straight to customers' taps. Send it out the door in a needlessly elegant glass bottle and you can charge even more — plastic, after all, isn't the proper vessel for such sanctimonious consumers.

As for me, I'm in the process of making artisanal papyrus labels for my own brand of raw water, drawn from an ancient aquifer in my backyard and ladled lovingly into hand-blown glass bottles.

Enjoy this month's issue. And thanks for delivering quality product at a palatable price. ♦

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

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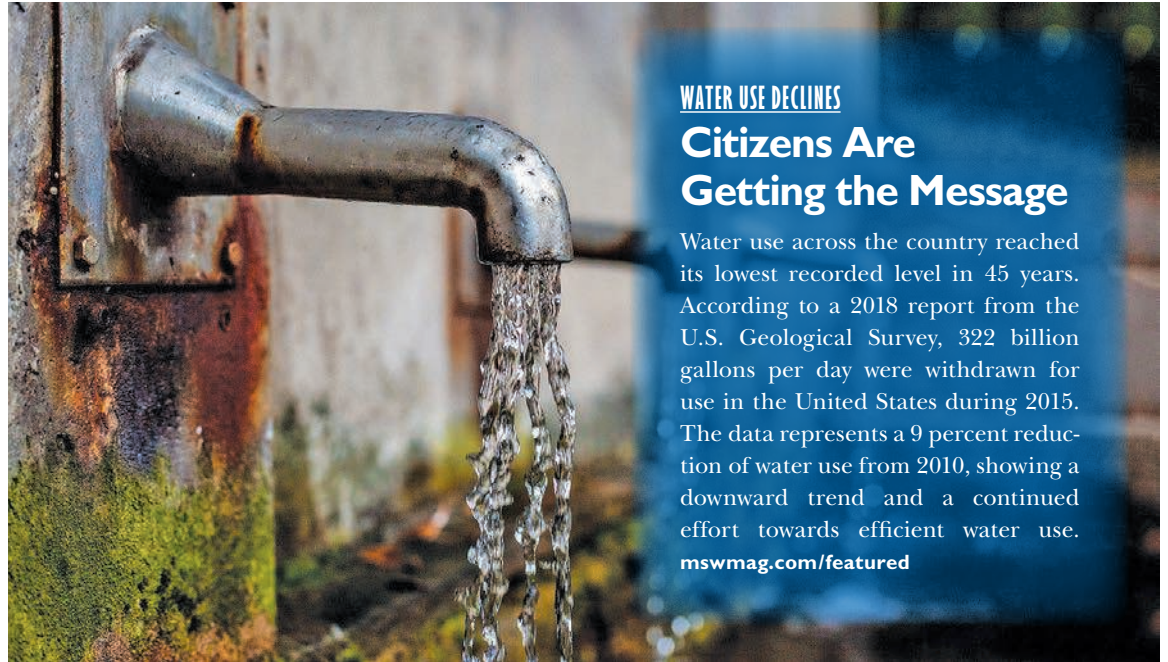
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OVERHEARD ONLINE

“People are still getting all the water they need. They’re just using it more efficiently, and thinking a little bit more about that water.”

— *Annual Water Use in Madison, Wisconsin, Drops by a Billion Gallons in Six Years*
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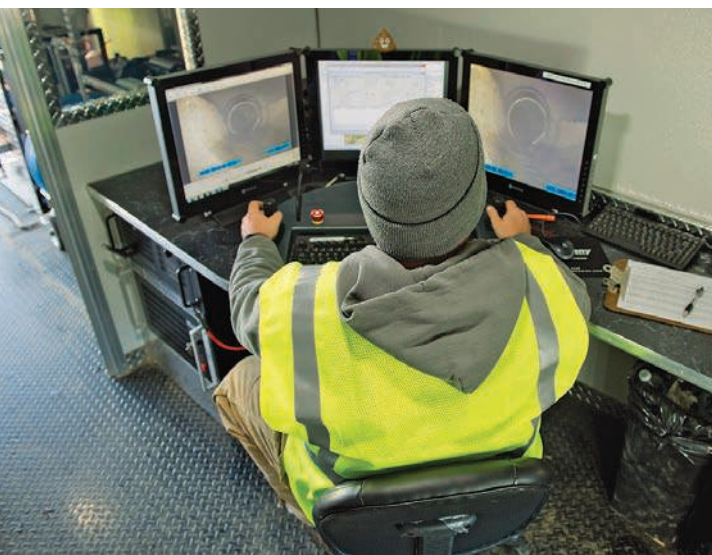


WATER USE DECLINES

Citizens Are Getting the Message

Water use across the country reached its lowest recorded level in 45 years. According to a 2018 report from the U.S. Geological Survey, 322 billion gallons per day were withdrawn for use in the United States during 2015. The data represents a 9 percent reduction of water use from 2010, showing a downward trend and a continued effort towards efficient water use.

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LEARNING TO CRAWL

Training CCTV Operators

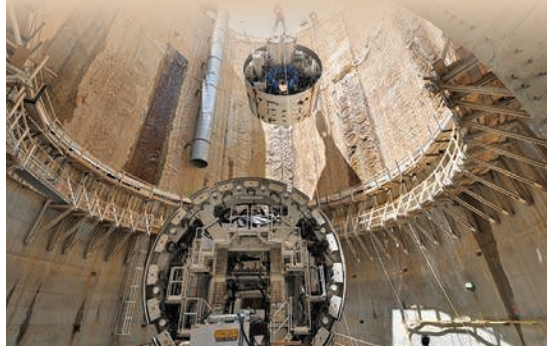
A couple hallmarks of good CCTV inspection operators are resourcefulness and an abundance of common sense when it comes to solving safety issues and problems with equipment. But how do you find — or rather, develop — workers with this skillset? What does it take to become a CCTV operator? In this online exclusive article, we talk to industry experts who help answer those questions. mswmag.com/featured

DC WATER TUNNEL

Saving the Anacostia River

Last year, DC Water opened the first 7-mile segment of its Anacostia River Tunnel system — a massive storage structure for combined sewer overflow that officials now say saved the Anacostia River from 4.5 billion gallons of sewage overflow and 900 tons of trash in 2018. Read about how the largest infrastructure project in DC Water’s history seeks to reverse decades of damage done by combined sewer overflows during heavy rains.

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STAYING AHEAD OF GROWTH

Mooresville (North Carolina) Public Utilities line maintenance mechanic Luis Canvelario uses a Vacall jet/vac truck to clean a sewer main. (Photography by Ken Osburn)



Ricky Green (left) and Shannon Hager of the Mooresville Public Utilities department install a new water service.

Award-winning utility takes an efficient approach to system upgrades and operation

By Giles Lambertson

Mooresville (North Carolina) Public Utilities earned the state's Distribution System of the Year award three years in a row from 2014-16. The run ended in 2017.

"I don't know what happened," says a laughing Allison Kraft, director of Public Utilities for the western North Carolina community. "But ... we also won the American Water Works Association Collection System of the Year award in 2013, 2016 and 2017."

And to no one's surprise, they reclaimed their place as Distribution System of the Year in 2018.

Obviously, Mooresville utilities are in good hands even when the system occasionally is *not* feted for excellence. Some of the credit must go to Kraft. She has been in Mooresville for a dozen years and, prior to becoming utilities director last year, headed the town's engineering department.

Growth rates

Mooresville's population doubled between 1990 and 2000, from 9,300 residents to 18,800. In the 18 years since, it has doubled again, with approximately 40,000 people now calling the city home.

"It definitely is a struggle to stay ahead of the growth," Kraft says. "We are doing fine right now,

but we have a lot of capital projects coming on to increase the backbone of the system." The city's five-year capital improvement program has a \$40 million price tag, with much of it pegged to growth-related large-scale maintenance projects.

Kraft says rates have been "relatively high" for years after a visionary board saw growth coming and prepared for it. "They made the decision at that time to set the rates relatively high and pay for construction and maintenance costs as we went. They looked far ahead and, consequently, we were able to meet the capital costs to maintain our growth." Mooresville's rates are now nearer the regional norm after other cities in the Piedmont region raised rates to play catch-up with infrastructure.

The other impact of all the capital projects is that the city has difficulty finding contractors. It is a problem Mooresville shares with other communities in the greater Charlotte area. "Sometimes we have projects we really want to do, but the construction climate is very competitive in favor of contractors," the utilities director says. "We've had to make some decisions, prioritizing projects that are in the best interests of ratepayers so we can get them done."



Line maintenance mechanic John Jones exercises a hydrant valve.

“It definitely is a struggle to stay ahead of the growth. We are doing fine right now, but we have a lot of capital projects coming on to increase the backbone of the system.”

Allison Kraft

Ample supply

The Mooresville wastewater system serves 16,000 accounts and includes more than 600 miles of waterlines and sewer lines, 50 lift stations and 6,500 manholes. That infrastructure needs constant attention and in the last year, Kraft says more than 1.5 miles of gravity lines were rehabbed or replaced, 25 miles of sewer line inspected, 10 manholes repaired, 84 miles of sewer and 18 lift stations cleaned, and 132 troubleshooting or emergency responses made.

Thirty-two people in the water and sewer maintenance department do all this work, save for larger projects that are outsourced. Some of the crews are dedicated to specific tasks such as pump maintenance, meter reading, utility locating and electrical maintenance. “The rest of our crews are really interchangeable and cross-trained,” Kraft says. Though generally assigned to either water or sewer utilities, they can switch from one to another as tasks demand, including being on call for emergencies on weekends.

It helps that most of the community’s water and sewer infrastructure is relatively young. Mooresville’s wastewater treatment plant on the Rocky River was built in



PROFILE:
Mooresville
(North Carolina)
Public Utilities

CUSTOMERS:
16,000 commercial and residential accounts

SERVICE AREA:
21 square miles

WASTEWATER PLANT CAPACITY:
7.5 mgd

FRESHWATER PLANT CAPACITY:
18 mgd (6-7 mgd distributed)

INFRASTRUCTURE:
600 miles of waterlines and sewer lines

EMPLOYEES:
65

WEBSITE:
www.ci.mooresville.nc.us

the 1980s and was expanded and upgraded in 2011.

The city's two water plants are capable of pumping significantly more volume than current demand requires. The newest plant, with a capacity of 12 mgd, was commissioned in 2010. "The plant was built so we can double its size by adding parallel filters. It was built when growth was on the horizon," Kraft says. The older unit, which dates from the 1960s, underwent a major renovation in the 1990s and has a capacity of 6 mgd.

Water is plentiful: Mooresville's supply is drawn from Lake Norman — built by Duke Energy and considered the largest man-made freshwater body in North Carolina. The oldest section of Mooresville — its downtown area — contains the most suspect pipes, but they are being methodically replaced. In several areas of the city, 2-inch galvanized waterlines are being supplanted by PVC lines.

Current focus

Monitoring the condition of gravity sewer system is the preoccupation of two employees, who systematically inspect the lines. He probes the pipes using an Envirosight ROVER X camera, with images uploaded using WinCan software.

The inspections help guide the work routine of the pipeline maintenance crew, while other crews concentrate on other tasks. The pump station crew systematically keeps water moving. Water crews install new water meters seemingly just ahead of moving vans plying the fast-growing Charlotte suburb. The pipe-cleaning crew spends a significant amount of time trying to stay ahead of the verdant region's many tree roots, which constantly infiltrate sewer systems.

Maintenance crews do one waterline replacement job a year, usually less than 500 feet in length. "It's a way to maintain some skills," Kraft says. The rest of the new or replacement construction work is bid out. Currently some \$12 million of large-diameter PVC sewer outfall pipeline projects are being worked by contractors and two other projects are in the design stage. The new infrastructure will increase capacity, replace some aging lines and extend services to unserved areas.

"So far, we have only replaced pipe in the traditional manner," Kraft says. A current focus is replacement of 2-inch pipe with 8-inch pipe. "We haven't had the opportunity to try bursting pipe. We haven't had a project that was a good

candidate for that process."

Most excavation is handled with traditional equipment. Though maintenance crews do have access to two Vacall vacuum trucks — one just 3 years old — neither is configured for hydroexcavation. "Though we sometimes do use the trucks like a hydroexcavator," she says, applying high-pressure water with a wand and sucking up the solution. Any other equipment Kraft needs for a maintenance project she can acquire by walking down the hall of the operations center to the streets department office. "We always can borrow from them."

Efficient management

The operations center, which opened in 2011, is key to the city's effective utility management. The building houses utilities maintenance, sanitation and street department staff, and the engineering department; and Kraft believes the grouping of departments is a big plus.

"No one anticipated the benefit from a workflow standpoint that coming together in that building was going to give us," she says. "You can walk right down the hall and coordinate waterline work with sidewalk work. I can coordinate with the street program so we can get ahead of them on

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Shawn Thompson (left) and senior pump maintenance mechanic Scott Brumley position a replacement pump for installation.

“No one anticipated the benefit from a workflow standpoint that coming together in that building was going to give us.”

Allison Kraft

ings and input them into the system. Without too much help from outside consultants, we created a GIS system and we use it extensively now.”

She says the system required a half-dozen years to actually become useful and still is a work in progress. “But now we have it to where we can put a work order in the system, or track where we have had sewer backups, or work with the wastewater plant to track down the source of something found in the system.”

In short, the GIS combined with improved interdepartmental coordination spawned new ways for Mooresville to stay ahead of utilities issues. The city’s proactive maintenance, lessened water loss, improved handling of pipeline issues, and similar management successes are the result — all of which impresses judges when awards are being handed out.

“I don’t feel pressure to win awards, but we continually are looking for ways to our work better, looking at new equipment, at new ways of doing things,” Kraft says. “I’m really proud that we are not afraid to try something, but also are willing to say, ‘No, this didn’t work for us. Let’s try something else.’ If it’s not the right thing, we move on.” ♦

utility projects. From a workflow perspective and public perception standpoint, no one wants to see a utilities cut in a brand-new road.”

The other impetus behind the utilities department functioning with such award-winning efficiency is the adoption of GIS mapping. It came about

when the economy tanked in 2008-09, Kraft says, leaving staff in the engineering department with little to do. “People wanted to find something meaningful for them to do, so they were taught, for example, how to pick up locations of meters using hand-held GPS units and to scan old draw-

EVOLUTION OF A CITY’S ECONOMY

Mooresville began as a farming community in the 1700s. It prospered at the turn of the 20th century on the strength of large cotton plantations that fed product to cotton mills. The city’s large Mill No. 1 became a self-contained village within a community, with housing, churches, schools and stores provided for employees by the mill owners.

Allison Kraft, Mooresville utilities director, is well aware of this history. Her office is saddled with updating the sewer and water infrastructure in the downtown’s Historic Mill Village. “The lines were laid by the owner of the mill and eventually turned over to the city,” she says. “We are in the midst of a project to replace all of them.”

While the largesse of the mill owner was appreciated at the time, private development of the water and sewer systems now poses difficulties for the city. There are no schematics for the systems, for instance. “We don’t have any map of many of the pipelines. That’s the struggle for us,” Kraft acknowledges.

Tracking down and replacing the old clay pipelines is a challenge. The old pipe is one reason the city has budgeted a million dollars annually for inflow and infiltration work.

North Carolina lost most of its textile mills after the passage of the North American Free Trade Agreement in the 1990s, with much of the industry moving south of the border. Today, Mooresville has no mill. What it does have is a concentration of NASCAR racing teams and support organizations. This is a reflection of the region’s fascination with racing stock cars, including at nearby Charlotte Motor Speedway. Mooresville’s chamber of commerce nickname is Race City USA.

The racing business is a clean industry in terms of waste products that make their way into Mooresville’s wastewater system. “From a waste product standpoint, the NASCAR industry really doesn’t add a lot to the system,” Kraft says. In addition, the town’s industrial park has some advanced manufacturing facilities and food industry plants, neither of which is a large-scale wastewater contributor. Another significant — and clean — employer is Lowe’s Home Improvement. Mooresville serves as national headquarters for Lowe’s Cos.



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STOPPING THE RESIDENT SLACKER

Unless it's done correctly, dealing with the weakest link on your team is fraught with career peril

By Ken Wysocky



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.

Anyone who's in the workplace long enough eventually runs into a slacker. You know the type — that one colleague who's the anchor weighing down your team's boat, the governor on your team's engine, the gale-force headwind in your team's face, the ... well, you get the picture.

Recognizing the resident laggard is easy. But handling the situation constructively can pose a bit of a challenge.

“These problems rarely occur because someone is a bad person. Sometimes all it takes is some education or training or moving them to a job that's better suited to their skills.”

Allan Cohen

situation? First try talking to the colleague, but tread lightly, advises Allan Cohen, a distinguished professor in global leadership at Babson College in San Francisco. He also wrote a book with co-author David Bradford called, *Influence Without Authority*.

“The first thing to do is ask the person if something is wrong,” Cohen says. “But proceed with caution. ... There are always polit-

How so? Well, if done incorrectly, bringing a matter like this to your manager's attention might earn you a reputation as a get-ahead-at-all-costs tattler and career-wrecker. But ignoring the situation also carries risks, such as logging burnout-inducing hours to cover for the slacker's deficiencies.

So how should you go about handling such a sensitive and untenable

ical risks involved when talking to someone or about someone else.”

If the slacker behavior is a fairly recent development, there may be something specific that triggered it, such as marital trouble, personal-health issues, a job-role change or a new supervisor, for example. Or perhaps the colleague lacks the skills to do his or her job effectively and needs training, or is resentful about not getting a promotion, he suggests.

Don't make it personal

Obviously, having this conversation is a lot easier if you already have established a decent working relationship. But either way,

it's important to frame the conversation not as a personal attack, but as concern for the person's well-being, using open-ended questions. In short, asking why the person is a nonstarter.

“It has to be a friendly inquiry,” Cohen notes. “It's always easier to get a conversation going with a general inquiry as opposed to going into accusatory mode. Perhaps you could say something along the lines of, ‘It seems like you're having trouble delivering on assignments — what's up?’ Or, ‘Things don't seem to be going well for you — is something wrong?’”

Of course, if you don't have a good relationship with the person, it's a more difficult conversation. If that's the case, consider asking for help from a colleague who knows the person reasonably well, Cohen suggests.

Many experts recommend holding several of these conversations, especially if things don't improve right away. Keep in mind that it takes time to turn around an aircraft carrier, metaphorically speaking. But at some point, you need to specifically point out how the slacker's behavior is adversely affecting colleagues' ability to work.

“You can tell them that you're not out to get them in trouble, just interested in a solution to the problem,” Cohen says. “Always leave open the possibility that there's a positive solution ... that it can be converted into a collaboration, not just a slash-and-burn

(continued)

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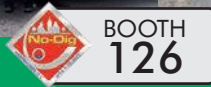
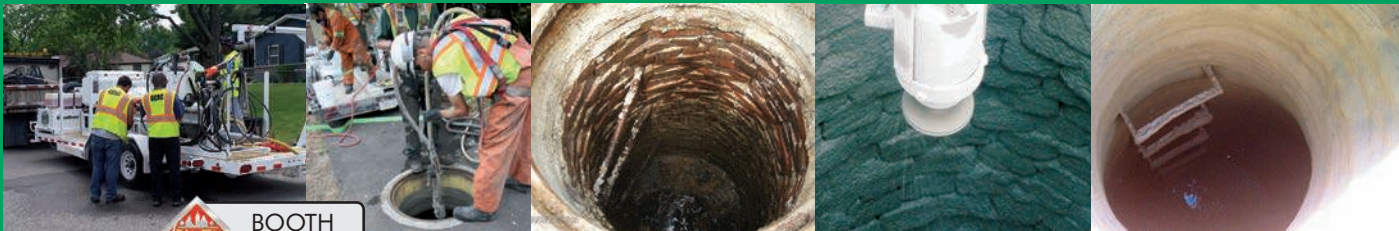
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Randall Dellaposta, Director of Equipment and Facilities at the Genesee County Road Commission (GCRC)



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approach. These problems rarely occur because someone is a bad person. Sometimes all it takes is some education or training or moving them to a job that's better suited to their skills.”

Just the facts

If the situation doesn't improve, things inevitably reach a tipping point where the only recourse is to escalate things and bring it to a manager's attention. If possible, it's helpful if the colleague is willing to join you in the meeting with your manager. If not, then it's fine to proceed alone, Cohen says.

But again, using a well-reasoned, low-key approach is critical to avoiding the aforementioned political and career repercussions. “If you decide to take the matter upstairs, make it in the spirit of an inquiry,” Cohen recommends. “Tell the manager you need help with addressing a problem, instead of just saying that ‘X’ is a lousy person who's always messing things up. Put it on the table not as if you're a workplace spy, but as someone who needs help resolving an issue so everyone can get their work done.”

Providing your manager with specific, factual examples of how work has been adversely affected (project deadlines missed, quotas not filled, etc.) will help bolster your position. It also will reinforce to your manager that you're bringing up the matter for sound, objective business reasons, not political gain, he says.

“There's a very fine balance involved in building a case,” Cohen explains. “If not done correctly, you often can sound very one-sided and make it look like you're trying to harm somebody, which doesn't make you look good. I think it's better to go in and express concern for the situation and ask for advice about how to solve it in a constructive way.”

Furthermore, be sure to tell your manager what you've already tried to do, he adds.

Call to action

Whatever you do, however, don't ignore the situation and hope it will eventually get better. Inaction hurts both the slacker and you and your team. How? Think about it this way: As a general rule, many people don't feel comfortable talking about how personal issues are affecting them at work — or asking for help, for that matter.

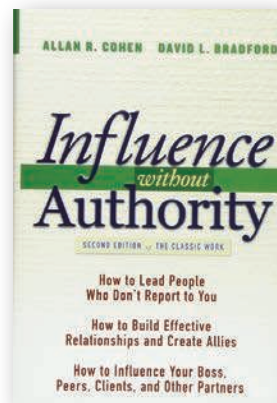
“So if someone is experiencing problems and no one asks what's wrong, the person feels like nobody gives a damn and the situation only gets worse,” Cohen says.

On the other end of the spectrum, when hardworking colleagues see someone slacking off without any consequences, they feel resentful. As a result, reduced morale and productivity may ensue, along with increased turnover. “It's too demoralizing — a rotten-apple-in-the-barrel situation,” he says.

In the end, however, employees should never forget that they have the ability to influence others, even if they're not managers. The key is the power of reciprocity, which Cohen says is the basis of all influence.

In short, if you give someone what they want, which Cohen calls a “currency,” they're more likely to give you what you want. “You can influence colleagues or bosses by finding a currency they want and figuring out a way to give it to them,” Cohen says.

In the case of slackers, perhaps all they want is better information, better training or a better job that's more suited to their skill sets. And if they get it, your reciprocal reward might well be a harder-working colleague who helps your team shine. No more difficult conversations required. ♦





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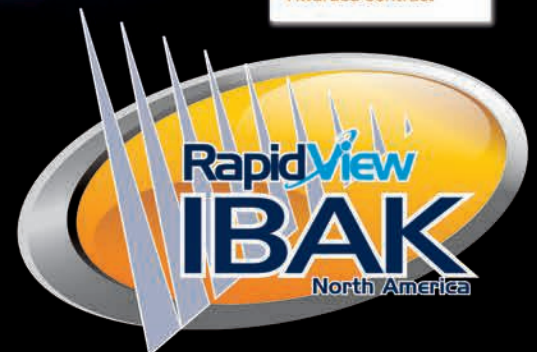
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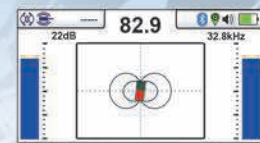
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BUILDING AN OASIS

Arizona community pools resources, improves efficiency and works toward a more secure future

By Jim Force

Paul Jager of the Marana Water Department flushes a fire hydrant at the Tangerine Business Park in Marana, Arizona. (Photography by Mark Henle)

Few communities in America are more conscious of their water supply than Marana, Arizona.

Located a few miles northwest of Tucson along Interstate 10, Marana relies on Colorado River water through the Central Arizona Project (CAP), groundwater and reclaimed wastewater to deliver a reliable supply of high-quality water to its 8,000 customers.

The utility aggressively promotes conservation and recently received an award for participation in a forward-looking multicomunity project that will help reduce groundwater overdrafting across the region.

At the same time, it plans to build brand-new water treatment facilities to remove unregulated compounds from groundwater wells in two of its water systems.

“Water is critical here,” says John Kmiec, water director. “Our growth depends on it.”

New community

The town was incorporated in 1977, and water was the reason. “The city of Tucson was acquiring farmland in the area in order to secure water rights associated with the properties,” Kmiec explains. “The town was essentially established to prevent further encroachment. It’s all about water here.”

Originally, the town bought small rural water companies and operated as a rural water system for several years.

The Marana Water Department was established in 1997, and in 2017, it was recognized as the small water system of the year by the Arizona Water Association.

The town’s original population was around 1,500 in 1977, but now is closing in on close to 50,000 by 2020. The Marana Water Department serves about 50 percent of the current population with Tucson Water serving the rest. Most of all, future growth in Marana will continue within the Marana Water Department service area.

Infrastructure

Kmiec’s department supplies water to its customers through a series of groundwater wells, aboveground storage tanks and seven independent water distribution systems. About 2,400 acre-feet of water per year are imported from the Colorado River through the CAP canal, which runs 336 miles from Lake Havasu in northwest Arizona to the Tucson area in the south.

A new water reclamation facility recycles about half a million gallons of treated wastewater to a community nature park located next to the plant where it also recharges the aquifer.

At the wellheads, water is treated with calcium hypochlorite for disinfection before it is pumped to end users.

“Marana updates its potable water plan every 10 years,” Kmiec explains. “Essentially we are transitioning from a collection of small rural water systems to a full service water and wastewater utility.”

(continued)

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“Water is critical here. Our growth depends on it.”

John Kmiec

The current infrastructure plan includes rehabilitating some of the older waterlines in the community, maintaining the water storage tanks and replacing the utility’s SCADA system.

“The recession affected our growth,” Kmiec says, “but now we are growing again.” While the majority of the distribution piping is less than 20 years old, the department is replacing some of the mains in its older neighborhoods with new PVC pipe as roads and streets are rebuilt. Most of the old piping is concrete asbestos or galvanized steel. In 2017, about 2,000 feet of older mains in a neighborhood built in the early 1950s were replaced.

Interconnectivity among Marana’s seven different water systems is the long-term strategic goal. This will be done by a series of capital projects that will start to lay the distribution piping necessary to move water back and forth from systems

that are currently operated independently.

“As our community starts to fill in — conversion of farmlands into housing — we need to bring these smaller systems together into larger systems,” Kmiec says. “This will give us the necessary redundancy and reliability we need as we grow. Right now, if a well goes down, depending on the system, we may have a hard time meeting demand.”

He says the connections will balance ground-water withdrawals and energy usage and be more efficient.

Marana is also re-coating its water storage tanks as part of a 10-year preventive maintenance program. “We are doing one to two per year,” Kmiec says. “We frequently assess the condition of our reservoir assets and take a proactive approach to maintaining them.”

The tanks are constructed of steel and, depending on conditions, are being re-coated on the interior and exterior.

Another upgrade involves the SCADA system. “When we consisted of a number of smaller rural water systems, we were also using older technology,”

Kmiec says. “The new SCADA system is being upgraded to a new Rockwell platform. This will take several years to convert all the assets. Once fully completed, our operators will have the ability to review and control operations without the need to be on site or in a central control center.”

Water strategy

In the old days, Arizona communities treated their wastewater and dumped the effluent in the desert. No longer. Faced with chronic drought and diminishing surface water supplies, utilities like Marana Water are doing everything possible to use water wisely and prepare for the future.

“It’s definitely a huge challenge,” Kmiec says. “We have to transition to renewable water sources as soon as possible.”

In the case of Marana, that means smart management of its allotment of Colorado River water through the CAP.

“We can either use it the same year it is delivered or bank it for long-term storage credits,” Kmiec explains.

(continued)

PROFILE:

Marana, Arizona, Water Department

FOUNDED:

Community incorporated 1977,
water utility formed 1997

CUSTOMERS SERVED:

8,000 connections (population 24,000),
total town population 48,000

AREA SERVED:

Approximately 10 square miles
in the northern and western portions
of Marana, future service area is
approximately 80 square miles

SOURCE WATER:

Central Arizona Project
(Colorado River water), groundwater,
recycled wastewater

WATER SYSTEM:

7 systems, 18 tanks, 150 miles
of distribution lines, 23 booster stations

WATER RECLAMATION PLANT:

1.5 mgd Bardenpho process

STAFF:

John Kmiec, water director;
Scott Schladweiler, deputy water
director; staff of 27

ANNUAL OPERATIONS BUDGET:

\$6.1 million

WEBSITE:

www.maranaaz.gov



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“It’s definitely a huge challenge. We have to transition to renewable water sources as soon as possible.”

John Kmiec



Jeff Smith takes a sample at the Marana Wastewater Reclamation Facility.

In one innovative approach, Marana Water contracts with a large agricultural operation so that the farm uses a portion of the CAP water assigned to the utility, while Marana obtains credit for the groundwater the farm would have pumped from the aquifer. “Overpumping has led to disasters in the past,” Kmiec says. “This way, we use all the CAP water allocated to us. It just works out better for us financially and is more environmentally sustainable.”

In addition, Marana has brought its new wastewater reclamation facility online and is getting credits for the treated water it is putting back into the aquifer. The plant features a four-stage Bardenpho process, followed by sand filtration and TrojanUV disinfection system. Design flow is 1.5 mgd, with current flow around 0.5 mgd. The new facility is a Carollo Engineers design, and the construction manager was PCL.

(Arizona water credits reward utilities for banking groundwater for at least one year and allow these utilities to pump and use the water in the future.)

Water conservation

Marana Water is a member of the Water Con-

servation Alliance of Southern Arizona, an organization devoted to drought-proofing water-conscious desert communities in its membership. The alliance offers a variety of water conservation materials to customers, including conservation literature, tips for desert landscaping and information about water saving appliances.

Marana Water also provides the use of water meter monitors to customers who wish to identify where (i.e., appliances, leaks, etc.) in their home they are using the most water. The monitor allows them to see their water usage between their monthly meter readings, which in turn makes the customer understand where their water is going so they can set up a water savings approach.

Data on the city’s website from 2014-15 reflects about an 8 percent decrease in water usage by Marana customers and an even larger decrease during the high water usage months of June and July.

The future

With Colorado River flows diminishing and levels dropping in Lake Mead, how does Kmiec feel about a sustainable surface water supply?

“The river is under drought condition,” he says. “If Lake Mead goes below 40 percent of its

normal volume, reductions may take place that will dictate the amount of water the lower states of California, Arizona and Nevada can obtain.”

If that happens, he expects “lots of negotiations about how to address the issue, involving the Bureau of Reclamation, which controls the river.”

Reduction in water supply could well impact community growth, but Kmiec applauds the Arizona Groundwater Management Act of 1980 and the water bank that Arizona has been contributing to for many years. “That could make up the difference,” he says. But he adds, “Water is always on my mind; we’re always looking for supplies.”

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KEEPING IT CLEAN

Contamination has been detected in two water systems in the Marana (Arizona) service area, and — as a demonstration of its commitment to clean water — the town is making a significant investment to treat the contaminants.

Perfluorinated compounds (PFCs) and 1,4 Dioxane — both unregulated compounds — have been detected in the systems at levels that exceed current Environmental Protection Agency health advisories.

Recently, the Marana Town Council voted to build two new water treatment campuses that may employ a combination of ion exchange, granular activated carbon, with advanced oxidation to deal with the compounds.

John Kmiec, water director, says the cost to build the two new facilities ranges from \$12 to \$15 million and most likely will be funded by the Water Infrastructure Finance Authority of Arizona, grants and service rates. The two treatment facilities are expected to be completed and put into operation by 2020. They will pump between 1,000 and 2,000 gpm and serve about 3,000 connections.

Meantime, Marana and the city of Tucson have filed a joint lawsuit against five companies that manufactured and sold a firefighting product containing certain PFCs. The suit seeks to recover all costs associated with the contamination mitigation, including the expense of the new facilities.

The Marana Council's vote to proceed with the new clean-water facilities was unanimous. In a press release, council member Roxanne Ziegler reaffirmed the importance of water to Marana: "I do believe this town needs to provide clean water," she says. "I am in favor of getting this done immediately."

than having the different municipalities pumping from different groundwater deposits, the agencies agreed to consolidate recharged groundwater in a central location and provide each with the ability to pump to its service area as needed.

It's a 50-year agreement called the Northwest Recharge, Recovery and Delivery System, and it won a Metropolitan Pima Alliance Common Ground Award for community collaboration.

Kmiec says a common groundwater wellfield will be constructed north of the Marana Airport west of I-10, and each community will share in a

7-mile joint pipeline that will bring the water to a central location. In turn, each entity will have its own booster station to be able to pump water it needs for its respective service area. Expected to become operational by 2023, the project will reduce the risk of individual communities exhausting separate groundwater supplies and will allow the north Tucson-area aquifer to recover from decades of overpumping.

Kmiec praises the intercommunity cooperation. "You don't always find municipalities willing to cooperate like this." ♦



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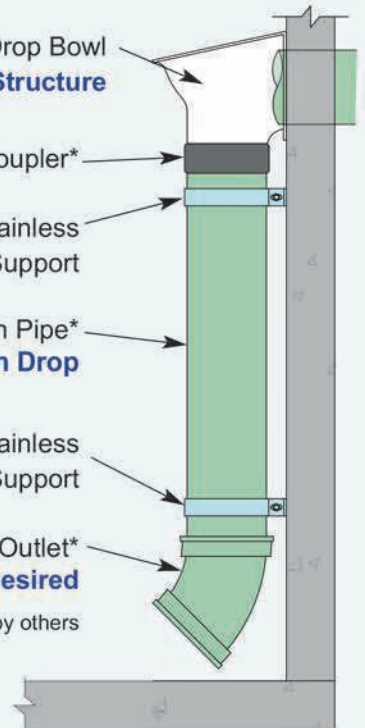
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WINNING TEAM



“When it rains here, it rains in the summer for three months, then it’s dry the rest of the time.”

Andy Koebel



Bonita Springs Distribution and Collections Supervisor Mike Prescott walks on site to inspect a water service replacement project. (Photography by Ryan G Photo)

Bonita Springs Utilities earns repeat recognition for innovations and performance

By Erik Gunn

Winning is beginning to look like a habit for the Florida community of Bonita Springs.

In a nine-year period, Bonita Springs Utilities has been a six-time winner of the American Water Works Association Florida Section’s annual Water Distribution System award for its division (for systems with 20,000 to 29,999 connections): in 2009, 2011, 2012, 2014, 2015 and most recently 2017.

You can credit a culture of safety, innovation, attention to detail and teamwork for the repeat honors, says Andy Koebel, director of operations for BSU. Most of all, he credits the water distribution department’s employees. “They really do a good job,” he says, matter-of-factly.

Population swings

Located on the southern Gulf Coast of the Sunshine State, Bonita Springs is about 150 miles south of Tampa, 30 miles south of Fort Myers and 15 miles north of Naples. Like much of the surrounding area, it’s a heavy draw for tourists and snowbirds; the population that the BSU serves nearly doubles from about 50,000 year-round to 100,000 in the winter.

Although the official number of connections in the water distribution system is just under 30,000, it’s the equivalent of more than 47,000, according to Kim Hoskins, BSU’s director of engineering.

BSU’s water supply comes from groundwater wells, some of which supply freshwater, which is treated by lime softening, and others that yield brackish water requiring further treatment, with reverse osmosis, Koebel explains.

The region is flat, like most of Florida, so the utility must rely heavily on pressurized water distribution pipes instead of gravity-fed lines. Similarly, about one-third of the utility’s 450 miles of wastewater collections pipe is force main (the other two-thirds is gravity-fed). The sewer system also includes 345 lift stations.

Versatile crew

BSU is a nonprofit, customer-owned utility operation with three divisions: wastewater collection and treatment, water treatment and distribution, and general management, which includes customer service, engineering, information technology, finance and administration. The utility’s 131 employees are divided roughly equally among the three divisions.

But many of the employees are cross-trained, Koebel explains. Most operators in the utility are licensed both for water and wastewater, giving the crews additional flexibility to go where they’re needed.


The water distribution department repair crews oversee maintenance and repairs for pressurized lines on both the water and the sewer side, “basically because our water distribution department has all the heavy equipment,” Koebel says.

Seasonal challenges

Seasonal swings in both the population and the weather pose challenges. “When it rains here, it rains in the summer for three months, then it’s dry the rest of the time,” Koebel says.

And that dry season is when the winter population boom happens. During those months, “we have to be capable of providing water for all of those equivalent residential connections,” Hoskins says.

But slow months can be problematic, too. In the summer, when the population drops to its lowest level, Koebel adds, “the water doesn’t get turned over as much, so the water quality tends to go down and the distribution system requires increased flushing.”



“If somebody calls with a complaint, we try to respond very quickly to resolve anything that might be causing a problem.”

Andy Koebel



PROFILE:

Bonita Springs Utilities,
Bonita Springs, Florida

POPULATION SERVED:

Approximately 50,000 year-round, doubling in the winter season to about 100,000

SERVICE AREA:

Approximately 60 square miles: the City of Bonita Springs, parts of the Village of Estero and parts of unincorporated Lee County

WATER VOLUME:

17.5 mgd capacity, 9.7 mgd annual average, peak flow of 13.3 mgd

NUMBER OF EMPLOYEES (WATER DIVISION):

44

INFRASTRUCTURE:

467 miles of water mains

NUMBER OF WATER SERVICE CONNECTIONS:

29,979

ANNUAL WATER DIVISION OPERATING BUDGET:

\$10,300,000

WEBSITE:

www.bsu.us

The utility’s routine maintenance program includes a comprehensive line flushing program conducted at 600 points in the system “that we sample and flush at least quarterly,” Koebel says. The flushing program was among the reasons the utility got its 2017 award, he notes.

Line replacement project

BSU is three years into a major replacement project for its water distribution lines. The project is replacing PVC — and, in some places, asbestos cement lines — and in the process upsizing the lines’ capacity, especially where they feed fire hydrants. The replacement pipes are all PVC and designed to withstand higher pressures than the lines being replaced.

In older segments of the system, the pipes being replaced are as small as 2.5 inches in diameter — “obviously not big enough to carry fire flows,” Hoskins points out. Replacement lines are from 4- to 8-inch-diameter pipe and, in some locations, as much as 10- to 12-inch pipe, “depending on whether we’re replacing an arterial line or a service line.”

The water distribution rehab program started in 2015 after “we started seeing an increased number of breaks in smaller, older pipelines,” Koebel explains. In addition, while population and development had grown, outlying parts of the utility’s service area lacked fire hydrants. Those revelations “helped that decision along,” he says of the rehab project. “We knew that it needed attention.”

The program is forecast to be complete by



Alex Roberts and Javier Sandoval replace a corroded residential water service.

work, the utility often arranges to restore use of the old pipe each evening. “It does slow the project down, but it is the least impactful to the customer,” Koebel says.

Crews also try to put the replacement pipe far enough away from the line it’s replacing so that the old pipe isn’t exposed to a possible break that would further inconvenience customers while it’s still in use.

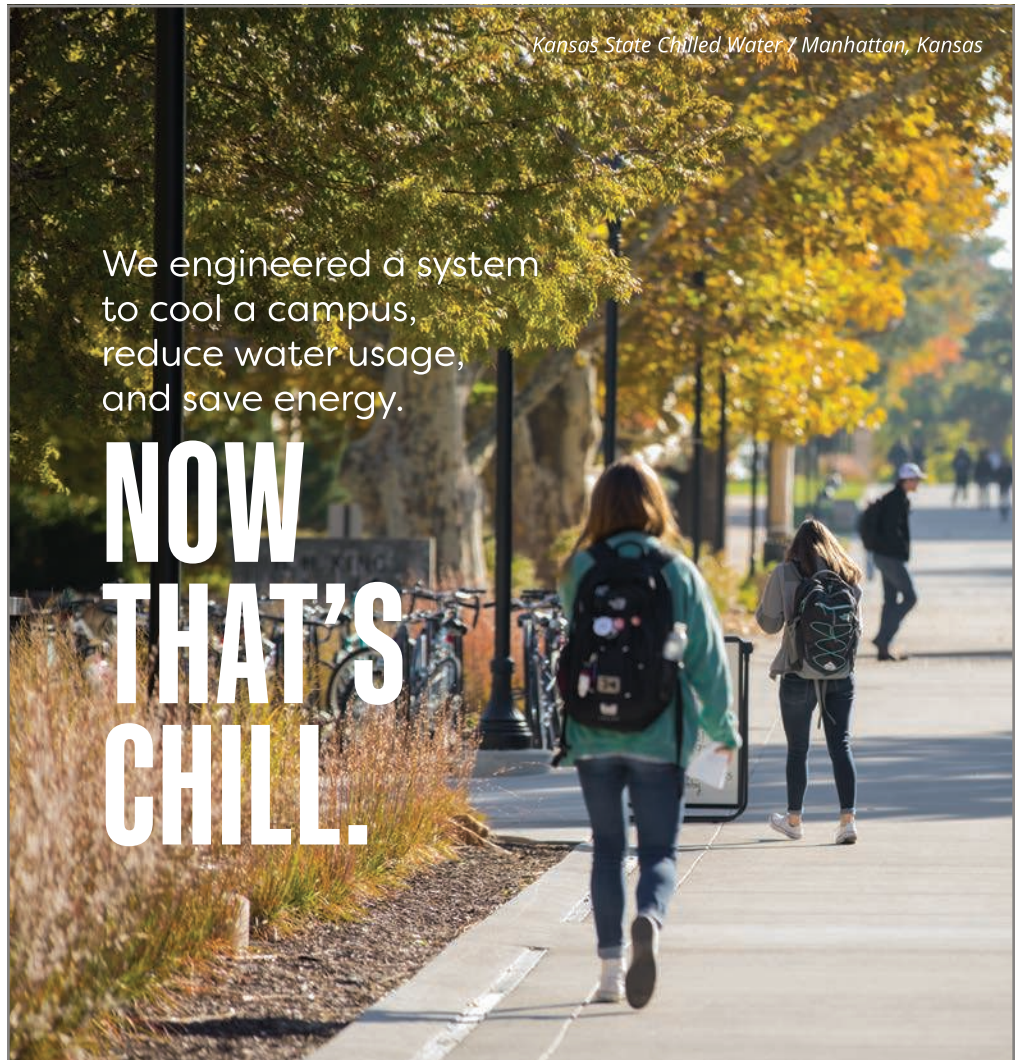
As areas have been identified for repairs, “we’ve attempted to prioritize,” Hoskins says. Segments of the system with higher volumes of water transmission and a high record of service calls from the utility get to the top of the list. When

work is slated for a high-priority spot, the surrounding area is also put on the list, “so we don’t jump across town too much,” she adds.

Maximizing communication

To make sure customers understand what’s going on, BSU’s website has a construction page that outlines the overall plan as well as details of its first phase now underway and the expected sequence of upcoming projects “so folks can see when we’re planning to be in their area,” Hoskins says.

Before a project starts the utility holds public meetings to explain the details and what to expect



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2030. That date is somewhat soft, however. “A lot of that is going to depend on the market and what we can budget every year” for the replacement and rehab program, Hoskins says. For now, the utility has replaced about 25,000 linear feet — not quite 5 miles — of water pipeline, Koebel says.

Minimizing disruption

With such an ambitious project, BSU has worked to minimize disruption to water customers through a variety of tactics. Individual project segments are usually kept relatively short so that they can be completed quickly and inconvenience a small number of customers at any one time, Hoskins and Koebel say.

While water might be shut down during the

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The Bonita Springs Utilities team includes distribution tech Dominic Rodes, Distribution and Collections Supervisor Mike Prescott, Director of Operations Andy Koebel, Director of Engineering Kim Hoskins and distribution tech Gage Schield.

during the service disruption. Follow-up actions may include invitations to residents of an affected neighborhood to visit BSU facilities.

“We also have a very good complaint system,”

Koebel says. “If somebody calls with a complaint, we try to respond very quickly to resolve anything that might be causing a problem.”

NO BOILING REQUIRED

Bonita Springs Utilities is used to thinking outside the box.

Take the utility’s decision to install backflow prevention devices throughout the system.

Literally.

With nearly 30,000 service connections, “there’s a backflow prevention device on every one of them,” says Andy Koebel, director of operations for the Florida water distribution and wastewater collection utility.

And the devices were installed — and are regularly tested — all at the utility’s expense.

For Koebel’s agency, it was a straightforward and sensible trade-off.

The action was a response to a state regulation that requires utilities to inspect every connection to determine whether there was a well or other auxiliary water source that could interfere with the distribution system.

Putting a backflow prevention device at each connection eliminated the need for that periodic inspection, Koebel explains. The utility also absorbs the cost of regular testing and maintenance for the backflow prevention units rather than saddling ratepayers with the task.

What did BSU get in return?

There’s not having to inspect every property for an auxiliary source of water. But it’s more than that. Simply put, the backflow installations “provide us the highest level of security for our water system that we can provide as far as that goes,” Koebel says.

And it sharply reduces the need to issue boil-water notices when a line breaks or water pressure drops, he says.

A few years ago, after a water transmission line broke, BSU officials were discussing with a local county health official whether a boil-water notice would be needed. Yes it would, the official responded, according to Koebel — unless, if what the official seemed to expect was highly unlikely, there was a backflow prevention device at every service connection.

“I said, ‘Hey, we do have one,’” Koebel recalls. Clearly surprised, the official asked, “You do?”

“And I said, ‘Yes, we have one at every connection.’”

Result: No boil-water notice needed.

“We do a lot of work in-house. The water distribution crews are well-versed in a lot of different things.”

Andy Koebel

Employee versatility

BSU has also worked to bring more of its routine maintenance work in-house, training its crews on work like valve replacement, asphalt repair, concrete work and a variety of other tasks.

“We do a lot of work in-house,” Koebel says. “The water distribution crews are well-versed in a lot of different things.” Doing more work in-house expands the skills of everyone working for the utility and saves ratepayers money, he observes.

Tech solutions

Innovation comes in other forms, too.

For several years now, BSU has been essentially paperless in its handling of service orders. Field crews have tablets and use digitized forms to record work orders and outcomes. The information is recorded to an Esri-based series of collector applications for tablets or smartphones.

“We’ve implemented a lot of work in our GIS program that we’re using to track maintenance and other activities in the system, such as air-release valve maintenance, any flushing in the system — all that’s done through our GIS-based collector apps that we have developed,” Koebel says.

Hoskins adds, “Our field staff uses a form that was created using this app that asks specific questions, essentially stepping them through the work that has to be performed and collecting data as they’re doing it. We can see all this information spatially. We can organize areas where you see the work getting completed.”

The system comes in handy with the flushing program, too: When lines are flushed, information is recorded on the volume of the flush and residual chlorine in the water, along with other data.

‘Very proactive’

Other utilities may be using similar tools, but Koebel believes BSU may be an early implementer, based on his conversations with others in the industry. “We’re very proactive in getting that kind of technology in our system,” he says.

It’s the same kind of proactivity that’s reflected in the decision to undertake the long-term pipe replacement project, bring work in-house and seek out opportunities to innovate.

And with that spirit, it wouldn’t be surprising if there’s a seventh trophy in the utility’s future. ♦

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DON'T CAVE UNDER PRESSURE

Follow this detailed checklist of the proper actions to take if the unthinkable happens

By David Dow

Let's assume your municipal crew has an excellent safety program. You've been trained and designated as the competent person on project excavation sites. All the workers on your crew have been appropriately trained. You use trench-protection systems on your job sites. You have an emergency plan in place, and so on.

Let's also assume that a contractor at another site nearby the one you're working on has taken a few shortcuts. Suddenly, one of that contractor's workers comes yelling, "A man's been buried! We need your help! There's been a cave-in!"

What do you do? Here are some suggestions:

- Stay calm.
- Take charge of the job site until a trained team, headed by an "incident commander" (the term often used by firefighters and rescue/recovery teams), arrives.
- Safely get everyone who is not trapped out of the trench. Account for all workers.
- Call 911 and/or the company's rescue team, and report the cave-in. If the construction site is difficult to find, designate someone to meet the trained rescuers at a readily identifiable address or landmark and direct them to the cave-in location.
- Keep everyone who is not directly involved in the rescue/recovery at least 100 feet from the trench or excavation.
- Shut down all equipment, except pumps that are being used to remove water in the immediate vicinity of the cave-in.
- Stop or reroute traffic that might create vibrations and cause a secondary cave-in.
- Do not attempt to dig the victim out with a backhoe or excavator. Such equipment may further injure the victim.
- Do not remove the victim's tools or equipment. They can be helpful in locating the victim.

In addition, the following information should be gathered:

- Number of workers trapped
- Where the victim(s) was last seen



- The time the cave-in occurred
- The depth of the trench
- The soil type
- An estimate of how much soil has collapsed on the victim
- The presence of any potentially harmful atmospheres
- The location and condition of all underground utilities.

There may be a very strong temptation to jump down into the trench and try to dig the victim out. Do not do it. Untrained or ill-equipped rescuers frequently become victims themselves from secondary cave-ins.

Of course, the one thing that's better than all these measures is avoiding a cave-in in the first place. Do it right the first time so that a rescue is never necessary.

Remember: Use protection. It will save your life. ♦

About the Author

David Dow is co-founder of TrenchSafety and Supply and is also chair of the Training Committee for the North American Excavation Shoring Association.



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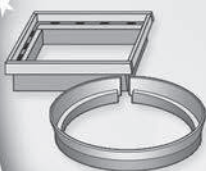
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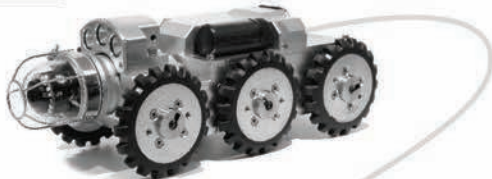


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steerable tractor. No lengthy, manual field calibration is necessary — simply place the profiler in the pipe and begin instantly. As it travels through the pipeline, it performs conventional CCTV inspection while taking accurate joint and crack measurements using the integrated laser diodes. On the return trip to the manhole, the rotating camera head analyzes the pipe profile via spinning laser technology. All data is instantly and accurately generated on site using the POSM software. There is no third-party analysis involved, thus providing immediate and reliable evaluation of the pipe right on site. It can be used in pipes 6 to 48 inches. **717-709-1005; www.rauschusa.com.**

LOCATORS

RIDGID NaviTrack Scout Locator

The **RIDGID NaviTrack Scout Locator** is designed to solve demanding remote transmitter (sonde) locates using multidirectional locating technology. Its multidirectional antenna technology sees the entire signal all of the time. Simply maximize the signal strength and you have found the target. There are no nulls or false peaks to complicate the locate. It verifies the locate position using a micro-mapping display to mark distinctive poles in front of and behind the target, ensuring an accurate locate. Depth is automatically calculated and displayed when over the target. It weighs 3 pounds, runs on four C-Cell batteries and has an approximate battery life of 24 hours per charge. **800-769-7743; www.ridgid.com.**



Schonstedt Instrument Rex

The **Rex (Receiver + Xmitter)** multifrequency locator from **Schonstedt Instrument** is less than 2 inches thick and weighs less than 3 pounds. The pistol-grip receiver extends for greater sensitivity and retracts for easier carrying and storage. At slightly over 7 pounds, the entire system fits easily into a custom shoulder bag. The Multi-Purpose Combo Kit (MPC-Rex) includes a GA-92XTd magnetic locator and a Rex multifrequency pipe and cable locator. **800-999-8280; www.schonstedt.com.**



Vivax-Metrotech vLoc3-Cam

The **vLoc3-Cam** sonde locator from **Vivax-Metrotech** includes advanced filtering and omnidirectional antenna technology that makes sonde locating fast, easy and accurate. The bright full-color graphical display directs the user to the sonde with directional arrows. When on top of the sonde, confirmation is provided with a large sonde icon and depth reading. The Pushrod Trace mode shows a second display for tracing the path of the



pushrod deployed in the pipe or tracing utilities with an optional portable transmitter. Passive locate modes of Power and Radio will detect the presence of live power lines, CATV, telephone and metallic pipes that radiate 60 Hz from nearby or overhead power lines. **800-446-3392; www.vivax-metrotech.com.**

MAINLINE TV CAMERA SYSTEMS

ADS Environmental Services CleanView

CleanView from **ADS Environmental Services** is a cleaning and wireless video system enabling field crews to immediately view the work site pipe. It combines a cleaning nozzle and high-definition camera. Attached to the jetter hose, video is captured as it travels through the pipe. The nozzle/camera propels and cleans pipes from 6 to 60 inches simultaneously. Root or grease blockages are immediately identified for on-the-spot action. It also provides a video record of the work site, enhancing quality control. Its vivid, crisp video reveals structural issues and is used to prioritize ensuing video inspection. It provides live, wireless video for 18-inch-plus pipe. In smaller-diameter pipes, video is downloaded from the camera to a tablet in seconds, all from the bottom of the manhole. **800-633-7246; www.adsenv.com.**



Electric Eel Ecam Pro 2

The **Ecam Pro 2** mainline pipeline inspection camera system from **Electric Eel** has a stainless steel-housed, 1.68-inch self-leveling color camera with sapphire lens; 20-LED light ring with an impact-resistant polycarbonate light ring cover; and high-resolution CCD element. The auto-iris adjusts light automatically. A flexible camera spring navigates 3-inch P-traps. The unit comes standard with 200 feet of braided fiberglass premium 1/2-inch-diameter pushrod (with a capacity of 400 feet available on the reel), industry-standard 512 Hz sonde, 10.4-inch daylight-readable monitor with click-touch controls, and one-touch recording directly to a USB flash drive. It has an on-screen footage counter, a two-hour battery with built-in charger, adjustable light controls, 16 pages of text writing with memory saves, voiceover recording, an 8x zoom function, audio/video out jacks, 8-inch wheels for easy maneuverability, a secure-locking reel brake, and rugged powder-coated steel tube-and-bar construction. **800-833-1212; www.electriceel.com.**



General Pipe Cleaners/General Wire Spring Gen-Eye X-POD

The **Gen-Eye X-POD** from **General Pipe Cleaners/General Wire Spring** offers a command module with a USB port to record on a flash drive. The lightweight unit combines camera, reel and monitor into a compact package. It comes with a 7-inch LCD color monitor, one-touch recording, digital zoom, voice-over recording, date and time stamp, and a flash drive

(continued)

capacity indicator. It includes a 3-foot probe rod with color camera for inspecting hard-to-reach places. The full-size unit includes a self-leveling color camera and 200 feet of Gel-Rod for inspecting 3- to 10-inch drainlines. The compact Mini-Reel carries 100 or 200 feet of Gel-Rod with mini color self-leveling camera for troubleshooting 2- and 3-inch lines. The rugged steel frames and reels include a drag brake and reel lock. The full-size reel has 10-inch wheels. **800-245-6200; www.drainbrain.com.**



Hathorn Magnum M7

The **Magnum M7** from **Hathorn** is packed with multiple features and is extremely lightweight at only 29 pounds. The unit can easily be carried down a flight of stairs or rolled on its 6-inch wheels. The 7.4-inch monitor delivers a clear, bright picture and is covered by an acrylic shield for durability. It offers USB recording, two-hour lithium battery, on-screen footage counter, 512 Hz sonde transmitter, adjustable lighting and text writer. A Wi-Fi transmitter can be added for recording to a mobile device. It comes with a variety of pushrod lengths and camera sizes to fit every job type. **905-604-7040; www.hathorncorp.com.**



MyTana Mfg. PGR400

The **PGR400** from **MyTana Mfg.** can be used to inspect 4- to 12-inch lines with 400 feet of rugged pushrod and comes with a 512 Hz locator. The system's 1 1/2-inch, color, self-leveling camera head includes a built-in 512 Hz sonde transmitter, high-intensity LEDs and an extended-focus lens for wide-angle viewing. A built-in, 12-inch, daylight-readable monitor delivers high-clarity footage, and all-digital recording lets the user save that footage to either the 64 GB internal drive or removable USB flash drive. Operators can also stream video wirelessly to multiple devices. A 3-inch protective skid for the camera head helps navigate bends. Rechargeable batteries deliver up to 3 hours of service. The included 512 Hz locator provides continual depth readout, directional indicators and intuitive operation with audio feedback. **866-948-7576; www.mytana.com.**



Pearpoint/SPX P342

The **Pearpoint/SPX P342** with the Plumbers add-on is a combination of convenience and performance, offering users one system for confined work areas and ease of use in congested work sites. This equipment requires just one universal command module to operate and offers an option of a 1- or 2-inch camera. The 2-inch camera is self-level-



ing, keeping the video picture upright when navigating pipes. **800-688-8094; www.pearpoint.com.**

RapidView IBAK North America ORPHEUS HD

The **ORPHEUS HD** inspection camera from **RapidView IBAK North America** offers full 1920x1080 resolution, providing clean, crisp HD video along with high-resolution pictures. It is ideal for large-diameter pipelines 6 inches and up, and it offers pan-and-tilt capabilities, 10x optical zoom and 12x digital zoom, laser measurement, autofocus and powerful LED lighting. The camera uses lights set into the camera head at an angle that specifically illuminates inside pipe joints and gaps, allowing the user to see clearly without obscuring shadows. With its higher resolution, the user can zoom closer and inspect up into laterals while maintaining high picture quality. **800-656-4225; www.rapidview.com.**



Ratech Electronics Elite SD/USB Wi-Fi

The **Elite SD/USB Wi-Fi** pipeline inspection camera system from **Ratech Electronics** records pipe inspections wirelessly to an iOS or Android device and takes live video and digital still photos that can immediately be uploaded to YouTube. A smartphone app allows video to be streamed wirelessly. The Wi-Fi interface is available on any current Ratech Electronics product or existing Ratech Electronics systems in the field and is available with a sun-readable, 10-inch LCD monitor and either a self-leveling camera, small ultramicro camera or pan-and-tilt push camera. A built-in battery is optional. Users can also record to a USB stick or SD card if Wi-Fi isn't required. Systems come in cable lengths from 100 to 400 feet. **800-461-9200; www.ratech-electronics.com.**



Trojan Worldwide CI00-512SL

The **CI00-512SL** self-leveling color camera system from **Trojan Worldwide** is a lightweight, easy-to-operate system designed for 1 1/2- to 4-inch lines. It has a 1-inch, self-leveling waterproof color camera head with adjustable LED lights. The 512 Hz sonde transmitter is built into the spring of the camera, which allows more flexibility when maneuvering around sharp turns, and also creates a stronger signal for locating. The system has a 115-foot durable pushrod and a built-in footage counter. The display screen is a 7-inch LCD with DVR, with SD card recording and a built-in microphone for voice recording. The built-in battery offers seven hours of runtime and has an AC adapter for charging or direct power. Also included is the SD card, USB adapter for the SD card, protective visor, two skids and a waterproof case for the entire system to fit in for easy transportation. **800-392-4902; www.trojanworldwide.com.**



Wohler USA VIS 700

The **VIS 700** high-definition inspection system from **Wohler USA** provides flexible features needed for a variety of inspection applications. It offers razor-sharp, high-definition images; zoom; a focus function via joystick for precise inspection; and the ability to stream live images and video via wireless LAN. It comes with a removable touch-screen monitor with adjustable hand-grip; automatic screen rotation; on-screen keyboard for notes; a voice-over recording option; an easy-to-clean, removable pushrod; and variable pan-and-tilt speed via joystick. **978-750-9876; www.wohlerusa.com.**



RECORDING/ARCHIVING/DATA DEVICES

Hermann Sewerin GmbH SePem 155

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



InfoSense Sewer Line Rapid Assessment Tool

The **Sewer Line Rapid Assessment Tool**, or **SL-RAT**, from **InfoSense** uses active acoustics to provide a quick view of blockage conditions within gravity-fed sewers. The test takes three minutes with no flow contact. It allows a crew of two to inspect 10,000 to 20,000 feet per day. It is Environmental Protection Agency-validated and GPS-enabled. Data can be downloaded to the **Sewer Line Data OrGanizer**, or **SL-DOG**, cloud application for visualization in Google Earth or integrated with enterprise/GIS applications. **704-644-1164; www.infosense.com.**



SubSurface Locators LD-18

The **LD-18** digital water leak detector from **SubSurface Locators** reduces ambient, intermit-

tent noises from dogs barking, cars passing by, footsteps and people talking. Its digital electronics sample the sounds every few thousandths of a second, and if it detects an intermittent sound, it suppresses it instantly. Water leak sounds are almost always continuous noises, and the unit can identify continuous leak sounds, even in difficult conditions like busy streets. **775-298-2701; www.subsurfaceleak.com.**

SOFTWARE

CUES GraniteNet

GraniteNet from **CUES** is next-generation condition assessment software for the public works industry. It is asset-based, which enables the software to easily interface with other asset-based software products such as ESRI ArcGIS Mapping systems and asset management systems to include Cityworks, INFOR, IBM Maximo and others. Intuitive and easy to use, data and video can now be accessed via a web portal. **800-327-7791; www.gnet.us.com. ♦**





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Effortless pipe inspections drive success for sewer authority

Problem:

Every day, millions of gallons of water and wastewater travel through underground pipes to be treated, distributed or consumed. According to a 2018 study by Utah State University, water main breaks in the U.S. have increased by 27 percent in the last six years. The majority of these breaks occur on pipes that are more than 50 years old — nearly 30 percent of all installed mains. The Orange Water and Sewer Authority in North Carolina was one that was tasked with caring for this otherwise invisible underground infrastructure.



Solution:

The authority uses **Cityworks** and ArcGIS to track not just their physical assets, but also the work, materials, cost and inspection data associated with those assets. Additionally, Cityworks development partners at WinCan created an interface that allows OWASA to track pipe condition data collected from regular CCTV inspections. When OWASA field crews are assigned a CCTV inspection, they can access the Cityworks work order digitally in their truck. Once the inspection is complete, the data and media files collected by WinCan automatically populate the appropriate Cityworks inspection fields. Hyperlinks to the CCTV videos are included in the GIS data for specific pipe segments, which means OWASA engineers can view the GIS data and media files within ArcMap.

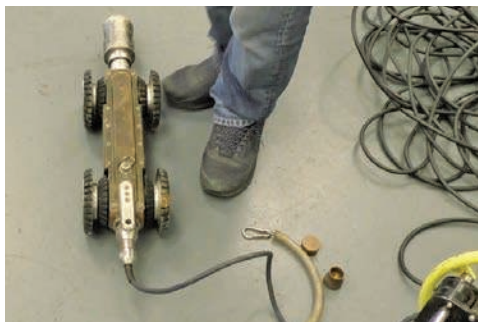
RESULT:

Because this information is available through a map in a single environment, OWASA engineers can plan with greater awareness, putting them on a path to sustainability. **801-523-2751; www.cityworks.com.**

Crawler camera videos 3.4 miles of storm sewer lines

Problem:

A customer in Canada had to inspect 3.4 miles of storm sewer lines that varied in size from 12 to 48 inches. These inspections included running up and down through 185 manholes. They needed something heavy-duty to cover all this distance, something easy to configure for different diameters and something reliable.



Solution:

Fiberscope.net recommended the **Stormer S3000** pipe crawler set, with 656 feet of Kevlar-reinforced cable; a strong, durable, variable-speed drive-train; a color high-quality pan-and-tilt CMOS camera head; advanced LED lighting; and easy-to-use attachments including larger-diameter wheels, and a camera riser system for the larger lines. This unit came with a 10.4-inch monitor and built-in digital video recorder, on-screen footage counter and keyboard to capture accurate videos of their inspections and document which site they were at and how much of the storm line had been inspected. As this unit is compatible with WinCan, reports were easy to generate.

RESULT:

According to the customer, “The Stormer crawler unit was very good for my application. This unit is very fast to change for different size lines, and it has a very clear picture. The only maintenance I’ve had to do is change the connection on the spool because of where the safety cable connects with the Kevlar. I figure that is just normal maintenance.” **800-239-9934; www.fiberscope.net.**

Contractor nabs market niche with specialized inspection vehicle

Problem:

Terrell Harmon, the owner of Harmon’s Pipe Service, primarily sub-contracts to large new subdivision builders in metro Atlanta. Harmon’s Pipe Service began specializing in inspecting outfalls and other assets requiring off-road access. “Most of my calls were coming for off-road jobs. I guess the big vans couldn’t get video equipment to these places. All sewer lines leave the road eventually. Some go through the woods, down to outfalls in more distant and less-travelled areas. I knew carving out a niche for myself in the market was a good strategy.”



Solution:

In 2000, Harmon approached **Cobra Technologies** about building out a complete CCTV system he could mount on a UTV, like a Polaris or Gator. This setup was intended to get his equipment out where the landscape is more rural, and there aren’t many wide, well-maintained roads. Cobra Technologies built Harmon’s UTV-based inspection system, including their Asset-DMS PACP-certified data collection and analysis software. They ultimately ruggedized the unit with diamond plate panels.

RESULT:

Though it was something of a financial risk, Harmon had studied the jobs coming in and where his market was going. His hunch paid off: He recouped his investment in only about 18 months and now has a lock on the off-road inspection segment of his market. **800-443-3761; www.trio-vision.com. ♦**



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Product Spotlight

Easily bring a meter pit to grade

By Craig Mandli

As an alternative to housing a water meter inside a structure, a meter pit can be a convenient timesaver and typically is available with many options. But while there are many benefits surrounding this meter housing option, there is always room for improvement. A.Y. McDonald took that idea to heart with their new 795 Series Top Adjustable Coil Meter Pit Assembly.

With the ability to be adjusted at the top after the pit has been installed, the meter pit assembly improves on the typical meter pit. It is designed to provide up to 18 inches of adjustability on 15- and 18-inch-diameter PVC due to the addition of a molded poly top on the PVC pipe.

“This allows the installer or municipality to adjust the pit to grade after the pit has been buried without digging up the entire pit,” says Rick David, a water works product manager for A.Y. McDonald. “This adjustable retrofit top can be utilized on any 15- or 18-inch PVC irrigation pipe.”

At the end of the day, according to David, the adjustment makes it easier to set the top of the pit to the final grade, which leads to an added convenience and timesavings in the field. Constructed of robust rotomolded poly material with UV inhibitor, this top-adjustable feature allows the installer to set the pit before the finish grade is determined, saving time and money.



The top adjustment is designed for 18 inches of adjustability to allow for the pit to be set to final grade when the time is right. If ground settling occurs, this simple design allows for easy adjustment many years after the pit was set in place without digging the entire depth of the pit. The adjustment came at the behest of the company’s clients.

“Inquiries were made to our customer base to define pain points our customers were having with existing settings on our meter housing,” David says. “From that point, our engineers defined what would be required to eliminate these pain points and then find a supplier that could make this for us. The total process took a couple of years.”

The 95 Series Top Adjustable Pit Retrofit kit can be easily installed on top of any 15- or 18-inch diameter SDR-51 PVC pit that is already installed and is in need of adjustment. **800-292-2737; www.aymcdonald.com.**

Reed Mfg. copper shut-off tool



Copper service lines need maintenance and repairs, and a shut-off tool expedites the work. In response to customer requests, Reed Mfg.’s CSO1R copper shut-off tool now offers a detachable, ratchet handle and a heavy-duty storage case. The copper shut-off tool is easy to use since the ratchet handle can be positioned and then repositioned at the best advantage point for the operator. An included support handle can be attached in two different, perpendicular angles, as the job requires. The tool is lightweight at 10.5 pounds, but has a very strong frame. Its body casting is black chromate steel for superior tool strength. Two grease fittings for lubrication and a zinc-plated, threaded screw for corrosion-resistance are other durable features of the design. **800-666-3691; www.reedmfgco.com.**

Vacall AllJet truck-mounted jetter



The AllJet truck-mounted jetter from Vacall uses a fuel-saving, single-engine PTO design, a 1,600-gallon UV-resistant polyethylene water tank and Vacall’s AllSmartFlow CANbus control system. The controls, protected inside a weather-resistant cabinet, help optimize efficiency with controls for water pump speed and pressure, hose reel adjustment, chassis engine and more. The hydraulically powered triplex plunger water pump is capable of 87 gpm at 2,000 psi, to effectively jet blockages in sewer lines and routinely maintain flow, with other power options available. The hose reel telescopes out 54 inches from a retracted position and swivels 200 degrees to properly direct the 600-foot, 1-inch-diameter jetting hose. **800-382-8302; www.vacall.com.**

Perma-Liner Industries Vinyl Hybrid Resin



The Vinyl Hybrid Resin from Perma-Liner Industries is designed with zero styrene, low VOCs and is a hybrid vinyl ester with high-rigid polymer backbone. The resin has a standard pot life of more than eight hours and uses an easy initiator with 1 percent cumyl hydroperoxide by weight, making it cheap, easy and effective. It can be hot-water or steam cured at a minimum of 140 degrees F held for 28 minutes, with no post cure. The lower cure temperature of 140 degrees F means it is gentler on equipment, and it is an easier temperature to reach for longer shots. The resin has consistent viscosity and is resistant to sag and draining around the vertical surfaces and reinforcement. **888-336-2568; www.perma-liner.com.**

Mr. Manhole Platinum Series Six Shooter



The Platinum Series Six Shooter manhole cutter from Mr. Manhole is designed to make every aspect of the process — cutting, removal and repair process — smarter, faster and safer for crews. It has a heavier mainframe, new Easy-Drive System, and a larger cutting depth and diameter so it is able to complete high-volume repairs quickly and easily. The Six Shooter cuts diameters up to 72 inches and cuts 16 or 20 inches deep with optional blades.

In addition to manhole frames, it can also cut out water valves and make road penetrations to repair utilities using the optional Cookie Cutter Package. Tie-down points on each arm make securing for transport easy and fast. **419-741-9075; www.mrmanhole.com.**

Water Cannon electric clutch series of pressure washers



The heavy-duty, 12-volt electric clutch series of pressure washers from Water Cannon Inc. - MWBE are designed to mount on front of a diesel engine for high-pressure washing on location. It is available in three different pressures from 2,000 to 4,000 psi and flow rates from 4 to 8 gpm. Other features include a continuous-duty hydraulic coupling drive system, an in-line serviceable stainless steel

mesh water filter, stainless steel unitized valves, forged brass manifold and a heavy-duty triplex plunger pump. The thermo-pump protector engages at 140 degrees F, and the adjustable pressure regulator is from 150 psi to the max pressure. **800-333-9274; www.watercannon.com.**

Doosan Portable Power mobile generator

The G400WCU-T4F mobile generator from Doosan Portable Power has a prime power rating of 402 kVA packaged in a compact footprint to meet a broad range of applications. It is powered by a Tier 4 Final Cummins

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Vactor TRUVAC vacuum excavators



Vactor Mfg.'s TRUVAC brand of vacuum excavators are designed specifically to satisfy the safe-digging requirements of businesses or organizations that locate and verify underground utility lines and pipes. The line includes the versatile Paradigm subcompact vacuum excavator, the Prodigy vacuum excavator that offers power and performance in a smaller footprint, and the HXX series of full-sized vacuum excavators to tackle the biggest digging projects. The TRUVAC series can excavate safely around utilities with water or air and can power pneumatic, hydraulic or electrical tools. **800-627-3171; www.truvac.com. ♦**

Sauereisen promotes Michael Briglia to associate material scientist

Sauereisen announced that Michael Briglia has been promoted to the position of associate materials scientist. Working from the company's corporate headquarters, his responsibilities will include new product development, contractor training, technical assistance, inspections on job sites throughout the United States and in-house quality control testing.



Mike Briglia

Prime Resins launches new website, logo

Prime Resins announced it launched a new logo, website and marketing literature. The goal of the new site is to provide visitors with an easier way to learn about products and solutions as well as making it easier to browse information, whether focusing on a specific product, a solution type or an entire market segment. Useful information about services will be on the homepage, and the news and events section will highlight recently completed projects. The site will be constantly updated with helpful information, articles, newsletters, company announcements and client successes.

REHAU announces promotions in its leadership team



Christian Fabian

Theo Haast

Thomas Troeger

Terry Barnaby

REHAU announced promotions in its Americas leadership team and the transfer of the current regional CEO Christian Fabian to head a newly formed technology and performance global services division. He will also serve on the company's group executive board. As of Jan. 1, the regional executive board of REHAU Americas, headquartered in Leesburg, Virginia, includes Theo Haast, serving as president in addition to chief financial officer; Thomas Troeger, filling the newly created position of chief marketing officer; and Terry Barnaby, head of operations.

In addition to his current role as CFO Americas, Haast will also serve as president of business in the Americas region. In his role as CMO, Troeger will assume responsibility for the company's product divisions, including sales, marketing and engineering. Barnaby, who has been with the company for 33 years, will continue to serve on the regional executive board as chief operation officer.

Felling Trailers hosts Sen. Amy Klobuchar

Felling Trailers hosted Minnesota U.S. Sen. Amy Klobuchar during her central Minnesota manufacturing road trip. She spoke to the company's ownership and management about issues such as health care and workforce shortages that manufacturers are facing. During Klobuchar's visit, she spoke about the measures being taken at the federal level to strengthen local workforces.

Felling Trailers is building relationships with area high schools and colleges to introduce modern manufacturing to students and expose them to the career opportunities that exist. Along with offering tours, Felling Trailers also offers a selection of student programs: Careers in the Community provides welding training to high school juniors and seniors, Youth Welding Camp provides basic welding safety and training for elementary to junior high ages, and most recently, Felling Trailers offered a Women in Welding course. All courses are offered free of charge.

VMAC sponsors Nanaimo's Education and Career Fair

VMAC sponsored Nanaimo's Education and Career Fair in December. ECF is responsible for British Columbia's largest career development fair, attracting over 10,000 attendees over five different locations each year. Students visiting the VMAC booth learned about a wide range of career paths, most notably engineering, fabrication, machining, marketing and quality control. Those specifically interested in learning more about VMAC and its in-house manufactured products were given a tour of the demo truck, equipped with various air compressor and multipower systems. ♦

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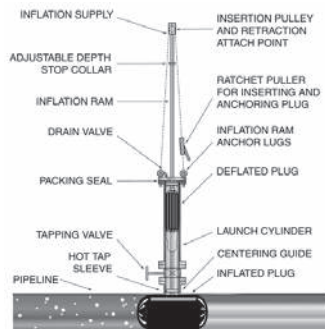
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PEOPLE/AWARDS

The **Water Environment Federation Stormwater Institute** announced the following recipients of 2018 National Municipal Stormwater and Green Infrastructure Awards:

- Lexington-Fayette Urban County Government, Kentucky, Division of Water Quality (Phase I winner for Program Management and Overall Highest Score)
- Louisville Metropolitan Sewer District, Kentucky (Phase I winner for Innovation)
- City of Alexandria, Virginia (Phase 2 winner for Innovation and Overall Highest Score)
- City of Auburn, Alabama (Phase 2 winner for Program Management).

The **1000 Friends of Iowa** presented 2018 Best Development Awards to the following:

- Innovative Leadership: City of Storm Lake for building a sustainable community through stormwater management, flood control, food, youth service and education
- Stormwater Management: City of Algona for its Downtown Green Parking Lot Infrastructure Renewal Project.

Catoosa County (Georgia) officials recognized **Bryant Williams**, stormwater inspector, as a quarterly STAR Award recipient.

ITC Midwest received the 2018 Wildlife Habitat Council Green Infrastructure Project Award for the company's rain garden project at ITC Midwest's Iowa City, Iowa, warehouse. Designed with plants and loose fill, the garden can absorb 4,000 gallons of precipitation runoff. With nearby interpretive signage, employees can monitor the rain gardens and document plant health and the presence of wildlife.

The **American Littoral Society** received New Jersey Governor's Environmental Excellence Awards for a project to restore the inlet to Wreck Pond in Spring Lake and the Clean Water, Beautiful Bay project, which involved a series of initiatives designed to reduce pollution going into Barnegat Bay via stormwater runoff. It's New Jersey's premier awards program for recognizing outstanding environmental performance, programs and projects throughout the state. The program is sponsored by the New Jersey Department of Environmental Protection, the New Jersey Infrastructure Bank and the New Jersey Corporation for Advanced Technology, in partnership with the New Jersey State League of Municipalities.

Robert Allen, who served on the City of Hobart (Indiana) sanitary/stormwater board for 16 years, and his wife, Zeta Allen, received the city's Virginia Curtis Memorial Award. The award honors residents who are making a difference through leadership and volunteerism.

The Fairfax County (Virginia) Board of Supervisors appointed **Randy Bartlett** to lead the Department of Public Works and Environmental Services. He replaces **James Patteson**, who retired. ♦

CALENDAR

March 5-8

American Water Works Association and Water Environment Federation Utility Management Conference, Renaissance Nashville Hotel, Nashville, Tennessee. Visit www.awwa.org.

March 14-16

National Utility Contractors Association Annual Convention & Exhibit, Naples Grande Beach Resort, Naples, Florida. Visit www.nuca.com.

March 23-27

American Water Resources Association Spring Specialty Conference: Setting Conditions for the Success of Integrated Water Resources Management, Embassy Suites by Hilton, Omaha, Nebraska. Visit www.awra.org.

May 8-10

Stormwater and Green Infrastructure Symposium, presented by the Water Environment Federation, Florida Water Environment Association and The Water Research Foundation, Broward County Convention Center, Fort Lauderdale. Visit www.wef.org.

May 19-22

American Public Works Association North American Snow Conference, Salt Lake City. Visit www.apwa.net.

June 9-12

American Water Works Association ACE19 Annual Conference & Exposition, Denver. Visit www.awwa.org.

June 16-19

American Water Resources Association Summer Specialty Conference: Improving Water Infrastructure Through Resilient Adaptation, Nugget Casino Resort, Sparks, Nevada. Visit www.awra.org.

July 7-10

American Society of Agricultural and Biological Engineers Annual International Meeting, Boston Marriott Copley Place, Boston. Visit www.asabe.org.

Aug. 18-22

StormCon 2019, Hyatt Regency Hotel, Atlanta. Visit www.stormcon.com.

Sept. 8-11

American Public Works Association Public Works Expo (PWX), Washington State Convention Center, Seattle. Visit www.apwa.net.

Sept. 9-11

National Rural Water Association WaterPro Conference, Nashville, Tennessee. Visit www.nrwa.org.

Oct. 9-13

American Society of Civil Engineers Annual Conference, Miami. Visit www.asce.org.

Nov. 3-7

American Water Resources Association Annual Water Resources Conference, Sheraton Hotel, Salt Lake City. Visit www.awra.org.

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



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