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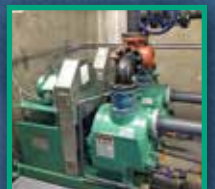
FLUSHING COMPLAINTS AWAY

Massachusetts utility
boosts water quality
with a carefully
executed treatment
and flushing plan

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Dan Rowley
Water & Sewer Superintendent
Shrewsbury, Massachusetts

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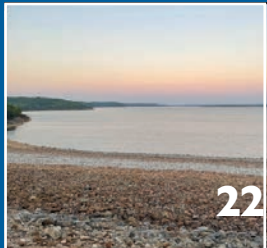
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ON THE COVER: Water & Sewer Superintendent Dan Rowley and his team have improved water quality in the Town of Shrewsbury, Massachusetts, with a comprehensive unidirectional flushing program. (Photography by Scott Eisen)



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Luke Laggis

BLESS THE RAINS

Climate data can help forecast future water supplies and adjust distribution plans.

I live in northern Wisconsin. I'm plenty familiar with snow and cold weather. Freezing rain comes around once in a while, too. But until my local meteorologist explained how it happens on the late news the other night after an unpleasant day of weather, I really had no idea.

If you're unaware, snow forms at a higher altitude and falls. On its way to the ground it passes through a warmer layer of air and melts, but then refreezes as it reaches the ground. Simple, but I'd never really given it much thought.

Precipitation has a significant impact on the work you do, both

positive and negative, but I doubt many people give that much thought either. It funnels through your stormwater systems, causes combined sewer overflow and creates unnecessary treatment costs, but it also irrigates and replenishes surface water sources. It's the latter that ties directly to a special feature in this month's issue about a study that's happening in Kansas, creating models to predict future water availability.

Researchers at the University of Kansas School of Engineering are set to begin a two-year project aimed at creating models using projected climates to help state officials better allocate water. The research aims to expand current models that are

largely based on data recorded during a 1950s drought in an effort to show different climate projections' direct impact on evaporation and streamflow. Ideally it will help with future water allocation decisions in Kansas.

The project is localized to the central and eastern portions of Kansas and incorporates six river basins, 21 reservoirs, 51 inflows and 163 sources of consumptive water use. These new models will compare multiple emission scenarios along with responses from the land, ocean and atmosphere.

Though this work will focus on Kansas specifically, the strategy and end results may benefit municipalities across the country. One of the goals is to inspire municipalities to use climate data in planning for different scenarios, and to show other states and regions an approach for forecasting future water supplies and adjusting water distribution plans.

We talk often in *MSW* about the need to take a proactive approach to utility planning and improvement, and it's hard to imagine a more proactive approach to planning for the future than this. Preparing allows you to respond rather than react.

While I learned a little something from that weather report I mentioned, forecasts are far from guarantees, especially the further out they range. You can plan for a sunny day if that's what the forecast calls for, but you'd be a lot better off if you're also prepared for rain. And since it's impossible to know what the future holds, careful consideration of all the possibilities can make your utilities and communities stronger.

I hope you enjoy this month's issue. ♦

You can plan for a sunny day if that's what the forecast calls for, but you'd be a lot better off if you're also prepared for rain.

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SEEING THE LIGHT

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Technological advancements can be revelatory for business owners, municipalities and their employees, lighting a new path forward in an ever-changing world. In this online exclusive article, a Pennsylvania plumber touts the productivity benefits of Waterline Renewal Technologies' new LightRay UV-casted CIPP system. mswmag.com/featured

OVERHEARD ONLINE

“California needs to refocus its water supply strategy and bolster recent state investments to help ensure we are better prepared for this ongoing drought and for droughts to come.”

— **Utilities Group Comments on California Drought Conservation Order**
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LAGOON DRAINING

‘Sea Dragon’ Unearthed

The routine draining of a lagoon in Britain recently exposed the remains of a Jurassic reptilian sea-dweller called the ichthyosaur — colloquially known as the “sea dragon.” The dinosaur fossil was discovered during preparation for re-landscaping and regrading islands in the United Kingdom’s Rutland Water Nature Reserve. mswmag.com/featured



WATER PRIZE WINNERS

Faster Lead Pipe Replacement

The Environmental Policy Innovation Center recently announced the winners of its Water Data Prize, demonstrating how lead pipes across America can be replaced quickly and equitably to ensure access to safe, clean drinking water. More than 50 organizations and individuals submitted entries aimed at effectively replacing lead water pipes. mswmag.com/featured



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FLUSHING COMPLAINTS AWAY

Massachusetts utility boosts water quality with a carefully executed treatment and flushing plan

By Ken Wysocky

To combat a long-standing water-quality problem, the Town of Shrewsbury Water and Sewer Division in Massachusetts recently completed a comprehensive unidirectional flushing project aimed at removing manganese from its water mains.

The roughly \$800,000 project, funded by water revenues, started in December 2019 and was completed in November 2021. It's the latest in a series of steps the utility has taken over the years to remove manganese from the town's drinking water, says Dan Rowley, water and sewer superintendent for the town, located about 35 miles west of downtown Boston.

The pandemic caused some project delays, Rowley notes. But the flushing program, which uses large quantities of water, also stopped during summers for fear the town's wells wouldn't be able to keep up with the extra demand during the peak-use months.



PROFILE:

Town of Shrewsbury
Water and Sewer
Division, Shrewsbury,
Massachusetts

SERVICE AREA:

About 22 square miles

WATER INFRASTRUCTURE:

207 miles of water mains, 11,500 service connections, 38,000 people served; eight gravel-packed wells, 1,538 fire hydrants, treatment plant handles an average of about 3.3 to 3.5 million gallons per day

SEWER INFRASTRUCTURE:

About 170 miles of sanitary sewer lines, roughly 4,430 manholes, 38 pumping stations, sewage treated by two regional facilities

DAILY WASTEWATER TREATMENT:

About 3.5 mgd

EMPLOYEES:

14

WEBSITE:

www.shrewsburyma.gov/287/Water-Sewer-Division

Jonathan Gonzalez-Rosario, an operator with local contractor Hydra Tech, checks the water pressure while flushing a fire hydrant in Shrewsbury, Massachusetts. The town contracted Hydra Tech to carry out its unidirectional flushing project. (Photography by Scott Eisen)

A local contractor, Hydra Tech, performed the flushing, using a plan developed by Tata & Howard, a firm that's been the utility's consultant since the 1990s. The high-velocity flushing scoured away manganese lining the pipes, as well as tuberculation.

"We used an outside contractor because we'd never done a flushing program before," Rowley says. "We also had no idea about the condition of the water main valves, so we needed a contractor with flushing experience and that could repair any damaged valves."

The water system features about 207 miles of mains, mostly made of asbestos cement, ductile iron and PVC pipes. It includes more than 11,000 service connections and serves about 38,000 people. Water is supplied by eight gravel-packed wells that pump groundwater. The wells vary in depth from 40 to 70 feet; they're located in the northwestern section of the town, near Lake Quinsigamond.

High levels of manganese

Manganese is a naturally occurring mineral that's prevalent in New England. It's found in rocks, soil and groundwater. While it's an essential mineral for proper nutrition, it can be harmful in elevated concentrations.

The U.S. Environmental Protection Agency and the Massachusetts Department of Environmental Protection established an "aesthetics based" secondary maximum contaminant level for manganese of 50 parts per billion. When manganese concentrations exceed the 50 ppb level, it can produce discolored water, which was the case in Shrewsbury, Rowley says.

The town has been dealing with manganese since around 1990. It typically turns drinking water brown or black and can stain clothes and kitchenware. It can also carry an odor and make the water taste bad.

"On the technical side, manganese may build up in pipelines, pressure tanks, water heaters and the like, reducing the effective size of pipes, requiring more frequent replacement and increasing the operation and maintenance costs due to the extra power needed to pump water through smaller pipes," according to a town report.

Chemical solution

To deal with the manganese, the utility started injecting a chemical blend of half polyphosphates and half

orthophosphates into the water system in the 1990s, using a chemical pump at the town's water treatment plant. The phosphates prevent the manganese from oxidizing and keeps it in soluble form.

"That worked for many years, so we didn't have to take action," Rowley says. "But the levels slowly crept up and eventually, it would break off in the pipes, which created significant water quality issues.

"Around 2014 and 2015, we started to receive complaints about discolored water," he adds. "In 2016, we had one water quality report with manganese levels at 500 ppb. So we had to do something to remove the manganese."

Rowley believes the increased manganese levels might have stemmed from using different wells as the town's primary well. A severe drought in 2016 and 2017 also likely raised levels in the groundwater.

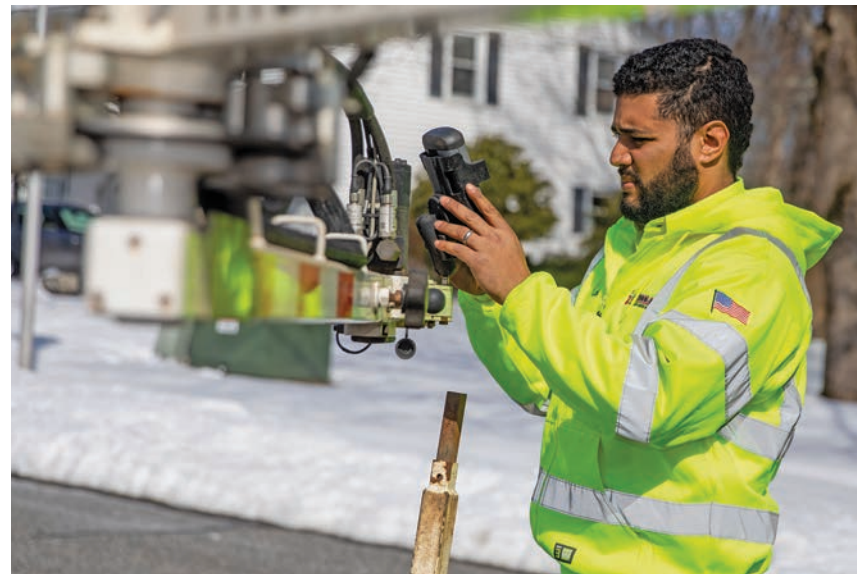
"Droughts can significantly change the pumping level or height of water in a well," Rowley notes. "When a drastic change in the well level occurs, mineral concentrations can change significantly."

New treatment plant

After considering different options, the utility decided to build a \$12

"When a drastic change in the well level occurs, mineral concentrations can change significantly."

Dan Rowley



Top: Jonathan Gonzalez-Rosario exercises a water valve using a Wachs Utilty valve maintenance system in the roadway in Shrewsbury.

Bottom: Joseph Kennedy from the Shrewsbury Water Department watches as Gonzalez-Rosario folds in the boom arm on his work truck after checking the water valve.



Jonathan Gonzalez-Rosario attaches a hose to a fire hydrant before flushing a segment of the water system.

million, 8,580-square-foot water treatment plant equipped with a Mangazur manganese-filtration system. The project was funded by a low-interest loan from a state revolving fund.

“Our existing treatment center (built in 1990) couldn’t accommodate the large filters in the Mangazur system, which are 14 feet in diameter,” Rowley says. “The old treatment plant was primarily designed to remove volatile organic compounds using air scourers and it would’ve been difficult to retrofit it for a Mangazur system. So it was more economically feasible to start with a brand-new design.”

Developed in Europe by SUEZ Water Technologies and Solutions, the system uses a natural biological filtration process instead of chemicals to remove manganese from water.

A key component is naturally occurring bacteria found in raw water. In simplest terms, these microorganisms grow and create a bio-film that coats the giant filters — one in each of four large tanks — and oxidizes (solidifies) the manganese as it passes through. The manganese particles then get trapped in the filters.

Operators backwash the filters periodically to remove the solidified manganese, which flows into decant tanks and then into the town’s sanitary sewer system. The bio-film remains in the filters even after backwashing, allowing for continual operation and no filter replacements needed for long periods of time.

“I’m extremely impressed with the quality of water that the Home Farm Treatment Plant has produced,” says Rich Fox, the assistant superintendent of water treatment pumping stations and a 36-year employee of utility. “And the 700 hours in between filter

“It’s a very visual process. The water might be pretty rusty initially, but then it clears up.”

Dan Rowley

backwashes is unheard of, compared to conventional filtration.”

Construction of the Home Farm Water Treatment Plant began in July 2017. The facility started operating in early October 2018. The project also included refurbishing the eight wells with new pumps, motors and motor-control centers.

The plant can treat up to 7 million gallons of water per day but treats an average of 3.3 to 3.5 mgd. Rowley says operators have to closely watch the pH levels in the water and periodically add oxygen to keep the microorganisms alive.

The utility increased its water rates by 40% in 2018 to cover rising operational costs and to generate revenue to pay off the loan, Rowley says.

More work to do

The project was a success; within several weeks, water samples tested at the plant showed no presence of manganese.

But there was one issue the new treatment plant didn’t solve; the manganese that still coated the waterlines in the town’s water distribution system. That’s where the unidirectional flushing program came into play.

UDF differs from conventional waterline flushing because water flows only in one direction — downstream from a water tank or treatment plant — and the flushing occurs only in one isolated pipe segment at a time. By cutting off other water flows, the velocity of the flushed water, created by opening fire hydrants, increases to 5 to 10 feet per second, compared to 1 to 3 feet per second in conventional flushing, Rowley says.

The Shrewsbury water system has three pressure zones; each one func-



Rusty water pours from the hydrant at the start of the flushing operation. The unidirectional flushing process clears manganese and tuberculation from the distribution system.

The Town of Shrewsbury Water & Sewer Division team includes (from left) Superintendent Dan Rowley, Rich Fox and Joseph Kenney.



tions independently with its own water tanks.

“The town has such elevational differences and we have to have the water system function in line with those different elevations. One area of town is very high, so it has two water tanks.”

Block-by-block flushing

Under the game plan developed by Tata & Howard, the town was divided into 12 sections. A flushing sequence was laid out for each section, block by block, starting at either a water tank or at the treatment plant.

“You’re essentially working away from the source of the water,” Rowley says. “Step by step, the contractor would close off the appropriate valves at an intersection and then open a hydrant, which creates a high-velocity flush in one direction, created by the hydraulic pressure of the system.”

“Opening the hydrants moves an incredible amount of water. It can remove not only the manganese, but tuberculation, too,” he adds. “Then you systematically flush the side streets.”

Mains larger than 12 inches in diameter sometimes required opening a couple hydrants at the same time in order to generate the required velocity. The system has about 1,538 hydrants.

The flushing continues until the water runs clear. That could take as little as five minutes or as long as a couple of hours, Rowley says.

“It’s a very visual process. The water might be pretty rusty initially, but then it clears up.”

The water from the hydrants then drains into the town’s stormwater system.

Residual benefits

There are some side benefits to unidirectional flushing. For starters, the process uses an average of about 40% less water than conventional flushing, experts note.

In addition, removing tuberculation in pipes extends the life of water mains, Rowley says.

“We also found sections of water mains where the gates were closed and we didn’t know about it. And we found that some gates in new subdivisions were buried under pavement, so we dug them up to expose them.”

“It’s also good to open the hydrants and be sure they’re functioning correctly.”

As he looks back on the project, Rowley says he’s appreciative of the support received by the town’s leadership and the patience of the residents and businesses as the work took place. He also praised the entire Department of Public Works staff and Hydra Tech for their tireless efforts in making the project a success, noting it was truly a team effort.

“With close to 20 years of experience in water distribution and treatment, I’ve never been a part of a project of this scale,” adds Joe Kenney, assistant superintendent of water and sewer operations. “The ability to map out and execute a UDF program of this size is an incredible achievement.”

“The ability to map out and execute a UDF program of this size is an incredible achievement.”

Joe Kenney

UDF will continue

Looking ahead, the UDF program will continue indefinitely each spring and fall, taking two to three years to complete a full pass through the town. And because the pipes have already been scoured, the process should go faster and use less water going forward.

Rowley thinks there’s a lesson here for other utilities, starting with proof for UDF doubters.

“If someone doesn’t believe that unidirectional flushing works, our experience proves how effective it really is when done right,” he says. “Water utilities shouldn’t let their flushing programs lag. It’s an easy thing to push off and push off, but it’s really critical for optimizing your system.”

John Samia, chair of the town’s governing board of selectman, which also serves as the town’s water commissioner, says completing the flushing project was an important step for the town of about 38,000 residents.

“Improving water quality has been one of the most important goals for the town over the past several years,” he says. “The completion of the first full pass of all 12 flushing zones represents a significant step toward improved town water quality.”

“This important work will continue and we look forward to even more water-quality improvements upon further rounds of unidirectional flushing zone work and future water quality improvement projects.”

Would Rowley call the program a success? Absolutely, he says.

“When we started the UDF program in 2019, we had a lot of complaints about water quality. And now we have hardly any. So we’re in a much better place than we were a few years ago.” ♦

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OPTIMIZE CLEANING OPERATIONS

Using the correct accessories will improve cleaning performance while minimizing water use

By Del Williams

The right tools are essential for collections system crews facing difficult cleaning challenges and stubborn obstructions. A well-equipped vacuum truck is a big piece of the puzzle, but so is selecting the proper accessories — tools that can take performance to another level and save considerable time, labor and water resources.

Industry expert and consultant on vacuum sewer trucks Matthew Woods, vice president of sales and marketing at Haaker Equipment, says the right accessories are essential to help crews perform more efficiently.

“The value of having the right accessory for the job cannot be overlooked in terms of operating safely, quickly, efficiently and cost-effectively,” he says. Haaker Equipment is a dealer of vacuum sewer trucks, sewer cleaners, pipe inspection equipment and other tools for municipal utilities.

“The pole-mounted camera allows the prioritizing and allocating of resource-intensive inspection and cleaning crews.”

Matthew Woods

Nozzles

As industry professionals understand, jetting nozzles are some of the most important tools on sewer trucks and are used daily to clean sanitary and storm lines. Nozzles direct pressurized water to clear out obstructions such as silt, sludge, grease and mineral buildup as part of required maintenance or to prepare pipes for relining.

Although nozzles with many configurations are used, the industry rates nozzles based on efficiency. Since utilities are always looking for more effective ways to conserve valuable water resources, companies like Haaker recommend purchasing higher efficiency nozzles with every vacuum sewer truck.

“We regularly recommend stepping up to a higher-efficiency nozzle,” Woods says. “The ultra-efficient nozzles play



a key role as freshwater becomes scarcer because the nozzles provide more efficient fluid mechanics to prevent the waste of water and reduce operating pressures.”

“Today, most vacuum trucks are still filled with clean, treated, fluoridated drinking water [from hydrants], which is an increasingly costly resource to put down a sewer line to clean it.”

The most efficient nozzles offer tight water patterns that effectively clean the pipe wall and create a powerful water stream to move debris long distances and propel the nozzle.

“With a more effective high-efficiency nozzle, operators will get better performance and clean more pipe using less water. They will be able to clean more square footage of sewer line with the water available on the truck,” says Woods.

Reducing water also saves costs by eliminating unnecessary extra trips to refill the truck’s water tank and keeps crews effectively on task.

Sewer line cameras

Having a camera or nozzle camera can help operators assess pipe condition without a CCTV truck. A camera is often necessary to not only locate pipe offsets, collapses and infiltration but also avoid obstacles that could trap a nozzle. Video or photo

documentation of before-and-after pipe condition is advantageous to ensure the pipe is completely free of obstructions.

“Without using a camera, sewer truck operators are going into the pipe ‘blind’ and do not know what is down there or what they are cleaning,” says Woods. “It is much easier for crews to clean once they identify what is going on inside the pipe. With this information, the operator can apply the right tool or technique and speed completion of the job.”

According to Woods, a pole-mounted camera can be used to quickly assess sewer lines from an adjoining manhole to determine if they need cleaning, repair or further inspection. A unit with Wi-Fi wireless control and video will eliminate cables and allow live video sharing on multiple devices.

“The pole-mounted camera allows the prioritizing and allocating of resource-intensive inspection and cleaning crews, to keep the operation running smoothly,” says Woods.



Combination jet/vac trucks are a prerequisite for effective sewer cleaning, but the right accessories can significantly improve the speed and quality of cleaning by any work crew, while conserving water.


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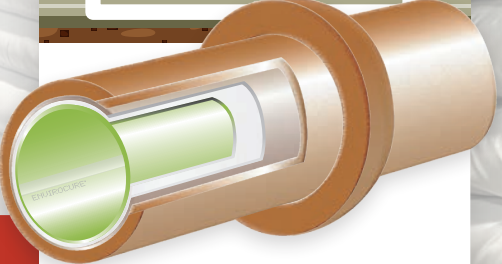
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The most efficient nozzles offer tight water patterns that effectively clean the pipe wall and create a powerful water stream to move debris long distances and propel the nozzle.

To further simplify inspection down the sewer line, camera nozzles provide operators the ability to clean sewer and storm lines while recording video. Self-leveling camera heads, onboard illumination, high-definition



Nozzles, like these models from KEG Technologies, come in many configurations. The key is matching the nozzle to the type of pipe and the specific task at hand.

recording, memory capacity and Wi-Fi downloading are all features worth considering.

“During routine cleaning, the nozzle camera captures video that can show if there are roots in the pipe that should be removed before they even become a problem,” Woods says. “If the roots cannot be removed by the action of the nozzle itself, an operator can go back in later with a chain cutter.”

Chain cutters

Tree roots are often the cause of blockages in sewer and storm lines. Blockages can also occur due to accumulated hard mineral deposits, grease, silt or debris.

When a severe blockage is identified, chain cutter nozzles might be required. Most are hydraulically powered, which reduces the overall cost of the unit, but many supply sufficient power or torque to cut through heavy roots or hard mineral deposits.

Chain cutter nozzles that utilize water pressure, however, are more efficient and can deliver the required torque to cut through thick masses. In this approach, high-pressure water enters the chain cutter nozzle chamber and is directed to spin the cutting chains at high velocity.

Sewer maintenance tools

Another valuable addition to the accessory list is the broader category of general “tools” that simplify tasks and improve efficiency. This includes items such as manhole hooks/picks, telescoping claws, sewer brushes, debris baskets, tubing transition couplers, vac-traps and the like.

“For sewer cleaning and maintenance, there are many special tools and accessories that crews use on a daily basis that facilitate safety and productivity,” Woods says.

The bottom line

The bottom line for collections system crews is that having the right accessories can significantly improve the speed and quality of cleaning by any work crew, while conserving water.

With so much to gain, cleaning crews are advised to spend the time and energy investing in the accessories they need. Those that seek out best-in-class options and use them effectively to complement the vacuum sewer truck itself will enjoy dramatically improved performance and productivity. ♦

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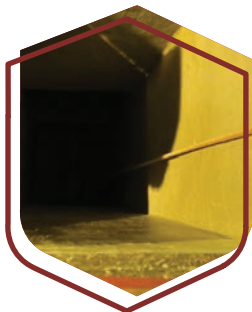
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GETTING COMFORTABLE WITH CANDOR

While truth bombs can hurt, everyone benefits from honest feedback

By Ken Wysocky

In the corporate world, it's so much easier for managers to gloss over employees' weaknesses or for employees to give some manager's zany proposal a free pass, no questions asked. Just go with the flow and it's all good.

Until it's not.

Here's the thing: When managers don't give employees the critical intel they need to get better, they're tacitly indicating that underperformance is OK. That then places an unfair burden on high-performing employees who pick up the slack. And that, in turn, leads to resentment and low morale, poor team results and higher turnover as star employees tire of the charade.

The same is true for a group-think mentality where no one raises questions about proposals and projects. There are many reasons for this. One obvious factor is concern about retaliation. Or employees are afraid they'll be the only one to say something — even if they know others share their skepticism. Or perhaps they lack the confidence or conviction to express an opinion, fearing it's without merit.

How can you tell if an organization cultivates a culture of fear instead of candor? The telltale signs are obvious, says Dana Brownlee, the founder of Professionalism Matters.

You probably know the drill: There's the "meeting after the meeting," where employees who smiled and nodded their approval as the boss announced another doozy of an idea then gather in a break room and whisper about the ridiculous proposal.

"Or you're attending a large, all-hands meeting and the president of the company asks if anyone has questions about a new proposal, and no one raises their hand," she adds. "If you have that many people in a room and you have zero questions, you're working in an organization with low trust."

Worse yet, it convinces leaders that bad ideas are viable, she says.



“It’s a simple idea — care personally while at the same time you challenge directly.”

Kim Scott

It's all about context

While honesty truly is the best policy, it also can have negative consequences if not presented tactfully and diplomatically. Like so many things in life, it's not what you say, but how you say it, along with the context you provide for your candid comments, experts say.

Best-selling author and executive coach Kim Scott has a name for it: radical candor.

"It's a simple idea — care personally while at the same time you challenge directly," says Scott, the co-founder of Radical Candor, a consulting firm that helps organizations create a culture of effective feedback. "It's like delivering love and truth at the same time.

"Very often we think there's a dichotomy between the two, but I believe that's wrong," continues Scott, the author of the best-selling book, *Radical Candor: Be a Kick-Ass Boss Without Losing Your Humanity*. "If you truly care about someone, you also must challenge them — tell them when they make a mistake."

That raises a crucial point about radical candor: It only works when employees know their

managers care about them. Without that key ingredient, praise sounds insincere, and criticism becomes what Scott calls obnoxious aggression.

The converse to that is when managers care about employees but fear that delivering bad news will hurt their feelings. Scott calls this "ruinous empathy."

But when managers both care about and challenge employees, they've entered the radical candor zone.

Two-way street

So if managers realize they're obnoxiously aggressive, how do they change without making their team members leery about the sudden transformation? Start by first inviting criticism, rather than dishing it out, Scott suggests.

"If you solicit feedback and respond well to it, they see that you view feedback as a gift," she explains. "And going forward, they'll now understand the spirit in which you offer them feedback."

When managers ask for feedback, it's important to ask questions that can't be answered with simple "yes" or "no" answers. For example, managers might start by asking what they can do to make employees' jobs easier.

Moreover, it's important to first give praise for what employees do well. "It's not a complicated process," Scott notes. "After you solicit feedback and give praise, you're in a better frame of mind and the employees are in a better frame of mind and it becomes easier to offer criticism."

Radical candor also requires two-way dialogue, not a monologue. In short, managers must be mindful that they're not the sole arbiters of good or bad performance. Instead, they should emphasize that they're not passing judgement, just sharing a point of view, she recommends.

"It's better to say, 'Here's what I see and I'm curious to understand what you see,'" Scott suggests. "You don't want to sound like you have a

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.

pipeline to God, where you know what's true and what isn't. You're simply trying to find a better answer together. This should be more about listening than talking. Be humble."

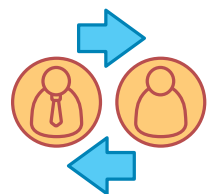
Get permission to criticize

Similar guidelines apply when questioning crazy managerial proposals. For instance, it's a bad idea to just tell someone a proposal is terrible, Brownlee says.

"Instead, tell them it's a good idea, but I'm concerned about x, y and z," she suggests. "Or say, 'I know this is your baby, and I fully support it, but I've heard some rumblings that could raise red flags. Do you want me to bring those up to you or keep it to myself?'"

"It's always good to ask for permission up front, and phrasing concerns as a question is much less threatening."

On a broader level, organizations need to let employees know that candor is a corporate value to be prized, not punished. They should encourage employees to play devil's advocate because it's better than finding problems with projects or products after the fact.



There are ways to make employees feel more comfortable with candor. Brownlee says one manager she's worked with puts \$5 in a jar every time one of his reports pushes back on a new idea. He then uses the money to fund a once-

a-month pizza party.

Managers also can pick a rotating devil's advocate that's responsible for raising tough questions during meetings.

"It might sound silly, but when you do things like that, it starts to shift the culture," she explains. "You take away the fear factor and pressure for people who don't want to push back because for that one person, it's their assigned job."

Brownlee also suggests a tactic she used back when she was a team leader and project manager for a major telecommunications company. When she'd hold meetings to announce new initiatives, she'd place an index card on every chair in the room. On the card was written, 'My biggest concern about this project's success is _____.'

When the presentation concluded, she'd ask employees to anonymously fill in the blank and drop the card in a bag as they left.

"This technique gave me tons of candid feedback," she explains.

Start small, but aim big

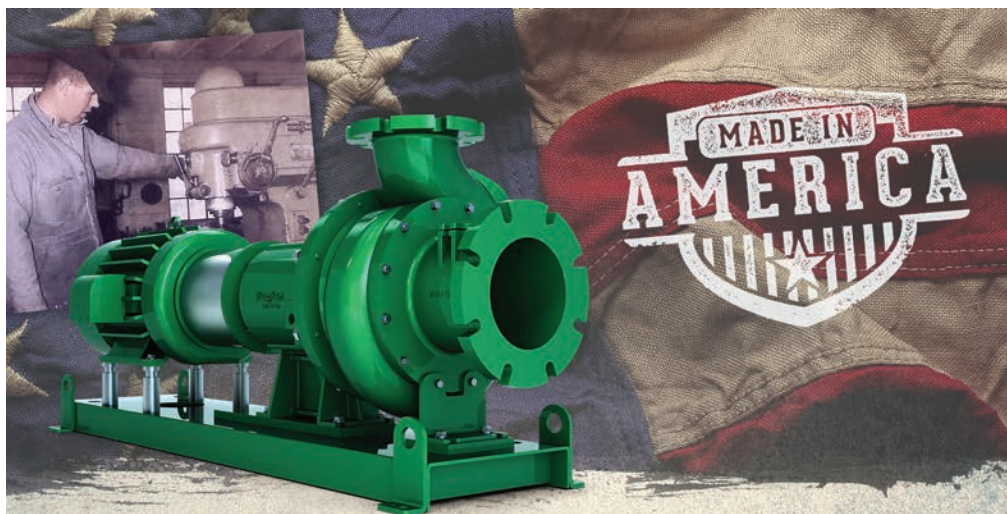
In the end, changing an organization's culture

can be a lot like turning around an aircraft carrier: It takes time. And it's the little things that matter, Brownlee says.

"There's no real formula for changing it," she notes. "It takes a lot of role modeling by managers. It's the small things you do at the granular level that change the paradigms." ♦

"It's always good to ask for permission up front, and phrasing concerns as a question is much less threatening."

Dana Brownlee



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PREDICTING FUTURE SUPPLY

Research aims to model climate's impact on water resources

By *Tim Dobbins*

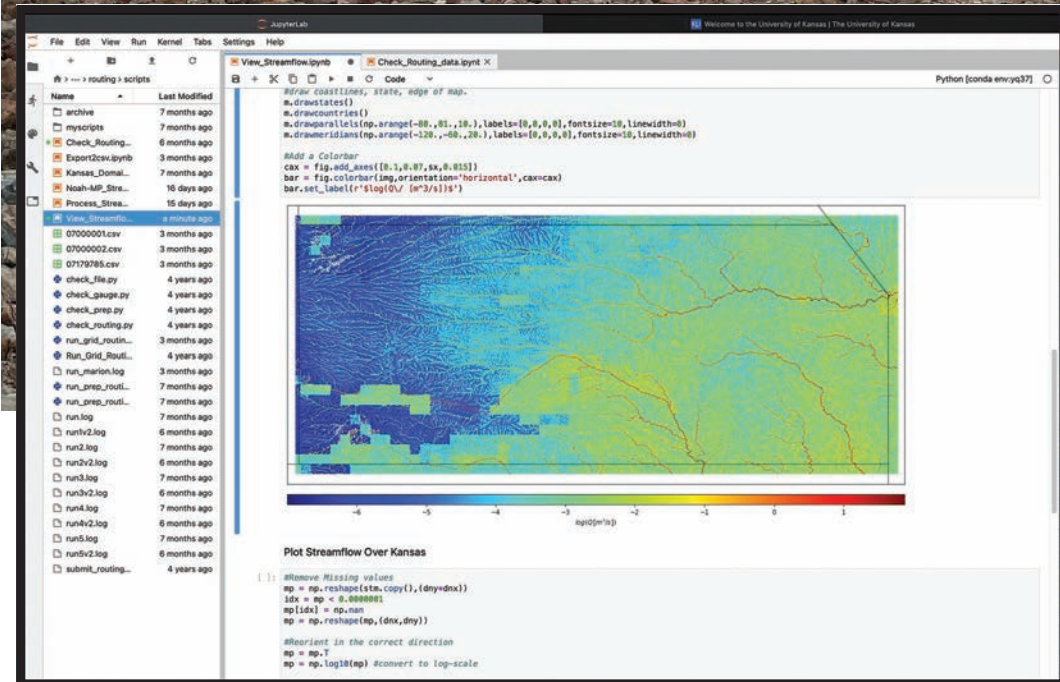
Researchers at the University of Kansas School of Engineering are set to begin a two-year project aimed at creating models using projected climates to help state officials better allocate water.

The idea came a few years ago when Josh Roundy, associate professor of civil, environmental and architectural engineering at KU, met with a representative from the Kansas Water Office and together realized the need for more in-depth models depicting water availability in different climate scenarios.

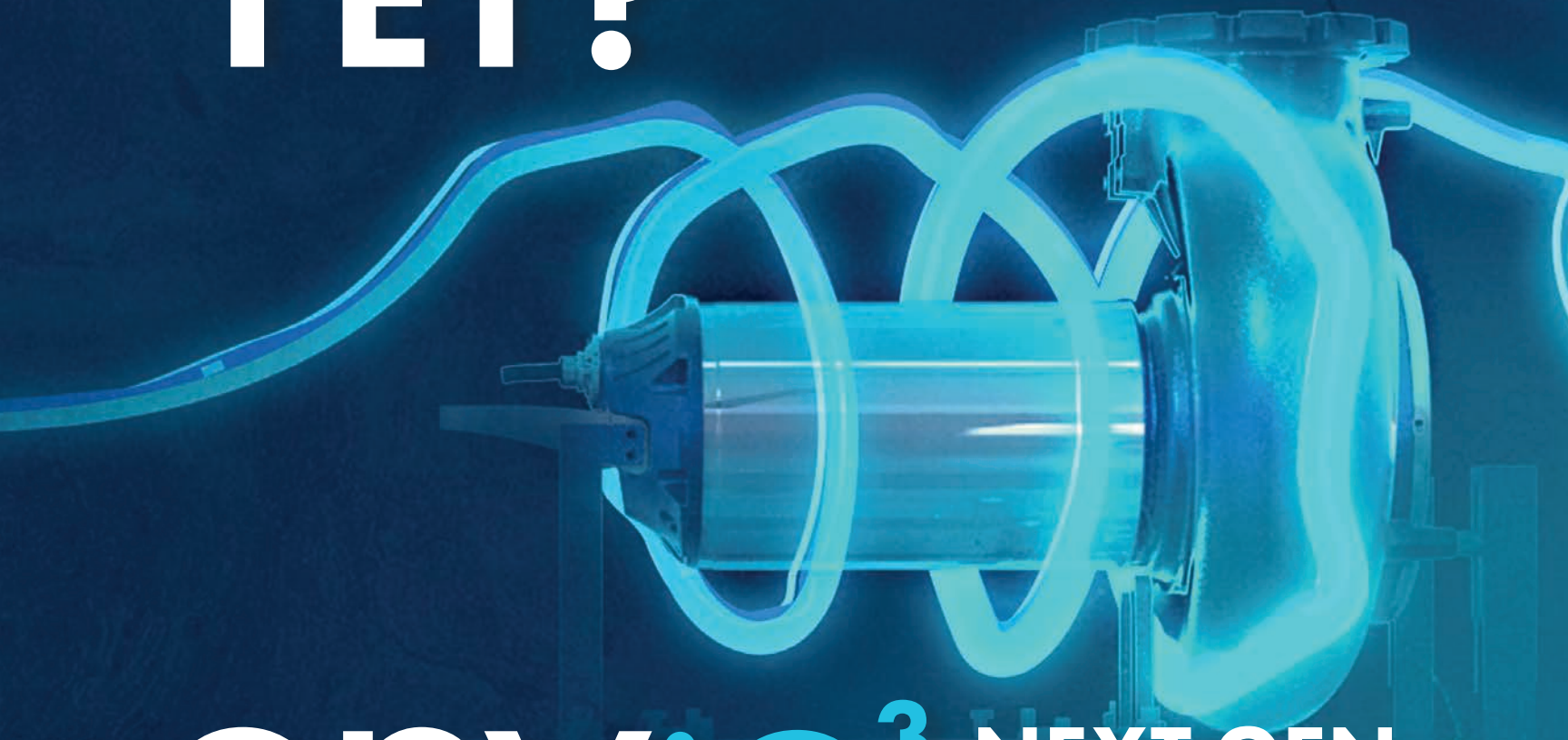
A proposal was drawn up and eventually chosen to receive funding from the Bureau of Reclamation's WaterSMART grant with additional funds from KU and the KWO.

The proposed research will expand the models currently used by the KWO that are largely based on data recorded during a 1950s drought. Roundy thinks the outcome of this project will make it possible for officials to consider different scenarios besides drought by looking forward to climate predictions and their direct impact on evaporation and streamflow. The proposed project will do just that and ultimately help with future water allocation decisions in Kansas.

(continued)



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“Because of my degree in civil engineering, I’m very interested in working with people and infrastructure,” Roundy says. “I want to make the data that we work on as climatologists useful in terms of making better decisions. That’s always been the motivation for why I do what I do.”

Scope

The project is localized to the central and eastern portions of Kansas and incorporates six river basins, 21 reservoirs, 51 inflows and 163 sources of consumptive water use. The team, led by Roundy, will use the Couple Model Intercomparison Project Phase 5 from the World Climate Research Programme to forecast how climate changes will impact rainfall and water availability in upcoming years. These models compare multiple emission scenarios along with responses from the land, ocean and atmosphere.

“We’re going to be taking down-scaled climate scenarios, which the Bureau of Reclamation has already done for all of the U.S., and using those, we will be running a model that is going to calculate stream flow and evaporation,” Roundy says. “So, we will model what that type of data looks like under different climate scenarios. The challenge is then to be able to validate that our hydrologic model that we’re using is giving us useable results.”

Roundy says they will spend a lot of time validating, calibrating and checking the values they get from the hydrologic models compared to those observed in the past.

Though this work will focus on Kansas specifically, the strategy used and the ending results may benefit municipalities across the country. “More broadly speaking, I think municipalities will be more inspired to actually take on using climate data in different scenarios and use that in their planning and maybe not be so intimidated by it,” Roundy says.

That part of the project is important. Compiling data into models is only useful for the KWO and other utilities if it’s in a form and presented

in a way that is easily understood. “The whole idea behind this is that we can come up with ways to do that processing and put it in a way that’s simple for the Kansas Water Office to put in their model. To remove that technical barrier, so more people can use that data.”

“I want to make the data that we work on as climatologists useful in terms of making better decisions.”

Josh Roundy

Broader reach

It’s Roundy’s goal that the project will result in a published academic paper showing other states and regions an approach for forecasting future water supplies, providing an extra tool to scheme and adjust future water distribution plans.

Another challenge for Roundy and his team is the fact that their research is dependent on a very unpredictable field of data. “Climate data is

very uncertain. We are trying to form this uncertainty in a way that can still be very useful,” Roundy says. What he means is that even though their estimates might not be completely accurate, the work could still offer a level of risk assessment for water supply; it just comes down to displaying it in the right way.

Managing water supplies may become more and more challenging in upcoming years as increased periods of drought are projected as well as periods of increased flooding. Generating scenarios based off climate changes like more frequent droughts and flooding and how the seasonality may change are the types of models that could exponentially help local authorities make educated decisions moving forward.

“I think there are a lot of applications for climate scenario data,” Roundy says. “The ultimate goal is to help make water allocation more sustainable long term and to help the Kansas Water Office make good decisions about allocation into the future while encouraging conservation and being all around smarter with our water.” ♦

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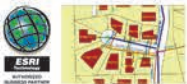
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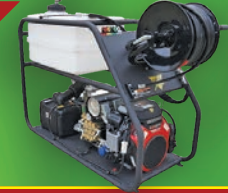


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GROWING WITH THE COMMUNITY

Operational improvements and a collaborative approach drive Westminster's quest for distribution system optimization

By Andrea Song

The city of Westminster, Colorado, is a vibrant, growing city along the Denver-Boulder corridor. Like many cities across the country, Westminster is faced with managing aging distribution infrastructure.

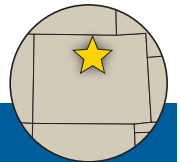
The challenges of aging infrastructure require innovative approaches to becoming a more reliable and efficient service provider while making the most of existing infrastructure, and doing so as cost-effectively as possible. Replacing infrastructure with new assets is not always fiscally or operationally feasible.

The distribution system includes approximately 550 miles of waterlines, 15,955 isolation valves, 4,840 hydrant valves, and 10 pressure zones. The city also has 10 storage tanks with a total storage capacity of 31 million gallons.

Westminster's primary source of water is Standley Lake, and its potable water demand ranges from 10 mgd in the winter to 44 mgd in the summer. The city has two drinking water treatment facilities. The Semper plant has a rated capacity of 44 mgd and the Northwest plant has a rated capacity of 15 mgd.

To become a more reliable and efficient service provider, the city has been an active participant in the American Water Works Association's Partnership for Safe Water drinking water optimization program sponsored by AWWA, the U.S. Environmental Protection Agency and other organizations to recognize water suppliers that continuously go above and beyond regulatory requirements to provide high-quality drinking water through treatment plant and distribution system optimization.

Westminster's distribution team has been an active participant since 2017 and received the Phase III Directors



PROFILE:

Westminster (Colorado) Water Utilities

SERVICE AREA:
34 square miles

WATER DISTRIBUTION EMPLOYEES:
35

WATER CUSTOMERS:
34,000 meters serving 125,000 residents and residents of neighboring community Federal Heights

MILES OF WATER MAIN:
550 miles

NUMBER OF FIRE HYDRANTS:
4,840

SUMMERTIME PEAK DEMAND:
44 mgd

WEBSITE:
[www.cityofwestminster.us/
publicworksupilities](http://www.cityofwestminster.us/publicworksupilities)

Westminster (Colorado) utilities specialist Preston Geib checks water pressure with a backflow hydro construction meter on a local hydrant. (Photography by by Cara LeFebvre)

Award for the Distribution System Optimization Program in 2018. The team is currently working toward becoming one of the very few utilities in the country to achieve the Phase IV Presidents Award, which is an important milestone in continuous distribution system performance and operational improvement.

Culture of empowerment

Maintaining existing infrastructure may begin with equipment and materials, but it's also about empowering people. Over the past 70 years, the city has taken successive steps to provide a reliable and safe water supply, manage growth and adapt to changing needs by developing a culture of teamwork among the city's public works and utilities staff. That culture is essential in attracting and retaining great employees.

The distribution team is known for fostering a caring, team-oriented working environment with a commitment to excellence. Westminster's work culture encourages innovation and creativity. The clear goal is to provide core services and foster economic resilience to give their community the opportunity to thrive.

Asset management

The city has been actively addressing water main breaks and overall distribution system health through a proactive water main replacement program. The distribution construction team, established in 1985, currently replaces 2 to 3 miles of primarily residential mains per year. This main replacement program was accelerated in the early 2000s to counteract increasing break rates within the distribution system. The program has been successful, with break rates steadily dropping from approximately 33 water main failures per 100 miles of pipe in 1996 to around seven failures per 100 miles in 2021.

"The in-house construction team has proven to be very nimble and helps save costs when needed," says Water Distribution Superintendent Roger Harshman.

A few years ago, the city planned to remove several pressure reducing valves and vaults at an estimated cost of \$350,000 to \$400,000. Instead of contracting the project out, the construction team was deployed and they completed the project at a fraction of the cost.

"Not only do we replace water mains, we help our meter team rebuild meters, along with replacing vaults and valves," says distribution construction team foreman Matt Bueno, who has worked in the utility for 17 years.

In 2014, the city hired a consultant to conduct an analysis aimed at optimizing and prioritizing water main rehabilitation and replacement. "This project has allowed appropriate prioritization of work, and it has given a schedule and road-map for the city to replace top priority water mains at the right responsible moment," Harshman says. "We are focusing on the pipes with the highest risk condition score or on stretches of pipe that have broken several times."

In 2018, Westminster implemented the Cityworks asset management platform to help focus maintenance and capital spending on priority assets and areas. The distribution maintenance team is responsible for a variety of specialized work activities from valve maintenance and inspections to hydrant repair and flushing. The team is able to enter data in their trucks and make important decisions in real time by accessing Cityworks on their tablets.

"Cityworks is a powerful tool our team uses to leverage information to make informed decisions about whether to repair, renew, replace or allow assets to run to failure," Harshman says. "They are staying on top of things through state-of-the-art technology and in-house skills, which allow more data-driven decisions to be made."

"The in-house construction team has proven to be very nimble and helps save costs when needed."

Roger Harshman



Utilities operators Nick Craig (left) and Trueman Sanchez exercise a water main valve with a Wachs Valve Maintenance System.

Better metering

Gone are the days of customers waiting two months for a bill to find high water usage or waiting for city staff to drive to homes and read customers' meters or check for leaks. From 1992 to 2020, the department relied on a drive-by automatic meter reading system that was a big step up from reading each meter individually. "It took one person 10 days a month to read all the meters," says Brad Bettale, meter shop and cross-connection control foreman.

Westminster recently invested \$14 million in new advanced metering infrastructure to replace over 30,000 residential and small commercial water meters. The new meters have reduced maintenance costs and improved customer service by giving customers more timely information about their water usage, including automatic leak notifications. These leak notices allow customers to find and fix leaks before they receive a high bill. By replacing outdated meters, the city also reduced labor and equipment costs associated with meter reading and maintenance.

OPTIMIZING LEAK DETECTION, PRESSURE MONITORING AND VALVE MAINTENANCE

For the city of Westminster, Colorado, the most common approach to asset management was once reactive. When something would break or malfunction, a repair crew was dispatched to make repairs.

While emergency repairs are unavoidable, the city is now focused on preventive maintenance and solving problems before they arise. “Optimizing leak detection, pressure monitoring and valve maintenance has changed our maintenance program from reactive to more proactive,” says Mark Uhland, distribution maintenance team foreman.

To be more proactive, the city purchased a Gutermann leak detection system approximately seven years ago. “The fact we are seeing more leaks is partly from just being able to detect them,” Uhland says. “But that’s a good thing. It lets us be proactive. If we didn’t detect them, the number of complete main break failures compared to small leaks would increase.”

Other improvements include the installation of pressure surge tanks at three pump stations along with variable frequency drive motors on the pumps. Additionally, the city installed 100 pressure sensors across the system’s 10 pressure zones and has implemented a comprehensive water pressure monitoring program. By tracking pressure and unexpected changes in water flow, which can cause a high- or low-pressure event, the distribution team is supplied with actionable information to minimize service disruptions and decrease emergency repair costs. Planned maintenance is always less expensive than emergency repairs.

Constant pressure readings have led to the replacement of valves that otherwise would have been left in place and failed. “We found an unknown 4-inch pressure reducing valve that needed to be removed as it was a potential hazard,” Uhland says.

By keeping a more constant eye on system pressures, the city has minimized high-pressure occurrences, which put a strain on aging infrastructure and lead to water main cracks, leaks and breaks.

Nick Craig lowers a Gutermann Zonescan 820 Logger into a valve box.



“The willingness to learn also comes with a willingness of staff to take responsibility for the system’s performance.”

Roger Harshman

“Switching over more recently to an advanced metering infrastructure, we have increased the efficiency of the process, simplified the data collection work and saved staff time,” Bettale says.

One utility

The city’s public works and utilities department is comprised of four divisions (utilities operations, streets operations, water resource and quality, and utilities engineering) and the business operations group that maintain and enhance the safety and well-being of the community by providing water and wastewater service as well as maintaining the extensive network of street infrastructure. Westminster’s public works and utilities department adopts a “one utility” ethos that fosters collaborative planning between teams.

The utilities operations division operates and maintains the city’s waterlines, 25 miles of reclaimed waterlines, 23 miles of raw waterlines,

420 miles of sanitary sewer lines, 10 water storage facilities, two water treatment facilities, one reclaimed water treatment facility and one wastewater treatment facility. The operations division coordinates water and sewer system improvement projects and programs. It also administers the maintenance/asset management program that provides the public works and utilities department the resources needed to effectively maintain the many assets customers use on a daily basis.

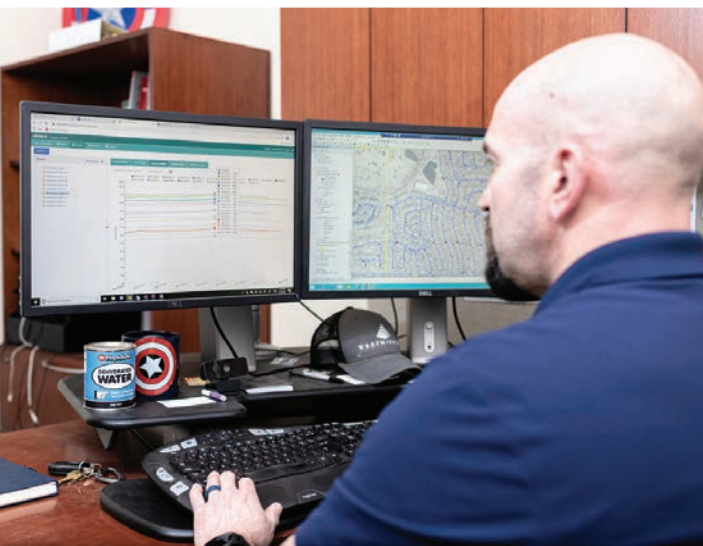
The utility operations division, which includes the water distribution and wastewater collections teams, works closely with the streets operations division to coordinate street surface and subsurface construction work, such as waterline replacement, to maximize efficiencies and lower maintenance costs. The streets operations division provides overall maintenance of streets, manages annual street improvement projects, traffic control devices, stormwater drainage, street sweeping, and snow and ice control.

“They have a lot of streets they need to rehab and we work efficiently to coordinate fixing waterlines on the streets they work on. So, we prioritize and determine which lines we should focus on,” Bueno says.

Both the streets division and the utilities operations division work together to take into consideration the most critical needs of the dis-



The Westminster Water Utilities team includes (from left) distribution maintenance foreman Mark Uhland, meter shop cross connection control foreman Brad Bettale, Water Distribution Superintendent Roger Harshman and distribution construction foreman Matt Bueno.



Distribution maintenance foreman Mark Uhland remotely analyzes data using the Xylem Sensus Pressure Profile software.

tribution team in planning its work schedule.

“The collaboration is great. They’ll shift the scheduling of their street rehabilitation projects around to where we need to do water main repairs,” Bueno says.

Willingness to learn

Westminster’s utilities operations division takes pride in its employees’ education and opportunities to become state-certified water professionals. Harshman credits his team’s commitment to training and staying up to date on the latest industry certifications for their success.

“The city encourages professional society involvement and sends staff to external trainings and conferences,” he says. “The willingness to learn also comes with a willingness of staff to take responsibility for the system’s performance.”

Harshman says managing water distribution today requires a higher skill set, with more instrumentation and controls, data and stringent regulations for system compliance.

When the Colorado Department of Health and

Environment came out with stricter backflow protection requirements, for example, distribution staff provided not only training for internal employees but also educated residents and now verifies certification for cross-connection installers and testers. Cross training is also encouraged throughout the utility’s various teams and helps strengthen the one utility concept.

Response network

The city believes that regional collaboration is a valuable approach for sharing knowledge, technology innovations and helping other utilities respond in times of emergency. Westminster is a part of Colorado’s Water/Wastewater Agency Response Network (CoWARN), which connects utilities to communities during an emergency when water or wastewater services are interrupted by natural or manmade disasters.

When Lyons, Colorado, a small city 35 miles northwest of Westminster, was inundated with a 100-year flood in 2015, Westminster’s water distribution team helped locate waterlines and leaks. When Paonia couldn’t keep water in its tank, two members of the team traveled 230 miles to the western Colorado town to pinpoint leaks using its Gutermann leak detection equipment.

“They thought it would take them two weeks to get it back. We did it in only two days.”

Mark Uhland

More recently, when the Marshall Fire hit the communities of Superior and Louisville, they had to bypass their water treatment plant and send untreated water to fight the fire, which resulted in a boil order. “To bring the system back online, they had to do extensive flushing of the lines,” says Mark Uhland, distribution maintenance team foreman.

Eight Westminster team members joined other community departments in the flushing effort. “They thought it would take them two weeks to get it back. We did it in only two days,” Uhland says.

Helping other communities is part of Westminster’s culture, and Harshman says it’s mutually beneficial. It helps build knowledge, reliability and resilience. “We all talk to other utilities and network and are here for them. It is our responsibility to help others be better. We’re all in this together.” ♦

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PRESENTING POLICY RECOMMENDATIONS

NASSCO's D.C. Fly-In events gaining traction with important members of Congress

By Sheila Joy

For the second year in a row, NASSCO's 2021 Annual Washington, D.C., Fly-In was virtual.

Held over several days, from Dec. 6-17, the 29 meetings included NASSCO members from 15 different states with the following Members of Congress:

- Sen. Mike Braun (R-Indiana), member of the Senate Appropriations Committee
- Sen. Todd Young (R-Indiana), member of the Senate Finance Committee
- Rep. Jackie Walorski (R-Indiana), member of the House Ways & Means Committee
- Rep. Trey Hollingsworth (R-Indiana),

Of the 29 meetings, 22 were with congressional offices that NASSCO has never met with before, or new congressional staffers who were learning about NASSCO's policy recommendations (see below) to Congress for the first time. Additionally, the NASSCO members and staff met with some of the most important congressional offices, including Senate Majority Whip Dick Durbin (D-Illinois), House Majority Leader Steny Hoyer (D-Maryland), Senate Appropriations Committee Vice Chair Patty Murray (D-Washington), Senate Republican Policy Chairman Roy Blunt (R-Missouri), Senate Democratic Conference Chair Tammy Baldwin (D-Wisconsin) and Senate Infrastructure Subcommittee Chairman Ben Cardin (D-Maryland).

The goal of these meetings was to inform and educate members of Congress on the need to fund underground infrastructure and share NASSCO's 2021 Policy Recommendations:

- Provide in the FY22 Omnibus bill the fully authorized funding levels from the recently passed infrastructure package for the Clean Water State Revolving Fund (\$2.4B in FY22), EPA Sewer Overflow & Storm-

water Reuse Municipal Grants (\$280M in FY22), Water Infrastructure Finance and Innovation Act (\$50M in FY22) and Connection to Publicly Owned Treatment Works Grants (\$40M in FY22).

- Fund the EPA Section 106, Section 319, and Office of Enforcement and Compliance Assurance at the highest possible levels in FY22.
- Request the GOA to complete a report to Congress on the state of the nation's wastewater and stormwater collections and conveyance infrastructure.
- Require recipients of federal water infrastructure funding to have an asset management plan developed by certified inspectors using a standardized infrastructure assessment method.

The Infrastructure Investment & Jobs Act, also known as the bipartisan infrastructure package, that passed Congress in November 2021 includes authorization for over \$29 billion in wastewater and stormwater infrastructure funding. Of that amount, \$12.7 billion is guaranteed, with the remaining amount needing to be included in the annual appropriations bills over the next five years.

It is critical for NASSCO and its members to continue to be a strong voice for increased funding for buried water infrastructure. In addition to the Fly-In, in 2021 NASSCO's members used the "Sewer System Heroes" grassroots advocacy webpage to send over 576 letters to Congress calling for increased funding for water infrastructure.

Whether you are a NASSCO member or not, we invite you to call upon your members of Congress by using NASSCO's simple tool. Just text "PIPE" to 25994 or visit www.nassco.org/advocacy/government-relations to participate and for more information. ♦



NASSCO is located at 5285 Westview Drive, Suite #202, Frederick, MD 21703; 410-442-7473; www.nassco.org

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

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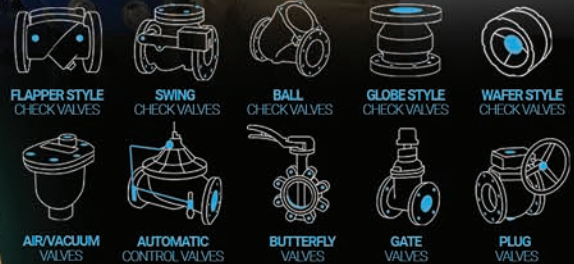
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PUMPS, LIFT STATIONS AND CONVEYANCE

By Craig Mandli

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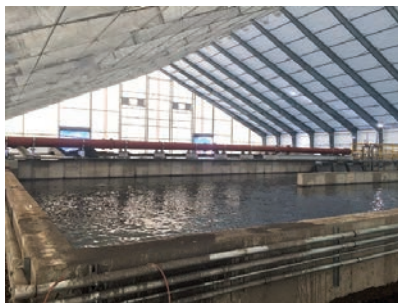
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Crane Pumps & Systems Barnes RAZOR

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epoxy in the conduit. Unlike nonclog pumps with large discharge sizes, its 1.25-inch discharge is suitable for preconfigured packaged systems and turn-key solutions. It is available in the Barnes EcoTRAN Pressure Sewer System, allowing superior waste grinding in tough terrain. It provides a practical and environmentally safe alternative to traditional gravity systems, according to the maker. Numerous configuration options are available. **937-778-8947; www.cranepumps.com**

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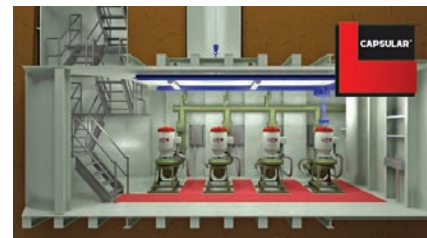
Liberty Pumps ProVore

The **ProVore** grinder from **Liberty Pumps** is designed for use in applications where the addition of a bathroom or other fixtures below sewer lines requires pumping. It has the same V-Slice cutter technology used in the Omnivore Series. Powered by a 1 hp motor, this smaller grinder is designed to operate on a standard 115- or 230-volt circuit, requiring only a 20-amp breaker. No special wiring is needed. The pump comes with a 2-inch vertical-style discharge and a standard leg pattern matching the LE Series. This allows for an easy retrofit into existing systems. Compact factory-assembled systems are available in simplex and duplex versions: the ProVore 380 and ProVore 680. **800-543-2550; www.libertypumps.com**



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Golden Jet Radial RotoJet
RGS Nozzle (Type 01.100A/L5)



Surge relief angle valves prevent surge damage on lift station

Problem:

New freeway construction required an existing lift station to be relocated in the city of Phoenix. The new location was in a hilly part of town with some significant elevation changes that could potentially cause a damaging surge event.

Solution:

APCO brand **SRA surge relief angle valves** from **DeZURIK** were installed on the lift station to prevent line damage from surges that occur when the lift station pumps cycle on and off. The valve is an elbow body-style surge relief valve that is held normally closed by a compression spring or system of nested springs. These valves are designed to prevent damage from water hammer in the system by opening when the system pressure exceeds the set shut-off pressure of the valve disc. As the disc opens, the surge pressure rise that caused it to open is spilled and dissipated through the open valve. When system pressure drops below the set shut-off pressure, the valve disc slowly closes against the oil contained in the cushion cham-



ber and cylinder. The valves are designed with a smooth flow and minimal obstruction to flow for efficient surge relief. The surge valves at this lift station were installed and set to relieve system pressure at 135 psig.

RESULT:

The lift station now discharges into a force main system. DeZURIK PEC eccentric plug valves are used as isolation valves on the lines. The valves continue to perform as designed. **320-259-2000; www.dezurik.com**

Flushed wipes plague high-rise until pump system saves the day

Problem:

A 23-story, 320-unit Austin, Texas, high-rise residence building with a grocery store and restaurant experienced frequent pump clogs, with six faults in two months. The primary culprit: not so “flushable” wipes. The building management team needed a solution. Despite multiple notifications to the building occupants, the team had no control over what was being flushed, clogs persisted and pump service charges were piling up.

Solution:

Installing an **OverWatch Direct In-Line** pump system from **Industrial Flow Solutions** saved the day by eliminating the wet well entirely. Now, wipes and fats, oils and grease are no longer a problem because influent is lifted directly from the gravity invert and they don’t have the opportunity

Did you know that mechanical seals cost the same as applied seals but last 3.5 times longer?

The American Society of Civil Engineers (ASCE) reported a mechanical seal and an applied seal cost about the same, but mechanical manhole frame-chimney seals will last 3.5 times longer.* Contact a Cretex representative to learn more about the LSS Internal Chimney Seal advantages for new construction and rehabilitation projects.



* Data provided by the ASCE Manuals and Reports on Engineering Practice No. 92, "Manhole Inspection and Rehabilitation", 2008 Update.



800-345-3764
info@cretexseals.com www.cretexseals.com

to separate and solidify. Fibrous materials are contained in solution and ejected from the system before solidifying. Since the influent is also contained, it never becomes atmospheric, which eliminates odors and dangerous gases.



The system also prevents grease buildup on basin walls that can cause leaching into the adjacent soil or groundwater.

RESULT:

This technology not only eliminates the wet well, but also eliminates clogs, odors, gases and maintenance. The building management team is saving time and money with this installation. **860-631-3618; www.flowsolutions.com**

Combining radio and wireless broadband provides city with reliable SCADA system

Problem:

The Public Works and Utilities Department of Duluth, Minnesota, manages all aspects of the drinking water, sanitary sewers and natural gas for the city and some of the surrounding communities. The department and city leaders realized that much of the SCADA infrastructure that the citizens relied on for these services had significantly aged and needed to be updated.

Solution:

PRIMEX was selected as the contractor and integrator to develop and manage all aspects of the rejuvenation of the city's SCADA infrastructure. The biggest issue was that the control equipment for all three entities (wastewater collection, drinking water distribution and natural gas distribution) was obsolete and not in working order. The 2 1/2-year project included control modification to every site, including radio telemetry to connect all remote sites with the central SCADA system running on **Wonderware System Platform** for all three entities. Historically, the topography of Duluth made radio communication a challenge. To solve this problem, PRIMEX developed a combination of radio and wireless broadband to provide redundant systems that ensured reliable communication.



RESULT:

PRIMEX was able to deploy the Wonderware System Platform across all three entities and yet use only one application. Redundant servers and redundant communications links were used to ensure all communications and remote sites operated as desired. PRIMEX has been retained as the SCADA integrator for the city. **844-477-4639; www.primexcontrols.com** ♦

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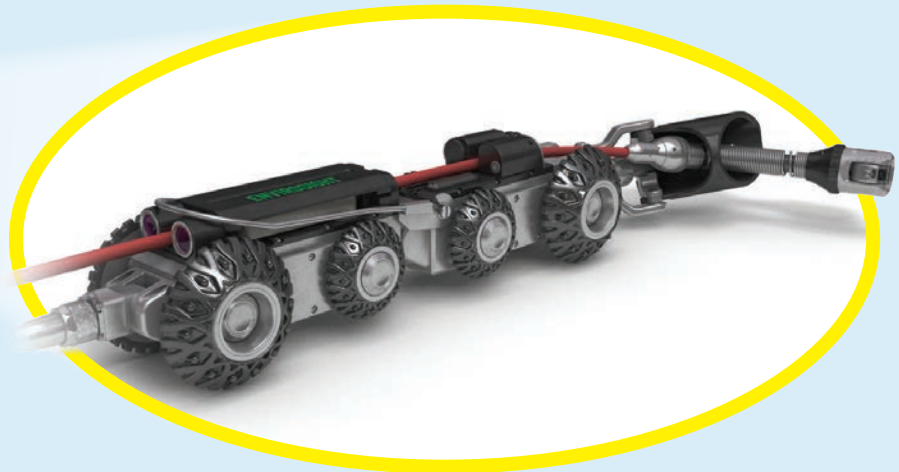
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Product Spotlight

Lateral launch crawler quickly locates cross bores

By Craig Mandli



Locating cross bores can be a long, tedious process without the right equipment. Since there are only so many work hours in the day, the ROVER X SAT II lateral launch inspection crawler from Envirosight is designed to find cross bores and illicit flows with speed and versatility.

Its steerable 8x8 drivetrain reaches crawl speeds of 98 feet per minute with a range of 984 feet, and the camera head launches 147 feet into laterals at up to 23 feet per minute. With quicker inspections, you succeed in accomplishing more per deployment and more per hour. In addition, its new belt drive minimizes pushrod wear and tear and increases uptime and productivity.

“Most lateral launch crawlers use geared or abrasive rollers to propel the launch camera into a lateral. These mechanisms have a habit of wearing dead spots in the pushrod, which diminishes launching power over time,” says Jake Wells, director of marketing for Envirosight. “We devised a drive belt system that delivers excellent pushing force while inflicting little wear on the rod. The implications for reducing downtime and cost-of-ownership are profound.”

The ROVER X SAT II can be maneuvered past mainline obstacles like debris, sludge, roots, offsets and protruding taps. Its wheels can be swapped without tools, and launch tube extensions can be custom-cut

from standard PVC tubes to address challenging lateral geometries. All told, it offers launch capabilities in pipes from 6 to 80 inches in diameter. The crawler’s hinged body bends through vertical accesses as narrow as 12.5 inches in diameter, and locks rigid when not needed. It includes a launch camera with 360-degree pan articulation and +150/-30-degree tilt, a 5-megapixel aiming camera that offers digital pan/tilt/zoom capability for pinpoint launching in any size line, a rear-facing camera to help manage cable during reverse crawl, and other built-in sensors to monitor pressure, inclination and travel distance. Twin sonde transmitters allow accurate location of crawler and launch camera.

“Launching in larger lines is a mechanical challenge,” Wells says. “The crawler’s aiming mechanism has to move with force and precision, and then hold very steady during launch. We really beefed up that mechanism to ensure reliability in these extreme cases.”

The feedback from municipal and contractor customers has been glowing. “They say they have the power and maneuverability to complete more launches, and that the reliability of the system — the push mechanism in particular — helps them avoid downtime,” Wells says. “We’ve also heard that the lack of wear on the pushrod and push mechanism bodes well for substantially reducing maintenance costs.”

866-936-8476; www.envirosight.com

Elastec DrumIt drum-filling vacuum head

Elastec’s DrumIt is a drum-filling vacuum head with an automatic shut-off setup. Simply connect the DrumIt to any vacuum source, such as a vacuum truck, to intercept liquids or solids. DrumIt fills each drum to a consistent level every time. The lid assembly is constructed in stainless steel and fitted with a 3- or 4-inch cam-lock coupling. It is suitable for U.S. standard 55-gallon open-top oil drums with an opening diameter of just under 24 inches. (Oil drum sold separately.)



618-382-2525; www.elastec.com

Mueller Water Products HYMAX Grip for gate valves and hydrants

Mueller Water Products now offers its HYMAX Grip restraint on the 4- to 12-inch A-2361 Mueller Resilient Wedge Gate Valves and Super Centurion 250 fire hydrants. It is a versatile, single-bolt restraint capable of joining a wide selection of pipe types and diameters, resulting in easier, more flexible installations. The factory-assembled grip restraint reduces installation time and effort. Coupled with the A-2361 Mueller RWGV and Super Centurion 250 fire hydrant, the HYMAX Grip restraint helps to drive improvements in planning, efficiency and cost savings within the water network. 800-423-1323; www.muellerwaterproducts.com



SPECIAL REPORT

Patterson Davit Cranes



Give your operations a lift with Patterson Davit Cranes, available in ½-ton and 1-ton capacities. The low maintenance, easy-to-assemble design offers adequate reach to accommodate lifting

large loads within tight spaces, and a boom that can be adjusted to nearly 45 degrees to allow for clearance over obstructions such as handrails. Built for durability, it comes standard with a hot-dipped galvanized finish and stainless steel hardware to prevent rust and corrosion in wet work environments. Following Patterson's tradition of safety-focused innovation, the davit features a reliable brake to keep loads in position without creeping. For over 160 years Patterson has been a trusted supplier of winches, rigging, fittings and custom products for lifting applications. Patterson Davit Cranes are made in the U.S.A. and deliver on the company's promise of helping businesses run safer, easier and faster. Find out how Patterson can improve employee safety and positively impact your bottom line. **800-322-2018; www.pattersonmfg.com/davit-crane**

SPECIAL REPORT

OZ Lifting Products stainless series



OZ Lifting Products' stainless steel range includes chain hoists, trolleys and beam clamps, all designed for use in corrosive environments. The centerpiece of the line is the lightweight stainless steel chain hoist, which helps lift loads with minimal effort but is durable enough for the industry's most demanding applications. The hoists feature fully enclosed gearing; fully machined lift wheel; weatherproof holding brake; roller bearings on all gears and shafts; and forged stainless steel hooks and safety latches. Chain hoists, like the trolleys, are available in 1/2-, 1- and 2-ton capacities. The stainless push beam trolley fits most I, S and W beams and has precision ball bearing trolley wheels. The beam clamps are available in 1- and 2-ton capacities. All products in the line are made from Type 304 stainless steel and come with individual test certificate and serial number. **800-749-1064; www.ozliftingproducts.com**

Hercules Shutout manhole sealant and lubricant

Hercules, a part of the Oatey family of companies, launched Shutout, a non-toxic, universal manhole sealant and lubricant that reduces inflow and makes manhole maintenance easier. Shutout is applied to manhole frames to create a seal, enabling airtight and watertight frames and cover interfaces. It adheres to dry, wet, hot and cold surfaces, offering optimal protection in both freezing and high temperatures. Using Shutout requires no additional training and only takes a couple of minutes to apply, including preparation and cleanup. Applied with a caulking tube, Shutout can be easily transported for use as part of regular operations and maintenance activities. Shutout also makes it easier to open manhole covers, providing lubrication that prevents rust and corrosion between the two metal surfaces, decreasing the force required to open the cover. **800-321-9532; www.oatey.com**



QED Well Wizard ST100 groundwater sampling pump



QED Environmental Systems' Well Wizard ST1000 groundwater sampling pump provides high sample accuracy and reliability of QED's Well

Wizard dedicated bladder pumps in a smaller-diameter format. The sampling device is the heart of every low-flow groundwater monitoring system. The 0.8-inch ST1000 can sample wells as small as 1 inch in diameter at depths over 600 feet, and wells can be sampled at almost unlimited depth with its optional drop tube inlet kit. The pump also fits larger wells with partial obstruction. It has a 316 stainless steel construction and uses QED's exclusive DuraFlex PTFE bladder formulation. The pump has an operating pressure of up to 300 psi. **800-810-9908; www.qedenc.com**

Vac-Con PRO hose reel

The PRO hose reel from Vac-Con offers 16 feet of traversing motion across the front of the machine and 180-degree articulation for 69.6-square-feet of working coverage. With 115% more coverage than the standard Vac-Con articulating hose reel, this flexibility allows operators access to manhole and lift station locations without having to park the unit precisely over the job site. A front-mounted camera system and companion ARC visual screen provides 180 degrees of visibility to the driver in the cab with a generous range to park the unit and still have access to the manhole. Adjustable motions allow for any operator to comfortably use the system. The control panel features four rotational positions, an 8-inch vertical adjustment and an arm rest at the joystick. The PRO Reel can accommodate up to 850 feet of 1-inch hose. **904-284-4200; www.vac-con.com** ♦





Call for Abstracts

Submission Deadline: June 30, 2022

The North American Society for Trenchless Technology (NASTT) is now accepting abstracts for its 2023 No-Dig Show in Portland, OR at the Oregon Convention Center April 30 - May 4, 2023. Prospective authors are invited to submit a 250-word abstract outlining the scope of their paper and the principal points of benefit to the trenchless industry.

The abstracts must be submitted electronically at NASTT's website by June 30, 2022:

nastt.org/no-dig-show



The No-Dig Show is owned by the North American Society for Trenchless Technology (NASTT), a not-for-profit educational and technical society established in 1990 to promote trenchless technology for the public benefit. For more information about NASTT, visit our website at nastt.org.

Virginia Rubber Corp. Founder Harry Ronald Selfe Dies at 86

Harry Ronald Selfe of Clifton, Virginia, founder of Virginia Rubber Corp., died at Arden Courts Memory Care unit Jan. 14, 2022, at the age of 86.

Selfe began his career in the industry as a salesman at Industrial Rubber in Maryland. In June of 1974, he left Industrial Rubber to form Virginia Rubber Corp., selling industrial hose and supplies. Working with two salesmen, he grew the business and interacted with many vendors, creating long-lasting relationships that survive today.

When his son Ron took over in 2007, Selfe came to work daily, attending the pumper trade shows and meeting with vendors. As his memory declined and the business grew, he would still come to work daily, helping out as best he could. Cars and biking were his passions and he spent much of his time with his beloved employees talking about them.

He is survived by his wife Judy, sons Ron and Brian, Brian's wife Andy, and granddaughter Tori.

Reed Manufacturing celebrating 125 years

Erie, Pennsylvania-based Reed Manufacturing is celebrating 125 years in 2022. Carl Reed, along with three partners, started the business in 1896 by manufacturing pipe wrenches and plumbing supplies, and also scales, bicycles and laundry machinery. In 1902 Reuben Wright of Westfield, New York, bought Reed and installed his sons to run the business. His great-great-grandsons Scott, company president and chairman of the board, and Mark, a board member, are still actively involved with Reed today.

Aries awarded Sourcewell contract

Aries Industries was awarded a cooperative purchasing contract by Sourcewell. Sourcewell is a self-sustaining government organization offering a cooperative purchasing program with more than 400 competitively solicited contracts to government, education and nonprofit entities throughout North America.

Aquarius Spectrum to partner with EJP

Israel-based Aquarius Spectrum is expanding its operations in the U.S. with the announcement of a new partnership with Everett J. Prescott. EJP will introduce and deploy Aquarius acoustic water leak detection technology in the 10 states in which they operate, enabling more water utilities to solve water loss challenges caused by hidden background leaks.

Franklin Electric announces recipients for outstanding achievements

At Franklin Electric's annual Commercial Summit — a gathering of team members from across its operations — winners of this year's awards for outstanding performance, sales and customer support were announced. The winners named were Field Salesperson of the Year, Jimmy Vela; Field Service Engineer of the Year, Ryan Horner; and Team of the Year, U.S. South Central Region. The team members, led by Darol Hayes, included Chase Ellsworth, Dave Batdorff, Erasmo Barron, Ilse Gallegos, Jennifer Ford, Jesse Zwiebel, Jimmy Vela, Hannah Kiningham and Woody Kunkel.

Brown and Caldwell appoint Mid-South leader

The environmental engineering and construction firm Brown and Caldwell announced Erin Williams joined the firm as vice president and leader of its Mid-South business. Bringing over 17 years' water engineering design and construction experience, Williams will help municipal and private clients meet challenges related to capital program implementation, infrastructure reliability and effective utility management.



Erin Williams

Clayton County Water Authority wins awards

The Clayton County (Georgia) Water Authority earned the Georgia Association of Water Professionals Consumer Confidence Report Award for Large Surface Water Systems during the association's fall conference in November. Clayton County Water Authority's communications and community relations department won a 2021 Public Relations Society of America - Georgia Chapter Phoenix Award in the Community Relations - Associations/Government/Nonprofit Organizations category for its I'm Invested! CCWA Rate Awareness Campaign. The campaign was a collaboration with Jacobs Engineering.

ADS issues 10-year sustainability goal report

Advanced Drainage Systems announced the release of its 10-year sustainability goals in its newly launched Fiscal 2021 Sustainability Report. The report and goals can be accessed in the sustainability section of the company's website. Highlights of the report include 510 million pounds of recycled plastic used in the company's products; 6% decrease in greenhouse gas emissions; \$4.5 million in capital spent on environmental, health and safety projects; and key partnerships formed with nonprofit organizations that share a commitment to recycling, water and community.

AWWA Board selects president-elect

The American Water Works Association's board of directors selected Patrick Kerr of Baton Rouge, Louisiana, as the association's next president-elect. He was selected during the board's annual winter meeting, which was conducted virtually. Kerr will begin his term as president-elect in June at the conclusion of AWWA's Annual Conference & Exposition, and his term as president begins in June 2023. He follows current president-elect Joseph Jacangelo. Kerr has been a member of AWWA for 28 years and is the chair of the Water Utility Council and an active member of the Southwest Section. He is president and CEO of Baton Rouge Water Works Co. in Louisiana. ♦

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WORTH NOTING

PEOPLE/AWARDS

The **Southeast Michigan Council of Governments** received a \$62,204 grant from the Michigan Department of Environment, Great Lakes and Energy to identify high-priority publicly owned properties based on public input and assess feasibility for green stormwater infrastructure.

The **city of Kenosha** received a Local Award for Excellence from the Wisconsin Association for Floodplain, Stormwater and Coastal Management for its efforts to mitigate major flooding issues.

The **city of Auburn** (Kansas) received \$330,765 in Community Development Block Grants for stormwater street improvements.

Charlotte-Mecklenburg Storm Water Services (North Carolina) received an Excellence in Communications and Green Infrastructure Award from the National Association of Flood and Stormwater Management Agencies.

The **city of Fredericksburg** received a \$3.25 million grant from the Virginia Department of Environmental Quality to aid in improving the city's overall stormwater quality and its effects on the Rappahannock River.

Woolpert promoted **J.P. Johns** to water market director. Johns is a member of the Southeast Stormwater Association and the Florida Stormwater Association.

KPFF Consulting Engineers promoted **Peter Craig** to the role of associate. Stormwater design is among his areas of expertise.

Al Cablay was hired as the director of public works for the city of New Bern (North Carolina). Stormwater inspections is among his specialties. ♦

CALENDAR

May 2-4
Montana Stormwater Association Annual Conference, Holiday Inn Downtown, Missoula. Visit mtstormwaterconference.org.

June 5-8
American Society of Civil Engineers World Environmental and Water Resources Congress, The Hyatt Regency Atlanta Hotel, Atlanta. Visit asce.org.

June 12-15
American Water Works Association ACE22, Henry B. Gonzalez Convention Center, San Antonio. Visit awwa.org.

June 27-29
Water Environment Federation Stormwater Summit, Hyatt Regency, Minneapolis. Visit wef.org.

Aug. 28-31
American Public Works Association Public Works Expo 2022, (hotel TBA), Charlotte, North Carolina. Visit pw.apwa.net.

Aug. 29-31
Smart Water Summit, Hyatt Regency Hill Country Resort & Spa, San Antonio. Visit smartwatersummit.com.

Sept. 11-14
American Water Works Association Water Infrastructure Conference, (hotel TBA), Portland, Oregon. Visit awwa.org.

Sept. 26-28
StormCon and National Rural Water Association WaterPro Conference, Gaylor National Resort and Conference Center, National Harbor, Maryland. These events are being held as parallel conferences. Visit nrwa.org or stormcon.com.

Oct. 24-26
California Stormwater Quality Association Annual Conference, Palm Springs Convention Center, Palm Springs, California. Visit casqa.org.

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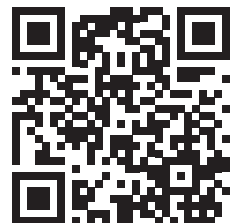
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Features:

- **The revolutionary IntuiTouch® control system**
- **Low-maintenance Jet Rodder® water pump**
- **Exclusive Modul-Flex design**

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VACTOR® 2100i

