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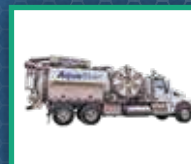
# AN ENVIRONMENTAL MISSION

Liberty Lake district takes  
a hard line on protecting  
local water sources

PAGE 12

Bijay Adams  
Liberty Lake Sewer  
and Water District  
Liberty Lake, Washington

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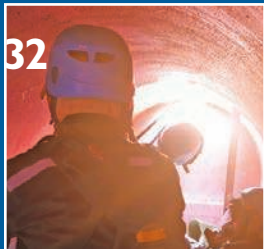
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# INSIDE:

HYDROEXCAVATION AND  
INDUSTRIAL JET/VAC SERVICES



ON THE COVER: General Manager Bijay Adams joined the Liberty Lake Sewer and Water District as lake manager in 2002 and was promoted to his current position six years ago. The district has a crystalline water source underneath the valley floor in its corner of eastern Washington and requires no disinfection. (Photography by Young Kwak)



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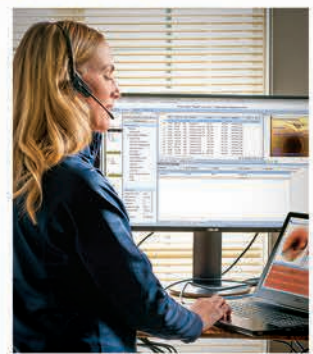




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# AN ANNUAL PILGRIMAGE

Trade shows may not sound exciting, but they're a great way to stay on top of your industry



## FROM THE EDITOR

*Luke Laggis*

Every February I head to Indianapolis for the Water & Wastewater Equipment, Treatment & Transport Show. I didn't spend as much time at the show this year as I usually do, but I still came away with a great appreciation for the industry and the direction our water and wastewater services are headed.

The WWETT Show started 30 years before I joined COLE Publishing, and even though we sold it a few years ago, I still feel a certain sense of pride for the small role I played over my first five years in this position. More than that though, there's a sense of camaraderie at this show that I don't feel at any of the others I attend. That's largely because of you.

I didn't talk to a lot of municipal people at the show, but I know some of you were there. You can't underestimate the value of events like this. You're reading this magazine so I assume you see the value in hearing your peers' stories and keeping up on new and better ways to do your jobs. I respect that.

There is so much equipment aimed at more efficient and effective system cleaning, maintenance, operation and rehabilitation. The strategies and methodologies for even the simplest operational task have evolved so much over the past 10 or 15 years that failing to pay attention and stay current on new developments is doing your utilities and communities a disservice.

The value of attending events like this comes in many forms. For you, it's a chance to meet and talk to your peers, to learn from their experiences and take that knowledge back to your own community. If you've been doing things the same way for years, you undoubtedly have members of your team who know only one way of handling their responsibilities. And what if there's a better way?

Seeing all the new equipment, talking to peers and equipment manufacturers about different processes and taking classes from industry experts can breathe new life into your utility. Sure, it's an expense, but if you or someone from your team comes away with a solution to a problem that's been nagging your system or a way to handle inspections quicker and at less cost, isn't that worth it? On top of all that potential, being exposed to everything trade shows like this have to offer can motivate your people, instilling a sense of pride in the technology and solutions that are driving this industry forward. You can't put a price on that.

If you were there, I hope you came away with some new knowledge and inspiration. If you weren't, I hope you'll look into it and put the wheels in motion to get to WWETT or one of the other shows that are aimed at helping you do your job better.

Enjoy this month's issue. ♦

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

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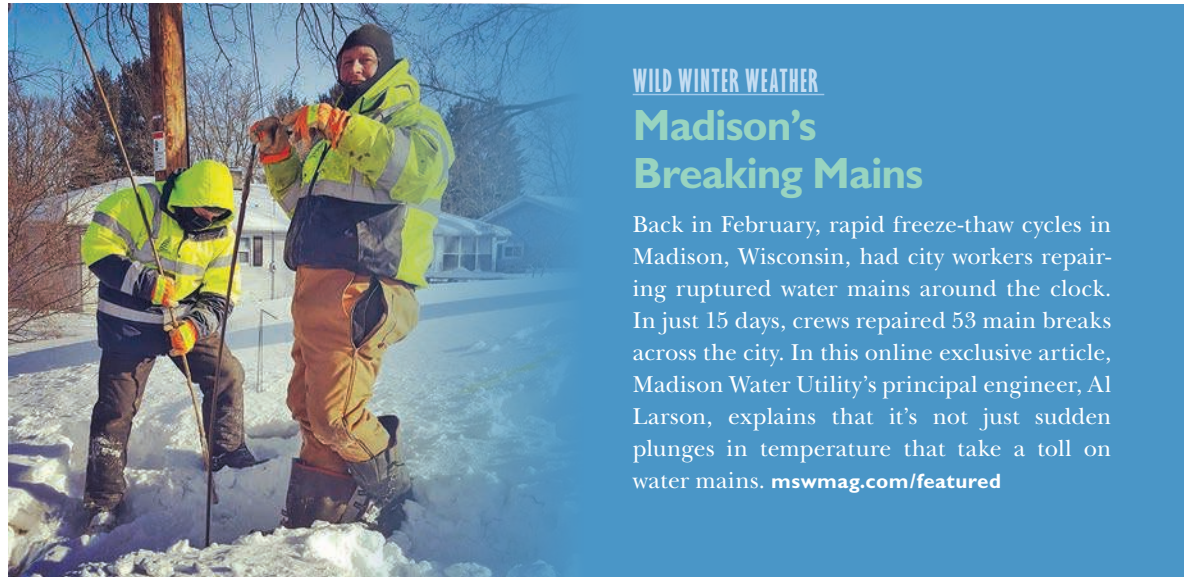
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## OVERHEARD ONLINE

“Even if we quit plastics cold turkey today, we will still deal with this issue for years because plastic never really goes away.”

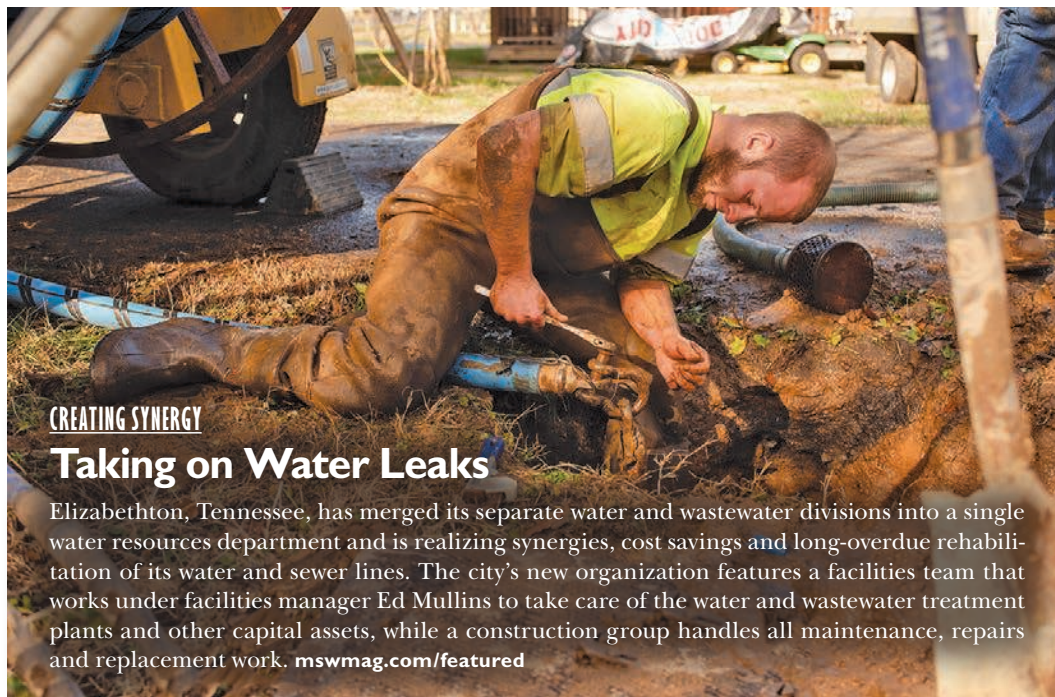
— **Microplastic Contamination Found in Fractured Limestone Aquifers**  
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## WILD WINTER WEATHER

### Madison's Breaking Mains

Back in February, rapid freeze-thaw cycles in Madison, Wisconsin, had city workers repairing ruptured water mains around the clock. In just 15 days, crews repaired 53 main breaks across the city. In this online exclusive article, Madison Water Utility's principal engineer, Al Larson, explains that it's not just sudden plunges in temperature that take a toll on water mains. [mswmag.com/featured](http://mswmag.com/featured)



## CREATING SYNERGY

### Taking on Water Leaks

Elizabethton, Tennessee, has merged its separate water and wastewater divisions into a single water resources department and is realizing synergies, cost savings and long-overdue rehabilitation of its water and sewer lines. The city's new organization features a facilities team that works under facilities manager Ed Mullins to take care of the water and wastewater treatment plants and other capital assets, while a construction group handles all maintenance, repairs and replacement work. [mswmag.com/featured](http://mswmag.com/featured)



## NEW DEGREE PROGRAM

### Addressing Workforce Shortage

The University of Wisconsin-Green Bay recently announced it is offering the UW System's first Bachelor of Science degree in water science. The major will have a principal focus on water's role in natural processes in Earth's systems. Students will develop a solid understanding of the chemistry, surface water hydrology, groundwater and biology of freshwater systems. The program aims to make Wisconsin a world-wide hub for freshwater science to address real-world water issues. [mswmag.com/featured](http://mswmag.com/featured)



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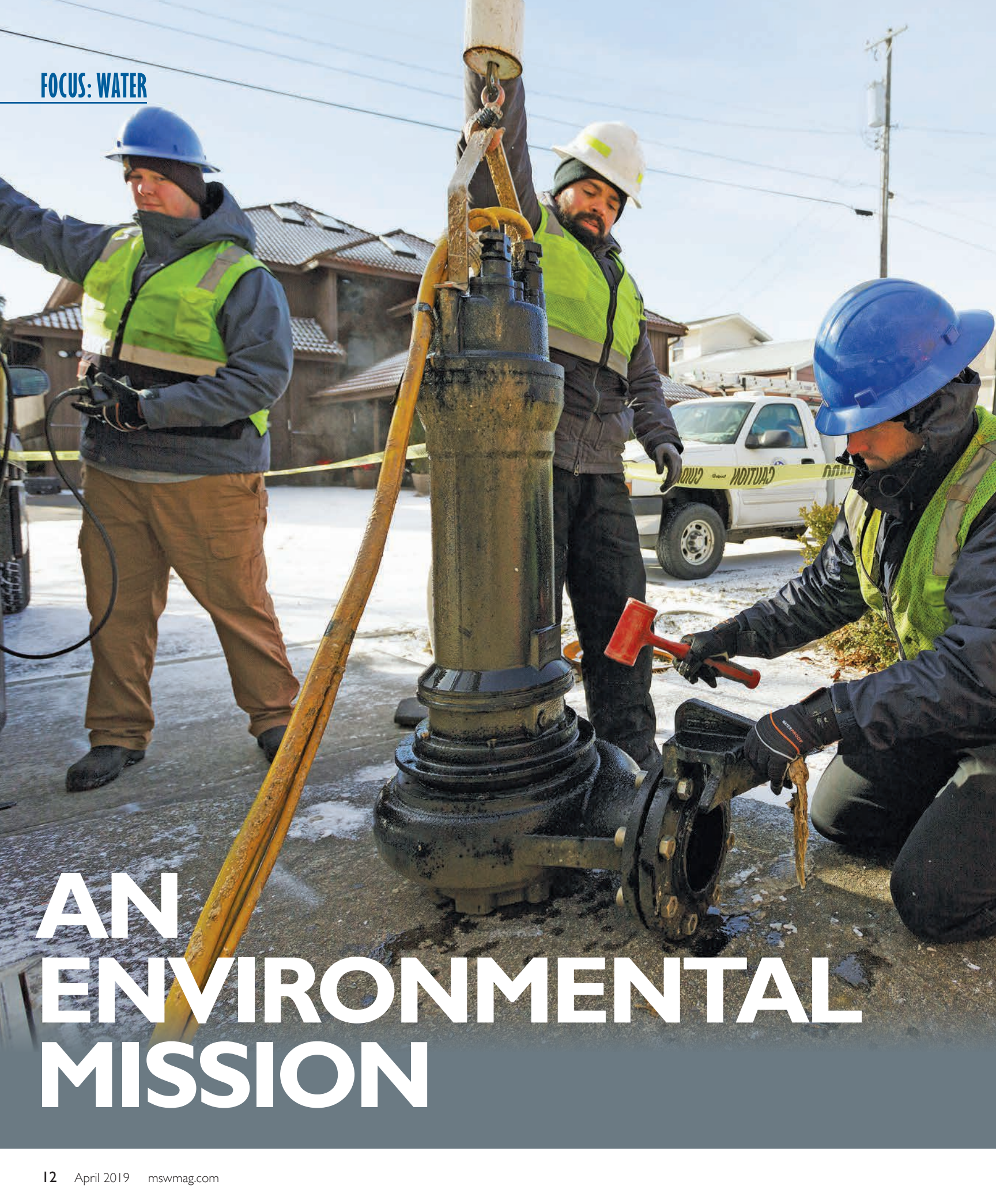


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FOCUS: WATER



# AN ENVIRONMENTAL MISSION



**“Protecting our water is a challenge. And because part of two states share this resource, we have different jurisdictional areas overseeing it and that’s a challenge, too.”**

**Bijay Adams**



## PROFILE:

### Liberty Lake (Washington) Sewer and Water District

#### CUSTOMERS:

4,768 water users, 4,580 sewer connections

#### SERVICE AREA:

5,000 acres

#### WATER VOLUME:

850,000 gpd wastewater treatment (2 mgd plant capacity)  
1.2 billion gallons a year potable water delivered

#### INFRASTRUCTURE:

85 miles of water mains, 5 wells, 8 reservoirs, 7 booster stations, 60 miles of sanitary sewer lines, 14 lift stations

#### EMPLOYEES:

13 (plus 2 meter readers and 1 seasonal employee)

#### WEBSITE:

[www.libertylake.org](http://www.libertylake.org)



**Water reclamation facility chief operator Dan Grogg shows a GE motor control center at the water reclamation facility.**

## Liberty Lake district takes a hard line on protecting local water sources

*By Giles Lambertson*

**W**hen masses of aquatic weeds and floating algae blooms began taking over their town’s namesake lake, the residents of Liberty Lake took action.

The Liberty Lake Sewer and Water District, formed in 1973, is one of 182 special sewer and water districts in the state of Washington. The district has a dual mission: protect local water sources and provide clean water and sewer services.

“Our organization was started as a way to clean up the lake. A large part of what we do is still protection of Liberty Lake. We spend time and resources protecting it,” says Bijay Adams, general manager of the district. “That has the corollary of protecting aesthetic values that have attracted people to the area.”

The 708-acre lake, fed by Liberty Creek, is the most visible component of the district’s environmental mission, with the Spokane River on the north side of the community of Liberty Lake being the next most obvious focus. Yet the principal source of the community’s water lies deep underground: The Spokane Valley-Rathdrum Prairie Aquifer provides drinking water for more than 500,000 people on the

Washington-Idaho border including the 8,000 or so residents of Liberty Lake.

Adams — named for a character in a Louis L’Amour novel — earned a degree in geology and hydrogeology and went to work analyzing lakes and watersheds for the Idaho Department of Environmental Quality. In 2002, he joined the Liberty Lake district as lake manager. Six years ago, he was promoted to general manager.

### Healthy system

The system draws water from five wells and dumps it into eight reservoirs, the largest with a 2-million-gallon capacity. More than a billion gallons of water is delivered each year to some 4,800 customer accounts, mostly residential. The city of Liberty Lake is a bedroom community, situated as it is between Spokane and Coeur d’Alene, Idaho. It also is a retirement community, with three golf courses and, of course, the lake. The community is aptly described as affluent, Adams says.

Industry is light, with call centers, the Itron technology solutions headquarters, Meadowwood Technology campus and a Guardian Angel Homes senior living facility. The biggest commercial customer for the district’s water services is the city of Liberty Lake itself, which irrigates numerous parks and rights-of-way. The district’s sewer service primarily serves single-family and multifamily residences.

In other words, this is not a Rust Belt subur-

**Liberty Lake Sewer and Water District Maintenance Superintendent Derek Nesbitt (right) separates a volute from a HOMA pump as operator Hayden Symbol (center) holds the pump steady and operator Cody Riggs operates a lift at a wet well. (Photography by Young Kwak)**





**Liberty Lake Sewer and Water District water and wastewater operator Hayden Symbol records motor hour run data from a Siemens control panel at a well in Liberty Lake.**

ban community, with aging water and sewer infrastructure and shuttered factories leaching poisons into the ground. Also, because the community has been “booming for the last couple of decades,” district pipelines are relatively new — much of it installed courtesy of developers under the watchful eye of the district.

Yet living in a relatively pristine place brings its own set of challenges for a water and sewer agency. “We do have limited pollution sources. Environmental agencies recognize what we have, but our aquifer always is at risk of pollution,” Adams acknowledges. “PCBs have been a big topic for us. Protecting our water is a challenge. And because part of two states share this resource, we have different jurisdictional areas overseeing it and that’s a challenge, too.”

### Hard line

To guard its water source and minimize pollution events, the district takes a “hard line” on development proposals. A cautionary example is the firm position the district took when a developer

**“In the end, we prevailed and immediately started to improve our relationship with community leaders. We work well together at this time.”**

**BiJay Adams**

proposed building 500 single-family homes on 110 acres, each with one or more ground-source heat pumps. In practical terms, that meant 700 6-inch casings would be sunk some 600 feet into the earth to tap geothermal heat for the residences.

“We obviously were concerned about the aquifer,” Adams says. “We were afraid of some kind of pollution impact. A temperature plume. Migration of bentonite (a drilling sealant) into the water system. A homeowner suspecting a leak in a pipe and saying, ‘I’ll just pour some of this stop-leak from The Home Depot down there.’ So, we took a hard line.”

The developer was not pleased, obviously, and some state officials suggested the district over-

stepped its bounds in staunchly opposing the development — “which we did not,” Adams insists. In the end, the district prevailed and the proposed project was shut down. That the district continues to win water-quality awards might be the real proof of the value of its advocacy.

The district’s 13 employees — including office staff — follow a maintenance schedule that mostly keeps ahead of infrastructure problems. A maintenance superintendent oversees separate water and sewer maintenance programs. When a ductile iron water pipe or PVC sewer line breaks, “It is all hands on deck,” Adams says. Even with relatively new and moderately sized pipes — the largest is 24 inches in diameter — the district still spends more than a million dollars a year on operation and maintenance.

### Sharing the work

Its equipment yard is not jammed with machinery. Instead, the district has cultivated relationships with several contractors who live and work in Liberty Lake. They provide heavy equipment services upon request. “We are fortunate to have so many contractors here. They have been very responsive in working with us. We can get a vac truck or an excavator very quickly when we need it.” Major pipe repair or replacement jobs are contracted out.

On the other hand, more maintenance work is in the offing because, Adams says, some repairs were “deferred because of higher priorities. We procrastinated. Our maintenance program is in a catch-up mode right now.” While that sounds like poor management, it was a case of the district choosing to channel dollars into a major investment in its wastewater treatment plant.

The \$17.3 million phase 2 upgrade of the district’s water reclamation plant is now complete. The facility incorporates physical screening, chemical treatment, tertiary membrane filtration and ultraviolet disinfection systems to eliminate 99 percent of phosphorus entering the plant, creating virtually phosphorus-free effluent. While the water is currently discharged into the Spokane River, the higher-quality product soon may be pumped 15 miles west to the Saltese Flats.

The flats once were a 1,000-acre lake, which was drained in the 1890s to create more farmland and now is being restored by Spokane County. Adams is completing a study that he believes will



show the feasibility of pumping up to 2 million gallons of treated wastewater to the flats per day via a 16-inch main. The plant upgrade was required for reclaimed wastewater use.

### Fair rates

District customers have enjoyed consistently lower rates than the area average, according to Adams, with sewer users paying about \$55 a month and water users \$14. However, in January, while the base water rate increased by a little more than a quarter, sewer rates jumped more than \$5. Adams is not apologetic about it.

"The sewer has gone up because of debt service on the treatment plant loan," he says, referring to a \$15 million state loan. However, he believes the higher rate will soon compare more favorably with surrounding water and sewer systems. "I think we'll find our rate again falling near the rear of the pack. The plant upgrade was mandated, and we are the second of six wastewater utilities to comply. The others are going to have to follow suit in the next three to five years," at which point their rates will also rise.

As a special district, Liberty Lake Sewer and Water has no taxing authority and derives its income from ratepaying customers. It is governed by a board of commissioners and goes the extra mile to strengthen its relationship with its customers, using Facebook, Twitter, direct-mail newsletters and monthly columns by Adams in the local newspaper. "The other way we communicate is in our effort to provide the best possible customer service," Adams says.

The district crosses city and county jurisdictional lines, which can be problematic for a public agency. In 2003, the district's whole structure nearly came undone when community leaders in Liberty Lake attempted to take over the sewer and water district. Over the next three years, things got ugly as the struggle pitted neighbor against neighbor. "It divided the community and cost the city and district about a half million dollars in legal fees," Adams says. "In the end, we prevailed and immediately started to improve our relationship with community leaders. We work well together at this time."

### Consolidating service

More recently, the district has been consolidating its service area. It began by acquiring a water system northeast of the lake that served 350 homes. That system was in the process of borrowing \$940,000 to improve its water resource when Adams approached its leadership with another idea: Join us. "We had the capacity to serve the smaller system, so I suggested they consolidate their system with ours."

To make it work, the character of the approved loan had to be changed from water sourcing to infrastructure improvement and consolidation.

**"We obviously were concerned about the aquifer. We were afraid of some kind of pollution impact."**

**BiJay Adams**

Such a switch in an approved loan was a first for the Washington Department of Health, but it approved the change. The kicker was that because consolidation was involved, the loan would carry just 1 percent interest along with 50 percent forgiveness of the principal.

"Last year, we put that \$940,000 into infra-

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## UNADULTERATED WATER

Liberty Lake Sewer and Water District has a crystalline water source underneath the valley floor in its corner of eastern Washington. The Spokane Valley-Rathdrum Prairie Aquifer underlies an area extending from northern Idaho west into Washington and is considered one of the largest aquifers in the world.

What it serves up for Liberty Lake district consumers is water so pristine that it requires no disinfection process. While Bijay Adams, district general manager, considers the water source a blessing, it also is a constant challenge. “Because we pull it directly from the aquifer into our reservoirs and then to our customers, we do a lot of sampling and testing,” Adams says.

Acreage in and around the city of Liberty Lake formerly was dedicated to agriculture. Now it grows houses, and each new housing development is rigorously monitored by the district to ensure the hookups won’t somehow contaminate its system. Adams says water constantly is sampled and district staff is “religious” about blowing off dead-end lines and otherwise maintaining the integrity of the water-carrying system.

The goal is to continue to provide nonchlorinated water to customers. In the fall, a small shot of chlorine is added to the water to correct any impurities that might have crept in up to that point in the year. Otherwise, the disinfectant is not used. Adams believes the decision not to chlorinate helps keep his staff on their toes. “Those who operate chlorinated systems tend to get a little complacent. They say, ‘Oh, well, if there is a little something wrong, the chlorine will take care of it.’”

Liberty Lake system’s reservoirs can be chlorinated in an emergency, and Adams is ready to do so if a sampling of water shows the need for it. Till then, the district will keep supplying unadulterated pure water.

**The Liberty Lake team includes (left to right, front to back) administrative assistant Tricia Poitevint, Finance Manager Julie Garrett, General Manager Bijay Adams, Maintenance Superintendent Derek Nesbitt, water reclamation facility operator Greg Sattler, water reclamation facility operator Darrell Gamble, facility and grounds maintenance Ron Knudsen, water reclamation facility chief operator Dan Grogg, water and wastewater operations operator Hayden Symbol, development coordinator and inspector Chad Jennings, water and wastewater operations operator Cody Riggs, water and wastewater chief operator Mike West, and Environmental Manager Jeremy Jenkins at the utility’s water reclamation facility.**

structure for 50 cents on the dollar and rates for customers of the smaller system fell to \$19 from \$50, including a surcharge used for debt service so other customers wouldn’t be subsidizing the improvement,” Adams says. A \$2.7 million loan for a second phase of improvement has been applied for. Meanwhile, a second small water system, Greenridge, has been acquired with the same novel loan process.

And it all started with Adams’ initiative. “I knew we had the pumping capacity, so I just dug a little deeper.” His consolidation strategy earned the district a 2017 Environmental Protection Agency WATERS Award for innovative and effective use of revolving fund loan money to advance the cause of clean and safe drinking water. Adams has been singled out for other awards from peers in the industry as a consequence of his long-standing commitment to excellence in delivery of water and sewer services.

He clearly takes to heart the “special” in special district — embracing the agency’s singular focus on environmental protection of high-quality water and production of nonpolluting wastewater. “We are professionals,” he says. “This is all we do. We don’t muddy the water with street and electrical power systems and the like. We are a water district.” ♦



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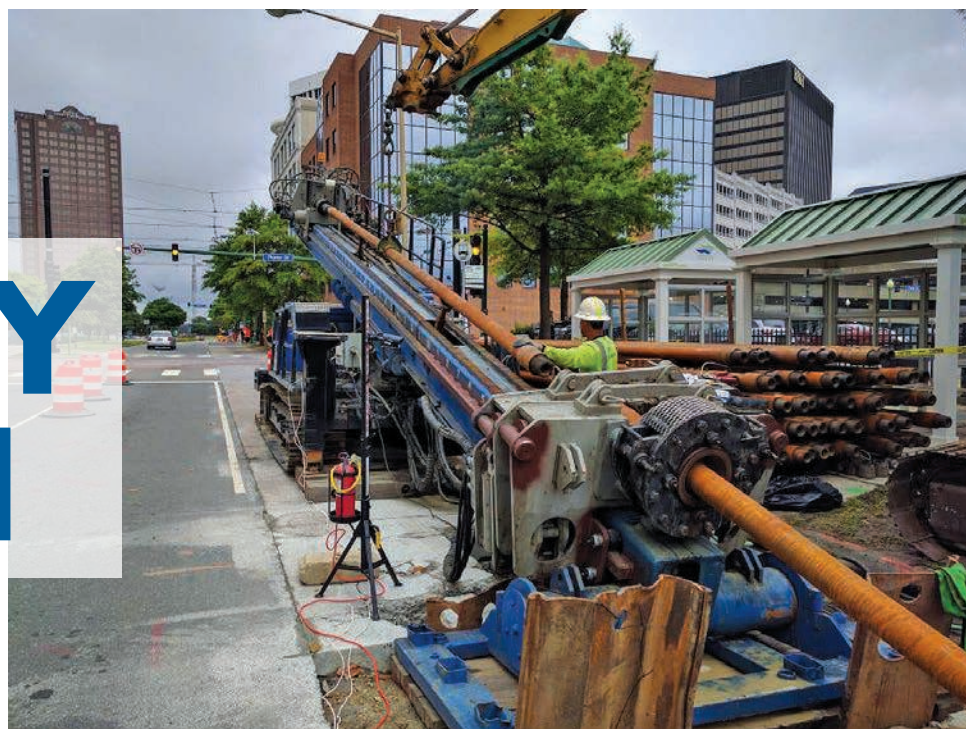
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# HISTORY LESSON

City, contractor and engineer work together to find a better solution for force main project

By Cory Dellenbach



**Tidewater Utility Construction used an American Augers DD-210 horizontal directional drill to install new pipe through heavy traffic areas along the route of the Hampton Roads Sanitation District force main project.**

What do you get when you cross open-cut with directional drilling and historical landmarks? The answer could be a recipe for disaster if something goes wrong.

The project was to replace a large segment of 36-inch prestressed concrete cylinder pipe force main in the downtown Norfolk, Virginia, area. The pipe was beyond its intended service and was starting to become a high-risk concern.

“Not only was it time for it to be prioritized for replacement, but it was also under an EPA consent order agreement,” says Will Gibson, project engineer for the engineering firm AECOM. “There were multiple reasons to get that pipe replaced or rehabilitated.”

The project originally was proposed as all open-cut. During construction, however, the general contractor decided it was worth exploring alternative methods on a troublesome portion of the route. If open-cut were to be used, it would affect more streets and a shopping mall and take longer to complete the project.

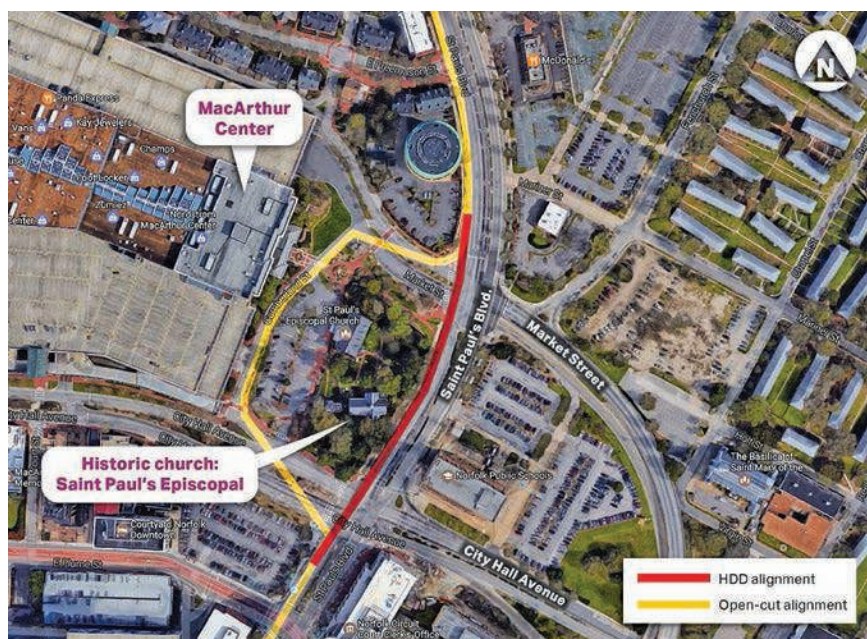
After several concepts were considered and eliminated, the contractor submitted a design-build proposal using a 1,000-linear-foot, 30-inch directional drill to keep the alignment straight and on its current path.

## An aging pipe

The Hampton Roads Sanitation District owns and operates the large regional force main interceptor system and 13 wastewater treatment plants, providing service to 18 counties and cities and approximately 1.7 million residents in the Hampton Roads region of Virginia.

In 2011, the district began the South Trunk Sewer Section G Force Main Replacement Project to replace about 6,000 linear feet of a large-diameter force main, constructed in the 1940s, in downtown Norfolk.

AECOM began by studying and comparing alignment plans to navigate the new replacement 30-inch ductile iron pipe force main through the major and minor streets of Norfolk. It was determined that most of the new



**The proposed route with and without directional drilling as an option. The yellow line indicates the route open-cut installation would have taken, while the red line shows the route for horizontal directional drilling operations.**

force main would be located along St. Paul's Boulevard (running north-south), which is a heavily traveled roadway for commuters and residents.

During the design phase, the Norfolk Utilities and Public Works Departments prohibited any work through the Market Street and City Hall Avenue intersections along the force main route. These intersections were vital to commuter access to and from St. Paul's Boulevard and Interstate 264, a major regional highway adjacent to downtown.

Trenchless crossings were explored at that time, but due to some construction projects in adjacent areas experiencing problematic crossings or ground settling, the city preferred finding open-cut solutions around the intersections.



**“We were surrounded by very large buildings, the high-end shopping mall, the downtown Norfolk courts complex and then some high-end residential condos and town houses. We had everything that you could imagine around us.”**

**Will Gibson**

“We stayed along the major corridor, and then we had to dive off that corridor to get around those two major intersections to continue with an open-cut alignment,” Gibson says.

The design was modified to align the force main down a small side street adjacent to Norfolk’s busiest shopping mall to avoid the intersections. The design through the tight corridor presented various challenges.

“Our restrictions on the contractor for that area were very tight,” Gibson says. “They could only work certain times of the year and certain times of the day, and a lot of it was confined to night work. There were a lot of stipulations there, which is why when the contractor got going, they wanted to take a look at HDD.”

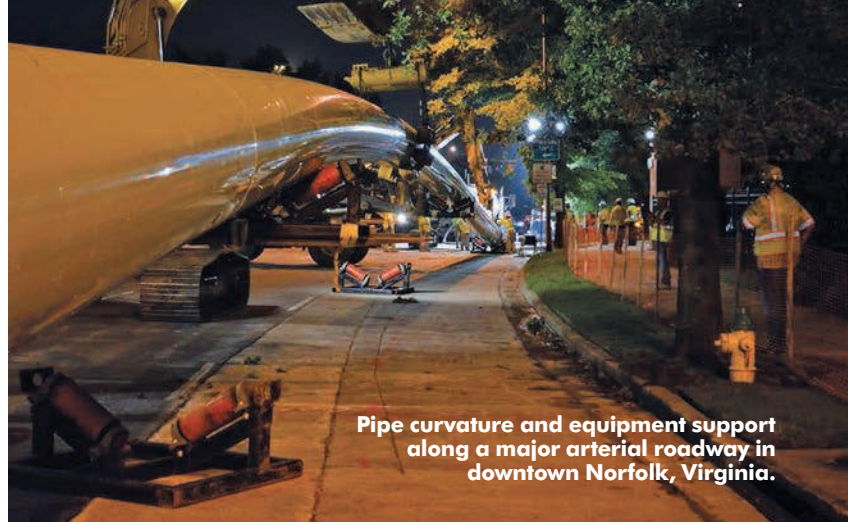
### Going with HDD

Early in the construction phase, the contractor, Tidewater Utility Construction, evaluated the challenges of the alignment and proposed several ideas to avoid the segment of open-cut installation. After several concepts were considered and eliminated, Tidewater Utility Construction submitted a design-build proposal using a 1,000-linear-foot, 30-inch horizontal directional drill along St. Paul’s Boulevard, continuing with the overall alignment.

“At that point, AECOM and the general contractor had made enough headway, done enough good work and impressed the city enough that they were willing to allow us to propose that and take a look at HDD,” Gibson says. “So the HDD actually wasn’t initiated until we were in the middle of construction, which makes it kind of interesting.”

HDD still posed some challenges, however, especially with the tight working area.

“We were surrounded by very large buildings, the high-end shopping mall, the downtown Norfolk courts complex and then some high-end



**Pipe curvature and equipment support along a major arterial roadway in downtown Norfolk, Virginia.**



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### PROFILE: Norfolk, Virginia

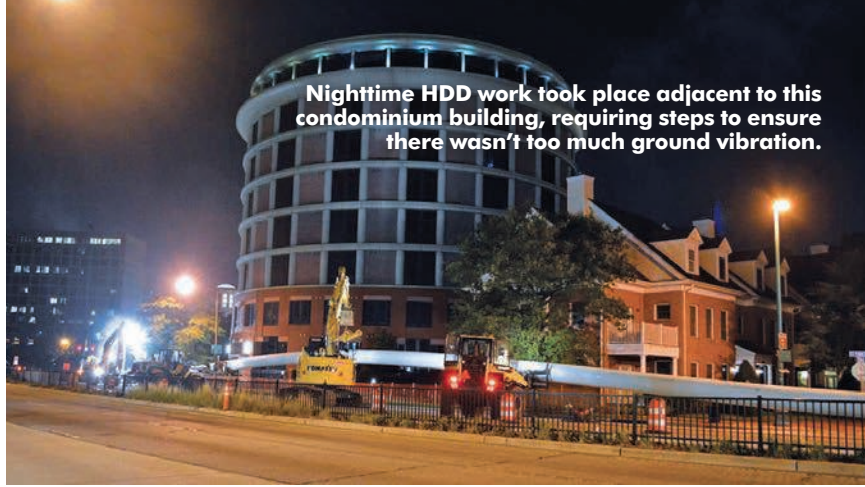


**PROJECT:**  
Installing a 1,000 section of new force main in Norfolk, Virginia

**CUSTOMER:**  
Hampton Roads Sanitation District

**CONTRACTOR:**  
Tidewater Utility Construction (general),  
Spring & Associates (subcontractor,  
directional drilling), AECOM (engineer)





Nighttime HDD work took place adjacent to this condominium building, requiring steps to ensure there wasn't too much ground vibration.

**“The overall results by doing the HDD were outstanding. We avoided the opencut, and we avoided, by going under those two intersections, impacting traffic.”**

**Will Gibson**

masses of brick and concrete, and all kinds of things that you probably would not want to drill through on a normal basis knowingly.”

There were other areas early in the design phase where they looked at doing a trenchless cross, only to find out the land had been built out and there was no guarantee of avoiding obstacles.

“We had to convince the city in some areas to stick with the opencut and not go with trenchless because of those obstacles,” Gibson says. “So this project actually ended up being a mix of microtunneling at the start, opencut and then HDD and then opencut again.”

One of the more substantial historical considerations was a church located along the directional drill route. The church, the oldest structure in Norfolk, was constructed in the 1730s and is on the National Register of Historic Places.

“The church was probably the most high-profile structure that we were working very closely to,” Gibson says. “It was obviously a very big concern, and we believe structurally that the church is kind of a slab-on-grade design. With anything HDD related, you always worry about the inadvertent returns, and with our alignment being within 100 feet of that church and the brick wall surrounding the church, we were concerned that if inadvertent returns went toward the church, possibly under or close to the structure, we would undermine it and have some settling issues.”

AECOM developed a monitoring plan, which included topographic survey, vibration monitoring and installation of monitoring wells. The topographic survey was a way to document the before and after elevations of above-ground features.

“The monitoring wells we drilled were about 12 feet down and we put in a perforated PVC pipe, and we did this about every 50 feet along the church, which is about a 500-foot span,” Gibson says. “They were designed as an early warning system. So if we had an inadvertent return heading toward the church, the idea is that those fluids would go up the bored wells and we would see fluid come out of them. If we did see that, we could shut down the operations and try to mitigate any returns heading toward the church and go with our contingency plans at that point.”

## Wrapping up

Fusing of the pipe took place concurrently with the drilling activities, and a full stringout was done prior to pipe-pull efforts. The city and the contractors agreed to complete the pullback in the nighttime hours.

Although the HDD installation accounted for just 1,000 feet of pipe out of the project's total 6,000 feet, the impact was substantial.

“The overall results by doing the HDD were outstanding,” Gibson says. “We avoided the opencut, and we avoided, by going under those two intersections, impacting traffic. We also credit the HDD with shaving about five months off the construction time.”

The early finish saved the city approximately a million dollars on a \$10 million-dollar project.

“The extra precautions that we took with the monitoring wells and just everybody being on the same page in terms of communicating and having the inspectors where they needed to be at the right time — all that quality assurance/quality control couldn't have gone better,” Gibson says. “It's what prevented anything from going wrong.” ♦

residential condos and town houses,” Gibson says. “We had everything that you could imagine around us. So even with HDD not having quite the staging requirements of a microtunnel, it's still a lot of equipment to put out there.”

AECOM, Tidewater Utility Construction, and the directional drill contractor, Spring & Associates, were required to submit a detailed staging plan to the city and explain where each piece of equipment was going to be, what kind of lane shutdowns were expected and all of the impacts of those.

“There was quite a submittal to the city just for them to sign off on how we were going to stage this,” Gibson says.

Crews were able to keep much of the staging to a single lane. Equipment included the American Augers DD-210 directional drill, the control room and the Tulsa Rig Iron MCM 1000 mud recycler unit all in a single lane of traffic, along with the entry pit.

“During nonrush-hour times, we were able to take a second lane just to open up the workspace a little bit,” Gibson says.

## Understanding history

Norfolk is a city rich with history dating back to the Colonial times of the 17th century. Understanding the city's historical evolution was critical during the design of the proposed pipeline.

“If you look at the history of the city, the downtown area was actually a lot more water area than it is today,” Gibson says. “The reason is because in the 1800s, the city expanded their landmass into the Elizabeth River and they did this by pretty much taking a landfill mass and other materials and just dumping it into the water to create the land and build it out.”

Because of that, many areas of downtown Norfolk are not applicable to trenchless technologies.

“What we found out during some preliminary studies was that a lot of the things they threw in there were huge,” Gibson says. “They were big

**One of the more substantial historical considerations was a church located along the directional drill route. It was constructed in the 1730s and AECOM developed a monitoring plan to serve as an early warning system and protect the structure.**





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# KEEPING UP WITH THE BIG CITIES



Newmarket tackles system maintenance and upgrades with all the best-practice tools and techniques of a larger utility

*By Erik Gunn*





**Sam Heffron (left) and Joel Drelick of the Newmarket Environmental Services Department clean a sewer main with their Vac-Con jet/vac truck. (Photography by Oliver Parini)**

**T**he town of Newmarket, New Hampshire, may be tiny and its Environmental Services Department might not be big enough to field a baseball team, but the utility takes itself just as seriously as its largest counterparts in water and sewer services across the nation.

And its responsibilities have been just as weighty, from successfully battling chronic water loss in its water distribution systems, to reducing inflow and infiltration in its sewer lines, to the need to overhaul aging infrastructure.

Facing challenges like those, Newmarket has been systematically pressing ahead, undertaking major renovations in both its water and sewer operations while planning ahead for more. Along the way, it's adopted the same sophisticated technologies of larger municipalities, as well as the best practices of the municipal environmental services industry.

"We're not seeing ourselves as a small municipality," says Sean Greig, Newmarket's Environmental Services director, whose department oversees both the distribution of clean water to the community's nearly 9,500 residents and collecting and treating the community's wastewater. "We're just trying to do what we can do. And it just happens we're keeping up with the big cities."

Newmarket is nestled in southeastern New Hampshire about 15 miles west of Portsmouth — closer as the crow flies, but the roads have to wind around Great Bay at the mouth of the Bellamy and Piscataqua rivers. Some 60 miles north of Boston, Newmarket is a one-time mill town that

has evolved into a bedroom community with old factories now made over into residential lofts and a variety of small businesses.

Newmarket's Environmental Services Department was formed in 1990 from the merger of what were then separate water and sewer commissions. The community's water supply comes from three wells. The two oldest, Bennett and Sewall, are gravel-packed wells that have historically produced "beautiful drinking water," Greig says.

After a drought started in 1998, the town restarted an existing water treatment plant to purify surface water, but the system was unable to meet higher federal Clean Water Act standards, so that was eventually shut down. To meet the need for more water — the town's population has grown by about 10 percent since the year 2000 — Newmarket brought a third well (MacIntosh) online in 2016 and has a fourth one (Tucker) in development for future use.

### **Aging infrastructure**

"Because we're in the Northeast and because our community is so old, our biggest challenge is aging infrastructure," Greig says.

After having worked in the department in various other jobs, Greig was named director in 2008. In past decades, the community didn't put aside funds to maintain and replace the system, so Greig and his immediate predecessors had to play catch-up. An early project, begun before his promotion, was replacing water meters throughout the system to reduce water loss and help the



**The Newmarket Environment Services Department includes (from left) Ben Trottier, Sean Greig, Todd Gianotti, Sue Landale, Shayne Barbosa, Joel Drelick and Sam Heffron.**





## PROFILE:

Newmarket (New Hampshire)  
Environmental Services  
Department

### POPULATION SERVED:

9,482 people; 1,900 sewer accounts

### SERVICE AREA:

Town of Newmarket

### VOLUME:

Treats on average 480,000 gpd; average daily flow 0.85 mgd design, 3.2 mgd peak

### INFRASTRUCTURE:

22 miles of sewer mains, 1.8 miles force mains, 6 pumping stations, 4 private pumping stations

### ANNUAL OPERATING BUDGET:

Sewer \$2.15 million

### WEBSITE:

[www.newmarketnh.gov/water-wastewater](http://www.newmarketnh.gov/water-wastewater)

**Sean Greig (left) and Joel Drelick look at a live view of a sewer line inspection with a Pearpoint/SPX camera.**

town bill more accurately for water service.

In addition to replacing existing meters for paying customers, the department also decided to put more meters in, even where they wouldn't be used to actually bill customers — for the park system, the highway department and similar locations. "We may not be billing them, but we're seeing where all the water's going," he explains. And still other customers weren't being billed properly but should have been.

## Improved efficiency

While water loss ranged from 20 percent to as high as 29 percent in the years 2006 through 2010, according to a 2017 report to the town, it has declined to as low as 3 percent currently, Greig says. And thanks to greater customer awareness about water overuse and the spread of more efficient products at the consumer end, from dishwashers and washing machines to stingier showerheads, the town is also saving water through conservation.

"We used to pump about 160 million gallons of water into the system a year," Greig says. "Now we're pumping about 133 million." While progress was already being made before he took over the department, there was also the challenge of how much work remained. "If you actually looked at everything and tried to do everything, you probably would have just gone crazy," he observes.

So early in his tenure, the crew decided to list everything it could — "all our issues." And instead of getting bogged down agonizing over "what we can't do," the department flipped the script. "We started looking at things and trying to prioritize things based on what we can do. We'd do one step at a time and see what the improvement was. We started picking things off that list, and things started getting better and better and better."

In 2011, the department updated its previous capital improvement plan for the water system, and in 2017 Newmarket commissioned a 20-year build-out plan that projects a 36 percent growth in water demand over that period. Along with that plan, the town has an asset management program for its water distribution and treatment infrastructure. The oldest waterlines in the 28-mile distribution system are cast iron dating back to 1894. They are being replaced with ductile iron.

Greig says town officials have already committed to the first 10 years of projects in that proposal, which will include removing the last 5 or 6 miles of cast iron waterline still in use.

## Planning ahead

On the sewer side of the department, Newmarket completed a major upgrade of its wastewater treatment plant about a year ago. The five-year, \$11 million project included a complete conversion from trickling filter treatment to a four-stage Bardenpho process, as well as replacing pumping equipment, aeration tanks and other components. At the same time, Greig says, the department is already thinking ahead to the next time something will need to be fixed. Having valued the replacement cost of equipment and calculated its life span, "what that came to was \$150,000 a year we're setting aside to replace equipment when it needs to be replaced."



Now at the top of his agenda is an overhaul for the town's six wastewater pumping stations, as well as development of an asset management and growth plan drawing on the 2017 build-out study.

"The ultimate goal is to take those two plans" — for the water and sewer systems — "and then to overlap them and see if there's some projects we can do together to save money," he explains. He also aims to work with the town's Public Works department to see if any such projects can be bundled with roadwork and drainage areas to help save money and make more efficient use of time spent tearing up rights-of-way, "so we can do projects that can impact the community a lot more and give a better product at a lower cost," he says.

### People and equipment

Greig takes pride in the department's investment in equipment, including its 2004 Vac-Con combination truck (built on an International platform) that was rebuilt in 2016 for \$150,000, "far less than purchasing a new one for \$330,000," Greig says.

In 2012 the department invested in GPS mapping technology using Trimble Yuma GPS-equipped field tablet computers and has since mapped the entire water and wastewater systems. More recently, the department acquired a sewer camera and has been using it to inspect lines after every cleaning.

While the new technology and equipment has had a big impact, Greig knows the value of investing in good people to make it work, but that isn't always easy for a small municipal utility.

"We're competing with all these bigger communities around us," Greig says. "If you go to the bigger city, they pay more money. We want to keep good people, so we try to compete with the wages. But how we do it here, we just try to be a good place to work."

### Cross-training

One of his main tactics is cross-training his staff of seven people. If someone gets hired elsewhere, he knows that the departing employee's work can still get coverage while a replacement is recruited. Although not required to get licenses outside their primary assignment, he encourages them to do so.

"I structured my department so that anybody can basically do anybody's job," he says. Yes, there are titles — the wastewater maintenance director, laboratory director, director for the distribution and collections systems, water operations director and so on. But at the same time, they're also trained to fill in for each other in the event of absence or a departure.

There's no holding back, no professional silos: Sharing information about your particular work is the order of the day. Greig says he abides by that same principle, so "if someone leaves, we're not stuck — everybody will know my job."

"Where I really sold everybody on this is: 'Who wants to do the same job every day? Isn't it much more interesting if you're doing different things?'" Of course, it does give another selling

**"We're not seeing ourselves as a small municipality. We're just trying to do what we can do. And it just happens we're keeping up with the big cities."**

Sean Greig

point that could subject him to even tougher competition from outside employers: "It makes you more marketable if you want to go someplace else."



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**“We started picking things off that list, and things started getting better and better and better.”**

**Sean Greig**

“It works for everybody,” Greig continues. “It’s good for them because it makes them better, well-rounded people to maybe aspire to something higher. But it also helps out the town as well because we’re getting more out of them.”

### Setting goals

His other principle is to ensure staff members have autonomy at work. “They’re in charge of their deal, and I let them do their job,” Greig says. “I hold them accountable because I want them to take ownership in what they’re doing.”

His standing message for everyone, he says, is this: Walk around, open up your eyes and look for ways to improve. “And we sit down at the beginning of every year and go over goals and things that we’re looking at doing. And then at the end of the year, we sit there and say, ‘Well, did we improve? Did we get better? What worked? What didn’t work?’”



**Sam Heffron (left) and Ben Trottier connect the vacuum boom extension to clean debris from a sewer line.**

He’s proud of how well they’ve come through. “I couldn’t tell you everything we’ve done so far in the past 10 or more years to get as far as we have, because they’re really good,” Greig says. “They have taken ownership in what they have, a pride in what they have, and so we have a very successful program.” ♦

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## STAYING IN TOUCH WITH THE PUBLIC

For its small size, Newmarket, New Hampshire’s Environmental Services Department has an impressively big footprint on the internet and especially on social media.

The department’s website, of course, is just a section of the town’s website, but it’s well-organized with information both on the department’s ongoing capital improvement efforts, as well as subjects such as public service announcements on water conservation, keeping the sewer system running smoothly and practical insights on subjects such as bills and budgets.

Even more impressive is the agency’s Facebook presence, where the department engages visitors with a wide range of messages. New posts go up at least three or four times a month and often more frequently.

The Facebook page was originally started by Joel Drelick, the department’s Water and Wastewater System technician, says Sean Greig, the Environmental Services Department’s director. It became, along with the website, another communications channel “just to tell people what was going on” in the department’s work.

Then, last year, Greig was able to hire his first administrative assistant, Sue Landale. Maintaining the website and the Facebook page fell to her, with Drelick giving some guidance. Since then, Greig says, the content of both have ramped up considerably.

“She’s been really working on our website to get it where it needs to be,” Greig says. And even more with the Facebook page.

Landale already had some initial understanding of the department’s

work. She came to the job from the town hall, where she had been doing billing for water and sewer services, so she already knew Greig. The move “seemed like a natural transition to me,” she says.

But a key to her success with the internet communication features, Greig says, is that Landale didn’t know much about the technical side of the water and sewer operations. What she did know is what kind of posts would spark interests among the town’s ratepayers.

“She really pushes my guys for information on stuff to put on there,” her boss says. And they oblige — sometimes with the wastewater industry version of “gruesome pictures,” he says with a chuckle.

“She was looking at a different perspective than we were to get the message out. We’re talking in wastewater language or water language, which we talk all the time, and the everyday person just looks at us completely perplexed.”

When Landale learns about some obscure sewer or water fact that she figures will interest ordinary customers, she asks questions, helps explain it in everyday language and puts up a post about it.

And, evidently, she has a ball doing so. With the fact that “no two days are the same,” Landale says, she enjoys planning her own workload and the job of helping present the department’s digital face to the world.

She’s modest about her work, though — like when, instead of bragging about her attention to detail, she just jokes that she’s using her “OCD skills.” And she credits a “really good tutorial” that gave her pointers on how to build and maintain the website.

“It’s learn as I go,” she says. And for her department, it sounds like she’s learning exactly what she needs to.



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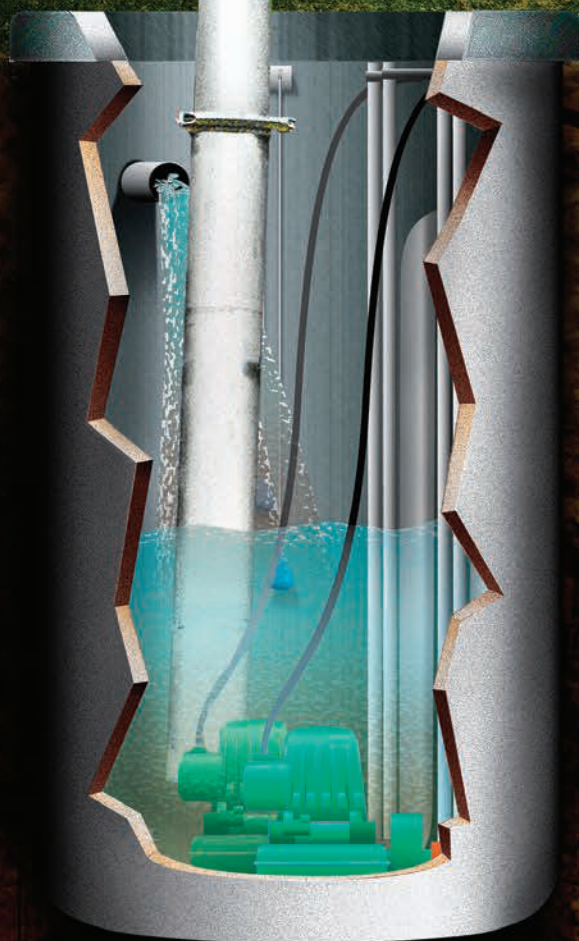


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# 19 SEWER NOZZLES DIRECTORY

# MANUFACTURERS

MANUFACTURER	NAME OF NOZZLE	APPLICATION	PIPE DIAMETER	FLOW RATE (GPM)	MAX OPERATING PRESSURE (PSI)	WEIGHT	NUMBER OF AVAILABLE FRONT JETS	NUMBER OF AVAILABLE REAR JETS	HOSE SIZE / CONNECTING THREAD
<b>Aqua Mole Technologies Inc.</b> 3778 Timberlake Dr. Richfield, OH 44286 877-457-2782 330-523-5317 www.aquamole.com aquamole@sbglobal.net	Custom Drilled Nozzles	Aqua Mole offers custom designs for specific applications: cleaning from downstream up, from structure out to main, long distance pulling, specific types of debris removal, etc. We can work with ANY jetter, no matter the flow rate.							
	Monster Mole	Dual angle nozzle used to clean sand, gravel and grit	2" to 24"	1.7 to 80	200 - 10,000	.3 oz. for 1/8" NPT up to 16 oz. for 1" NPT	1	6	1/8", 1/4", 3/8", 1/2", 3/4", 1" NPT
	RH Super Thruster (15" or 20" rear angle)	Maximizes distance capability w/ penetrating power	2" - 24"	1.7 to 25	200 - 10,000	.5 oz. for 1/8" NPT up to 3.0 oz. for 1/2" NPT	1	3, 4, or 6	1/8", 1/4", 3/8", 1/2" NPT
	Degreaser & High Thrust Degreaser	Clearing grease blockages, pushing debris forward	2" - 24"	2.5 to 80	200 - 10,000	.3 oz. for 1/8" NPT up to 16 oz. for 1" NPT	3	6	1/8", 1/4", 3/8", 1/2", 3/4", 1" NPT
	Super Pusher	Optimized nozzle for pushing debris forward	2" - 24"	2.5 to 25	200 - 10,000	.5 oz. for 1/8" NPT up to 3.0 oz. for 1/2" NPT	3	6	1/8", 1/4", 3/8", 1/2" NPT
	Thruster 3R, Thruster 4R, Thruster 6R	Clear blockages going upstream	2" - 24"	1.7 to 80	200 - 10,000	.3 oz. for 1/8" NPT up to 16 oz. for 1" NPT	1	3, 4, or 6	1/8", 1/4", 3/8", 1/2", 3/4", 1" NPT
	Blind Thruster 3 Rear, 4 Rear, or 6 Rear (jets)	25" rear angle for pulling. More jets add additional coverage	2" - 24"	1.7 to 80	200 - 10,000	.3 oz. for 1/8" NPT up to 16 oz. for 1" NPT		3, 4, or 6	1/8", 1/4", 3/8", 1/2", 3/4", 1" NPT
	Flusher, Flusher 8R & Flusher 12R	45° rear angle for flushing line from either end	2" - 24"	1.7 to 100	200 - 10,000	.3 oz. for 1/8" NPT up to 16 oz. for 1" NPT		6, 8, or 12	1/8", 1/4", 3/8", 1/2", 3/4", 1" NPT
	Corner Mole (3 jets @ 45°, w/ one 90° side jet)	Helps operator to make tight turns	2" - 24"	1.7 to 25	200 - 10,000	.3 oz. for 1/8" NPT up to 1.5 oz. for 1/2" NPT	1	3 @ 45°, 1 @ 90°	1/8", 1/4", 3/8", 1/2" NPT
 <b>ARTHUR PRODUCTS CO.</b> an LSG Mfg Company <b>Arthur Products Co.</b> 1140 Industrial Pkwy. Medina, OH 44256 800-322-0510 330-725-4905 (f) 330-722-2698 www.arthurproducts.com apc@apclsq.com com See ad page 8	Yellow Jacket Tier 2 Nozzle	Multi-purpose, lightweight, 22 inserted ports general cleaning	4" - 12"		10,000		4	12	3/8" - 1/2"
	Chisel Tier 2 Nozzle	Penetrate and cut	4" - 12"		10,000		4	6	3/8"
	Eg-A-Nator Tier 2 Nozzle	General cleaning with thrust	4" - 12"		10,000		1	6	3/8" - 1/2"
	Penetrator Hex	Penetrate and flush	4" - 12"	4			Custom drilled	Custom drilled	3/8" - 1/2" - 3/4" - 1"
	Contractor Nozzles 3.75" OAL	General cleaning	4" - 12"				Custom drilled	Custom drilled	1"
	Short Contractor Nozzle 3" OAL	General cleaning	4" - 12"		10,000		Custom drilled	Custom drilled	1"
	Penetrator Elongated	Breaking and penetrating	4" - 12"				Custom drilled	Custom drilled	1"
	Tow Hook	Pushing debris forward or wall cleaning while being towed through pipe	4" - 12"					Custom drilled side or rear	1/4" - 3/8" - 1/2"
 <b>Envirosight</b> 111 Canfield Ave., Unit B3 Randolph, NJ 07869 866-936-8476 973-252-6700 (f) 973-252-1176 www.envirosight.com mail@envirosight.com See ad page 2	Jetscan	HD Video Assessment	6" to 24"		3,000	3-5 lbs.		6	
<b>Enz USA Inc.</b> 1585 Beverly Ct., Unit 115 Aurora, IL 60502 877-369-8721 630-692-7880 (f) 630-692-7885 www.enzusainc.com sales@enzusainc.com See ad page 43	Bulldog Antiblast	Anti-toilet blowing in residential	8" - 24"	55 to 80	1,500 - 1,800	17 lbs.	6		1" - 1 1/4"
	Bulldog	Cleaning grease, roots, deposits, etc.	8" - 24"	50 to 120	2,000 - 2,900	17 lbs.	7	6	1" - 1 1/4"
	Rotodrill	Cleaning blocked pipes, frozen pipes, heavy debris	2" - 14"	13 to 80	2,000 - 4,000	0.25 lbs. to 1.5 lbs.	1	6	1/2" - 1"
	Grenade	Flushing heavy debris	6" - 12"	40 to 80	2,000 - 3,600	11 lbs.		10	1"
	Chisel 60.100L	Penetrating clogs, root masses, frozen pipes	6" - 16"	50 to 80	2,000 - 3,600	6 lbs.	4	6	1"
	10.125TR Chain Scraper	Root removal, hard grease, hard deposits	5" - 12"	14 to 80	2,000 - 3,600	6 lbs.		6	1"
	10.200R Rotating Chain Scraper	Removal of root masses, clogs, hard deposits	8" - 16"	50 to 80	2,000 - 3,600	78 lbs.		6	1"
	10.400R Rotating Chain Scraper	Removal of root masses, clogs, hard deposits	16" - 32"	80 to 120	2,000 - 3,600	105 lbs.		6	1"
	14.200 Milling Cutter	Removal of concrete & mineral deposits, dropped liners	8"	80 to 120	2,000 - 2,200	70 lbs.		6	1" - 1 1/4"
	Bulldozer 50.100G	Flushing debris from large pipe	16" - 40"	40 to 80	2,000 - 3,600	57 lbs.	1	8	1"





# '19 SEWER NOZZLES DIRECTORY MANUFACTURERS

MANUFACTURER	NAME OF NOZZLE	APPLICATION	PIPE DIAMETER	FLOW RATE (GPM)	MAX OPERATING PRESSURE (PSI)	WEIGHT	NUMBER OF AVAILABLE FRONT JETS	NUMBER OF AVAILABLE REAR JETS	HOSE SIZE / CONNECTING THREAD
<b>General Pipe Cleaners</b> 1101 Thompson Ave., McKees Rocks, PA 15136 800-245-6200 412-771-6300 www.drainbrain.com info@drainbrain.com	Chisel Point Nozzle	Penetrating, breaking up debris	4" - 10"	12	2,500	4 oz.	4	6	1/2"
	Traction Nozzle	Sand and mud removal	4" - 10"	12	2,500	8 oz.	1	6	1/2"
	Cleaning Nozzle	Maintenance cleaning	4" - 10"	12	2,500	12 oz.		8	1/2"
	Spring Leader Nozzle	Guiding hose around tight bends	2" - 10"	1.5 to 8	1,500 - 3,000	4 oz.		3 to 4	1/8" - 1/4" - 3/8"
	Downhead Nozzle	Dropping down T's	2" - 4"	1.5 to 4	1,500 - 3,000	2 oz.		3	1/8"
	Chain Saw Nozzle	Cutting roots	4" - 10"	4 to 12	2,500 - 3,000	2 lbs.		2 to 4	3/8" - 1/2"
	Rotary Nozzle	Scour pipe walls clean	2" - 10"	1.5 to 12	1,500 - 3,000	2 oz. to 10 oz.		2 to 4	1/8" - 1/4" - 3/8" - 1/2"
 <b>NozzTeq Inc.</b> Taking Science To The Sewer 1497 Main St. #354 Dunedin, FL 34698 727-233-4979 (f) 603-413-6744 www.nozzteq.com info@nozzteq.com See ad page 48	BL Swiper (Med)	Reduce blown toilets and safe in lined pipes	8" - 18"	15 to 250	400 - 4,000	3 lbs.		4	1/2" - 3/4" - 1" - 1 1/4"
	HAMMERHEAD	High performance sewer cleaning or storm water cleaning	6" - 12"	5 to 80	400 - 4,000	4 lbs.		4	1/2" - 3/4" - 1"
	Multi-Global Nozzle	Sewer and pipe cleaning for penetration	2" and Up	4 to 170	400 - 4,000	2 lbs.	4	1 - 6	1/2" - 3/4" - 1" - 1 1/4"
	JAWS	High performance sewer and pipe cleaning heavy debris	6" - 30"	30 to 265	400 - 4,000	7 lbs.		5	1/2" - 3/4" - 1" - 1 1/4"
	IceBear Penetrating Nozzle	Sewer and pipe cleaning penetrating nozzle	1" and Up	4 to 170	400 - 4,000	1 - 3 lbs.	3		1/4" - 1/2" - 3/4" - 1" - 1 1/4" - 1 1/2"
	C-RAY 200	Bottom cleaning for sewer and pipe	12" - 36"	30 to 265	400 - 4,000	22 lbs.	1	6	1/2"
	C-RAY 400	Bottom cleaning for sewer and pipe	15" and Up	40 to 350	400 - 4,000	42 lbs.	1	8	3/4" - 1" - 1 1/4" - 1 1/2"
	BL Swiper (large)	Ventura effect type nozzle to clean with water in the line and sucks the water down	15" and Up	40 to 265	400 - 4,000	13 lbs.		39	
	Spinner Nozzles (No rebuilds)	Grease and other obstructions	4" and Up	14 to 350	400 - 4,000	3 - 15 lbs.	2		1/2" - 3/4" - 1" - 1 1/4" - 1 1/2"
	Goblin Grease Eater™	Grease nozzle sewer lines or storm lines	6" and Up	40 to 350	400 - 4,000	12 lbs.	1	10	3/4" - 1" - 1 1/4" - 1 1/2"
	NATAB	Penetration with sewer and pipe cleaning	4" - 12"	5 to 50	400 - 4,000	3 lbs.	1	4	1/2" - 3/4"
	BL Swiper (Small)	Helps reduce blown toilets with 1/2" and 3/4" units	4" - 12"	10 to 80	400 - 4,000	2 lbs.		4	1/2" - 3/4"
	MONRO-JET	Hydro-excavation	2" - 8"	3 to 20	2,000 - 36,000	2 lbs.	1		1/2"
	ORCA	Two truck operation at either end of the pipe	15" - 60"	40 to 350	400 - 4,000	15 lbs.		8	3/4" - 1" - 1 1/4" - 1 1/2"
	Missile Nozzle	Heavy duty cleaning with optional front jet	6" - 36"	40 to 265	400 - 4,000	10 lbs.	4	6	3/4" - 1" - 1 1/4" - 1 1/2"
<b>Root Rat</b> PO Box 740 Bolivar, OH 44612 800-288-7873 330-874-4300 (f) 330-874-4448 www.rootrat.net kelly@chempure.com See ad page 53	Golden Nozzle	Recycled water use with our same tube system technology	6" - 36"	40 to 265	400 - 4,000	6 lbs.	1	6	3/4" - 1" - 1 1/4" - 1 1/2"
	C-RAY 800	Dual truck operation for double the flow for large pipes	36" - 96"	120 to 350	400 - 4,000	50 lbs.		8	3/4" - 1" - 1 1/4" - 1 1/2"
<b>Sewer Equipment</b> 1590 Dutch Rd. Dixon, IL 61021 888-477-7611 (f) 815-284-0453 www.sewerequipment.com sales@sewerequipment.com See ad page 27	Root Rat	Roots & encrustations	2" - 30"	4 to 150		0.5 lbs. - 5 lbs.			
	Mini Missile	General cleaning	3" - 12"	18 to 80	0 - 4,000	5 lbs.	1	3	1/2", 3/4", 1"
	Weisel	General cleaning	3" - 15"	18 to 80	0 - 4,000	2 lbs.		8	1/2" - 3/4" - 1"
	Dual Degree	General cleaning	4" - 18"	18 to 80	0 - 4,000	5 lbs.		8	1/2" - 3/4" - 1"
	Tri-Star	Penetrating	3" - 24"	18 to 80	0 - 4,000	3 lbs.	4	6	1/2" - 3/4" - 1"
	Avanti	Penetration - rotational	3" - 24"	18 to 80	0 - 4,000	4 lbs.		6	1/2" - 3/4" - 1"
	RDS	Heavy cleaning	3" - 28"	18 to 150	0 - 4,000	4 lbs.		6	1/2" - 3/4" - 1" - 1 1/4"
	Mega 5 & 6	Flushing	12" - 120"	18 to 80	0 - 4,000	35 lbs.		11	1/2" - 3/4" - 1" - 1 1/4"
	HW	Flushing	4" - 18"	18 to 55	0 - 4,000	3 lbs.		8	1/2" - 3/4" - 1"
	Combi	Cutting	4" - 24"	18 to 80	0 - 4,000	6 lbs.	3	6	1/2" - 3/4" - 1"
 <b>SewerProShop LLC</b> 1061 Triad Ct., Ste. 1 Marietta, GA 30062 877-864-9394 470-592-1715 (f) 770-984-2802 www.sewerproshop.com info@sewerproshop.com See ad page 33	Patriot 1	Root & grease cutting	4" - 24"	40 to 80	0 - 3,000	25 lbs.		5	3/4" - 1"
	Viper Chain Cutter	Roots, grease, scaling	10" - 48"	40 to 100	2,000 - 4,000	45 to 70 lbs.		8	1" - 1 1/4"
	General Nozzle	All-around sewer cleaning, prevent, maint.	4" - 16"	18 to 80	2,000 - 4,000	1.5 to 9 lbs.	1	8	1/2" - 1"
	Power Pull Nozzle	Mud, sand, silt	4" - 12"	18 to 80	2,000 - 4,000	1.5 to 9 lbs.		8	1/2" - 1 1/4"
	Spear Nozzle	Penetrating clogs, root masses, frozen pipes	8" - 24"	50 to 80	2,000 - 4,000	6.2 lbs.	4	6	3/4" - 1 1/4"
	Emperor Nozzle	Flushing heavy debris from large lines	12" - 32"	80 to 120	2,000 - 2,500	19.8 lbs.		12	1" - 1 1/4"
	Penetrator Nozzle	Flushing heavy debris in lines with off-sets	6" - 16"	50 to 80	2,000 - 4,000	15.4 lbs.	1	8	3/4" - 1 1/4"
	Stealth Nozzle	Flushing heavy debris	8" - 24"	60 to 80	2,000 - 4,000	17.6 lbs.		8	3/4" - 1 1/4"
	Raptor Nozzle	Penetrating clogs, root/grease masses, frozen pipes	4" - 24"	18 to 80	2,000 - 4,000	2.4 to 5.5 lbs.	3	3 (1/2") 6 (1")	1/2" - 1"
	Big Foot Nozzle	Flushing debris from the floor of large pipes	16" - 48"	40 to 120	2,000 - 3,600	33 to 56 lbs.		6 - 14	1" - 1 1/4"
	Twister Nozzle	Cleaning grease, roots, mineral deposits, etc.	8" - 24"	50 to 120	2,000 - 3,600	15.4 lbs.	5	4	1" - 1 1/4"
	Milling Cutter	Removal of concrete, tuberculation failed liner	4" - 20"	60 to 120	2,000 - 2,500	18 to 44 lbs.	4	4	1" - 1 1/4"



# '19 SEWER NOZZLES DIRECTORY MANUFACTURERS

MANUFACTURER	NAME OF NOZZLE	APPLICATION	PIPE DIAMETER	FLOW RATE (GPM)	MAX OPERATING PRESSURE (PSI)	WEIGHT	NUMBER OF AVAILABLE FRONT JETS	NUMBER OF AVAILABLE REAR JETS	HOSE SIZE / CONNECTING THREAD
 <b>SPARTAN</b> <b>Spartan Tool</b> 1506 W Division St. Mendota, IL 61342 800-435-3866 www.spartantool.com sales@spartantool.com	Warthog	Roots, grease	2" - 18"	12 to 35	2,000 - 4,000	1 - 5 lbs.			3/8", 1/2"
	Sandshoe	San, dirt and rocks	4" - 18"	12 to 18	2,000 - 4,000	7 lbs.			3/8", 1/2"
	Rotating	Scrubbing pipe walls	2" - 12"	4 to 18	2,000 - 4,000	1 - 3 lbs.			1/4", 3/16", 3/8", 1/2"
	Q Nozzle	Downstream jetting	4" - 12"	12 to 18	2,000 - 4,000	1 - 2 lbs.			3/8", 1/2"
	Rocket Nozzle	Long distance jetting	4" - 12"	12 to 18	2,000 - 4,000	2 lbs.			3/8", 1/2"
	Closed Nozzle	Standard jetting	2" - 12"	4 to 18	2,000 - 4,000	1 lb.			3/8", 1/2"
	Open Nozzle	Standard jetting	2" - 12"	4 to 18	2,000 - 4,000	1 lb.			3/8", 1/2"
	Brass Ball	Stainless steel hose jetting	2" - 8"	4 to 18	2,000 - 4,000	1 lb.			3/16"
	Chain Scraper	Roots, hard grease, scale	2" - 8"	8 to 50	5,075				3/8", 1/2", 3/4"
 <b>USB-USA</b> <b>USB-USA LLC</b> 7565 Owl Creek Dr. Douglasville, GA 30134 844-285-5770 www.usb-usa.com usb-usa-llc@gmail.com See ad page 45	Primus 3D	Grease, crusts, light roots	4" - 24"	18 to 120	2000 - 4,000	2.6, 7.0, 8.3, 20.1	1	3, 4, 5, 6	1/2" - 3/4" - 1" - 1 1/4"
	Rocket 3D	Sand, silt, large debris	4" - 24"	12 to 120	2,000 - 4,000	.6, 2.6, 4.85, 11.4, 44		6, 8, 10, 12	1/2" - 3/4" - 1" - 1 1/4" - 1 1/2"
	Pipe Wolf 3D	Total blockages from roots, grease & other organic matter	4" - 24"	14 to 120	2,000 - 4,000	24, 5.7, 11.9		6	1/2" - 3/4" - 1" - 1 1/4"
	Bagger Max 3D	Sand, silt, solids, sludge & other heavy debris	18" - 96"	50 to 120	2,000 - 3,000	33, 53, 66, 114.5	5	6, 8, 10, 12	3/4" - 1" - 1 1/4" - 1 1/2"
	Chisel	Total blockages from roots, grease, etc.	2" - 15"	8 to 120	2,000 - 4,000	.22, .33, .66, 1.54	4		1/4" - 3/8" - 1/2" - 3/4" - 1" - 1 1/4"
	FS 3D	Total blockages from roots, grease & other obstructions	2" - 15"	8 to 80	2,000 - 4,000	.22, .44, .66, 1.54, 3.7	4	6, 5, 6, 8	1/4" - 3/8" - 1/2" - 3/4" - 1"
	Tri-Jet 3D	Mud, sand, silt - everyday cleaning	4" - 48"	60 to 120	2,000	4.8, 12.1, 17.6, 23.1, 44		12, 15	1" - 1 1/4"
	FD 23D	Half-open or complete open drains - mud, sand, silt	4" - 12"	14 to 120	2,000 - 4,000	2.6, 4, 8.3, 14.3		6, 8	1/2" - 3/4" - 1" - 1 1/4"
	3D Extreme	Mud, sand, silt	6" - 15"	40 to 120	2,000 - 3,000	9.4	1	8	3/4" - 1" - 1 1/4"
	3D Cleaning	Everyday cleaning - sand, mud, silt, grease	4" - 15"	14 to 80	2,000 - 4,000	.6, 12.1, 17.6, 23.1	1	6, 8, 10, 12	1/2" - 3/4" - 1" - 1 1/4"

# '19 SEWER NOZZLES DEALERS/DISTRIBUTORS DIRECTORY

DEALER/DISTRIBUTOR	NOZZLE LINES
<b>American Jetter</b> 6908 Pine Grove Rd, Knoxville TN, 37914 866-944-3569 • 865-524-4647 • (f) 865-247-5101 www.americanjetter.com • andy@americanjetter.com See ad page 53	<b>Aqua Mole, StoneAge, Warthog</b>
 <b>GapVax, Inc.</b> 575 Central Ave., Johnstown, PA 15902 888-442-7829 • 814-535-6766 • (f) 814-539-3617 www.gapvax.com • scott@gapvax.com See ad page 55	<b>Sewer Pro Shop - Blue Star Nozzles, StoneAge - Classic, ENZ USA</b>
 <b>Super Products</b> 17000 W Cleveland Ave., New Berlin, WI 53151 800-837-9711 • 262-784-7100 • (f) 262-784-9561 www.superproductsllc.com See ad page 9	<b>Storm Surge 3D, PRIMUS III, S200 Turbo Cutter, USB-USA LLC, Recycling Grand Slam</b>
 <b>VAC-CON</b> MORE POWER TO YOU 969 Hall Park Rd., Green Cove Springs, FL 32043 904-284-4200 www.vac-con.com • vns@vac-con.com See ad page 56	<b>Sewer Robotics, ENZ USA</b>
 <b>Water Cannon Inc.</b> 4300 W Lake Mary Blvd., Units 1010-424, Lake Mary, FL 32746 800-333-9274 • (f) 888-928-9274 www.watercannon.com • sales@watercannon.com	<b>Aqua-Nozzle, Arzino, Canin, Carnia, Fara, Isonzo, Raut, Natisone, Piave, Rotor Spin, Tremol, Turbo Avian</b>





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AllExcavate hydro excavators by Vacall are calmly addressing the urgent need to replace over 18 miles of water service mains in Milwaukee. Operators appreciate the easy startup and operating procedures, using exceptional Vacall jet-vac power to dig down 15 feet, expose lead water pipes and clear the area for new pipes.

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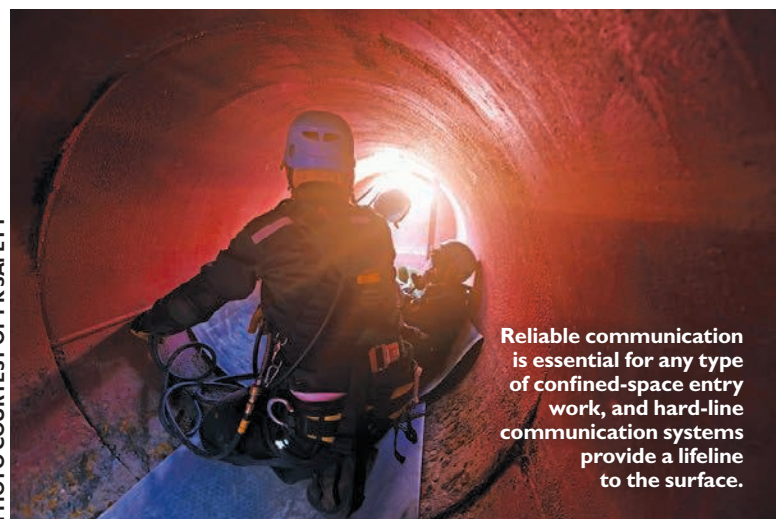




# IN TOUCH WITH THE UNDERGROUND

New technology provides clear, dependable communication for confined-space work

By Analisa Harangozo



**S**ewer cleaning has a number of unique atmospheric hazards, thanks to the lack of natural air movement and an abundance of toxic and combustible gases. In an environment with hazards like these, communication with outside staff members and emergency medical services may mean the difference between life and death.

Good communication is essential at any sewer work site. All messages, instructions and information relayed between confined-space entrants and outside attendants need to be sent, received and understood clearly to be effective.

## Communication challenges

Confined work sites such as manholes, storage tanks, wet wells, water tanks, pumping stations, and grit and sludge chambers present many communication challenges. The tight spaces in these environments sometimes only allow one worker to fit, which means relying on technology to communicate with co-workers above ground. Ambient noises — such as those from the respiratory protection equipment necessary to minimize a municipal worker's exposure to toxic gases — can keep workers from recognizing alarms or other warning sounds. Municipal work sites also can interfere with electronic devices, and wet environments can be hard on a lot of communication equipment.

In an emergency, your workers may also be struggling to clearly communicate while experiencing anxiety and labored breathing. Radios are popular communication systems, but their reaches in confined spaces are

limited because of electronic interference, as well as battery and signal strength and other issues. Cellphones face similar problems, and yelling, banging on a pipe or tugging on a rope isn't effective in general, let alone in an emergency.

## Hard-line systems

"Underground drain cleaning work is challenging and requires clear communication to maximize efficiency and safety," says Rick Pedley, PK Safety CEO.

Hard-line communication systems provide a clear, dependable lifeline to the surface and help ensure your confined-space entry teams get the job done and make it out safely.

The General Industry Kit from Con-Space Communications is designed to be simple, but durable, which is great for workers who will get their equipment wet, dropped in mud and pulled along corners, but who still need them to work. The throat mic straps directly around the throat and takes its sound from the vibration of the speaker's vocal cords, making the speaker understandable and clear even when wearing a respirator mask. The equipment includes a headset and an alarm button for the entrant.

The CSI-1100 Mini Modular Base unit can handle two workers and run for up to 200 continuous hours on four regular AA batteries, which means no outside power source or wires to worry about getting tangled. The system can be expanded by adding splitters that don't diminish sound quality, and the attendant's headset attaches to a mini module power supply that keeps the attendant connected when the entrant needs to relay information about a hazard or accident.

The CSI-2131 Power Talk Box offers hands-free communication for both the entrant and attendant sides of the line, which is crucial in environments where maneuvering requires the use of both hands and where a worker might need to call for help but is unable to press a button. The waterproof unit has a cable sheathed in thermal plastic cable coated to resist many oils, solvents and chemicals, and it offers a speaker harness that holds the throat mic ear speaker in place.

Safety is the priority of any device taken into an enclosed space, but a comfortable fit under a hard hat or other personal protective equipment doesn't hurt, especially when it encourages your team to wear the devices properly.

Going into a sewer or other permit-required confined space by yourself doesn't mean you should go alone, and the right communication equipment ensures you're always in touch with co-workers and in compliance. ♦



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# GET YOUR TEAM ENGAGED

There's much to be gained when managers learn how to take things off their plates and delegate

By Ken Wysocky

It may sound too good to be true, but there's actually an easy way for managers to become more productive as well as develop the skills of their direct reports, build their confidence and make them feel more engaged. Better yet, it costs absolutely nothing (except a small investment in time) and can lead to improvements in organizational productivity and innovation.

It all boils down to one small word that can spur big results: delegate.

Think about it for a minute. Entrusting employees with additional responsibilities frees up time for managers to do more strategic, big-picture thinking. At the same time, it enables employees to build their skill sets and burnish their internal corporate resumes, making them more viable candidates for promotions. Moreover, when done correctly, giving up-and-coming employees

**"Your job is not to do people's work for them, but to help them get better at doing their jobs. Not many people see their work that way. ... You need to become more of a teacher and less of a doer."**

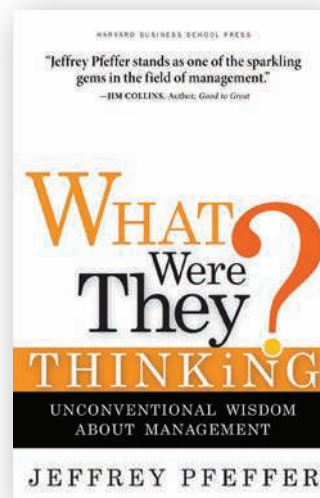
Jeffrey Pfeffer

additional responsibilities — and giving them the freedom to figure out how to achieve those tasks, without any micromanaging — often can lead to better and innovative processes and products.

"The problem with not delegating is the fact that people who can't make decisions tend to be very unmotivated," says Jeffrey Pfeffer, the Thomas D. Dee II Professor of Organizational Behavior at Stanford University's Graduate School of Business. "So without delegation, there's less employee engagement. Most people find autonomy is a positive aspect of a job.

"Moreover, delegating benefits organizations because more-engaged employees are less likely to quit their jobs," says Pfeffer, the author of *What Were They Thinking? Unconventional Wisdom About Management* and *Dying for a Paycheck: How Modern Management Harms Employee Health and Company Performance* — and *What We Can Do About It*. "Furthermore, being micro-

**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](mailto:editor@mswmag.com).



managed is one thing that predicts stress and ill-health for employees. Feeling like you have some control over your job is a very important part of living a healthy life."

## Ego is an issue

In short, delegating is a win-win-win for managers, employees and organizations. But despite all this, many managers still find it about as attractive as a *Cryptosporidium* outbreak. Why? One primary factor is ego and control issues, Pfeffer says.

"Studies show that delegating is difficult because many of us believe that every decision we make is better for having us involved in it," he says. "We like to think of ourselves as very effective, so everything we do is better if we're involved in it. It's all based on the illusion of control."

A host of other factors also may dissuade managers from delegating. For one, they may think that by the time they show someone else how to do something, they could've done it themselves. Or going back to the ego thing, they feel they can perform tasks better than anyone else.

Other times it's a trust issue; managers don't believe employees will do things correctly and fear that the employees' failure will reflect badly on their managerial skills. Or perhaps they feel threatened — that as employees gain experience and skills, they'll soon be taking aim at their managers' jobs.

## Honest assessment

So how can organizations and managers go about changing such deeply ingrained behaviors? Change never is easy, but recognizing that there's a problem, as the saying goes, is the first step toward solving it.



In that vein, managers need to stop and take an honest, unflinching look at how they operate. One clear sign that things are amiss: working insanely long hours each week. In other words, if you're too busy to delegate, you need to start making time for delegating.

Keep in mind that delegating doesn't mean asking employees to perform small tasks. Asking them to make copies or take minutes at a meeting is not a career path. In order for them to grow as employees, they need something substantive to dig into. At the same time, it should be something that they're capable of handling, yet still requires them to stretch their capabilities, experts note.

In addition, it's critical to set clear, definite goals, including specific deadlines. Moreover, it helps greatly to explain why the project or task is important *and* how it fits into an organization's overall strategies and goals. This provides context that reinforces employee buy-in. Skipping these steps only sets employees up for failure, experts say.

It's also important to ensure employees have the proper resources at hand to complete projects, as well as to touch base with them periodically to make sure things are on track. And when the task is completed, set aside some time to evaluate it — discuss what worked and what didn't and how things could be improved the next time around. This builds a sense of accountability.

### New mindset required

Above all, resist the temptation to micromanage and intervene, which totally squelches the very things delegating is supposed to engender: creating more time for managers to do higher-priority tasks and empowering employees to better themselves. "Your job is not to do people's work for them, but to help them get better at doing their jobs," Pfeffer explains. "Not many people see their work that way. ... You need to become more of a teacher and less of a doer."

In addition, managers who delegate have to acknowledge that sometimes employees won't succeed at their new responsibilities. "To help employees get smarter and spur more innovation, you have to tolerate failure," Pfeffer points out. "There is no learning without failure."

Management can help increase managers' ability to delegate, too, by increasing the number of people they supervise. While this may sound counterintuitive, Pfeffer suggests that when managers have more reports than they can reasonably supervise and micromanage, it forces them to delegate.

In the end, changing managerial styles can be a challenge. But the rewards are worth the effort. "Think about how much more fun employees' jobs become when they get to do new and more interest-

ing work," he notes. "If you do all the work, employees remain nothing but subordinates. They don't grow. And that's not a good thing."

So go ahead — take a deep, cleansing breath, leave your ego at the door and start delegating. And if you don't have time to do so, all the more reason to start. ♦

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# BACK TO OUR ROOTS

Partnership with Water Resource Center touches on NASSCO's past, present and future

By Sheila Joy

Technology makes it super simple to send a quick text, instant message or email for an immediate response and swift gratification. It has been my experience, however, that investing time in a meaningful in-person meeting provides the benefit of hearing a person's inflection, reading body language and seeing emotion behind someone's eyes, not to mention developing a real relationship.

When I took the position of NASSCO executive director last year, one of the first things I wanted to do was build a relationship with the staff of the Water Research Center in Swindon, England. My goal was to better understand our roots (NASSCO's Pipeline Assessment and Certification Program is based on the Water Research Center's Manual of Sewer Condition Classification). I also wanted to explore ways to connect with the Water Research Center and identify areas of collaboration to further NASSCO's

mission to set standards for the assessment, maintenance, and rehabilitation of underground infrastructure and assure the continued acceptance and growth of trenchless technologies.

It wasn't until I made a trip to the Water Research Center last November with Tim Vivian, the 2018-19 president of NASSCO's board of directors, that I felt real progress had been made. I attribute this to the investment Vivian and I made to meet with the Water Research Center team in-person, reminisce about our history, tour their impressive research facility, understand their culture and identify areas of mutual opportunity.

One of our takeaways from this productive meeting was to develop a collaborative work group to explore such opportunities. We look forward to building on our history with the Water Research Center to join forces and create a future that benefits our industry, and our world. ♦

**NASSCO (National Association of Sewer Service Companies)** is located at 2470 Longstone Lane, Suite M, Marriottsville, MD 21104; 410-442-7473; [www.nassco.org](http://www.nassco.org)

Sheila Joy is executive director of NASSCO. She can be reached at [director@nassco.org](mailto:director@nassco.org).

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By Craig Mandli



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The **ME 4000** from **DBO Solutions** is a fully mobile waste recovery system designed for street and hydrovac waste processing. Ideal for multiday projects or as a portable facility-based unit, it quickly and efficiently processes hydrovac, storm and street waste slurries, recovering clear filtrate water and

stackable solids. It can easily handle multiple truckloads of different material per day, making it ideal for heavy civil construction projects. Designed for ease of transportation, setup and operation, it has self-loading options, minimal short- and long-term maintenance requirements, severe-duty construction, and is ISO 9001 compliant and Department of Transportation approved. Advanced automation controls are standard, and remote operation interface options are also available. **844-432-6349; www.dbodecant.com.**

### 4) Enz USA Rotodrigill

The **Rotodrigill** nozzle from **Enz USA** has a rotating front jet for improved cutting performance. It's effective at clearing blocked or frozen pipes and moving heavy debris. It has ideal propulsion but can also be used in hydroexcavation by plugging off the thrust jets. This versatile nozzle is available in 1/2-, 3/4- and 1-inch systems. **877-362-8721; www.enzusainc.com.**

### 5) Hydra-Flex Ripsaw

The **Ripsaw** rotating turbo nozzle from **Hydra-Flex** blasts a 0-degree water stream at up to 3,200 psi while rotating at a high speed to provide an 18-degree cone of coverage. Its cone-shaped flow pattern is ideal for potholing applications. The heavy-duty, high-impact nozzles are constructed with stainless steel housings and tungsten carbide wear surfaces to withstand harsh environments and provide long life. Repair kits are available for extended life and lower operating costs. Select from traditional coating (blue) or upgrade to the heavy-duty coating (green), a formulation designed for use in extreme environments. Greater impingement allows users to complete jobs faster or use a smaller nozzle size while getting the same impact as nozzles with higher flow rates. **952-808-3640; www.hydrflexinc.com.**



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## 6) NozzTeq MONRO-JET

The **MONRO-JET** hydroexcavation nozzle from **NozzTeq** combines the power of a solid-stream pencil jet with the large coverage of a fan jet. An orbital design increases performance at a lower gallons-per-minute rate and pressures as high as 36,250 psi, allowing the operator to move faster when hydroexcavating and cleaning surfaces or sewer lines. It can be used for other types of surface cleaning such as concrete, steel, castings and large surface areas including line removal from runways. It can be modified for internal cleaning of sewers and pipes of all types. **866-620-5915; www.nozzteq.com.**

## 7) Soil Surgeon hydroexcavating tool

The **Soil Surgeon** hydroexcavating tool fits any sewer combination truck equipped with a telescoping 6- or 8-inch boom. The tool has a 1-inch water connection. The operator controls water pressure and power through truck controls. It has a 6-foot Tuff Tube with handles to guide the unit down for potholing or side to side for trenching. Six jets boring inward cut the soil, while six boring outward bring the tube down. **949-363-1401; www.soilsurgeoninc.com.**

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The **Ditch Witch HX30** vacuum excavation trailer offers a 24.8 hp Kubota diesel engine designed for performance and productivity on midsized potholing, soft-excavation or cleanup tasks. The low-profile machine reduces unit height without compromising ground clearance. It is available with a 500- or 800-gallon debris tank and in a light or heavy version. Also available are advanced optional boom designs to improve ease of use. With advanced sound-reducing technology, it creates minimal disturbance in noise-sensitive

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## 9) GapVax HV33

Designed to safely transport water and debris in urban areas, the **GapVax HV33** is shorter, smaller and more compact than its predecessor. It is 30 feet long overall on a medium-duty chassis and includes a 600-gallon water tank, 6-cubic-yard debris body, 14- to 17-foot 6-inch boom in 8 or 6 inches, 4,000 cfm power and an inverted, full-opening tailgate. **888-442-7829; www.gapvax.com.**

## 10) Presvac Systems Hydrovac

The **Presvac Systems Hydrovac** is designed for versatility and cold-weather operation with optional full compliance with DOT specifications for collection or transportation of hazardous materials. The high-vacuum blower allows extraction of all types of soils, gravel, rock, clay, water and silt material, with knockout features in the debris tank minimizing carryover. Modular filtration configured to blower size provides blower protection and minimal maintenance, according to the maker. It comes with a heavy-duty, 8-inch boom that extends up to 25 feet, with six-way hydraulic power and wireless controls for all boom functions, soft-start water pump, vacuum breaker and truck engine speed. **800-387-7763; www.presvac.com.**

## 11) Rival Hydrovac T10

The **T10** from **Rival Hydrovac** is a larger version of the initial Rival T7 unit, which has become a suitable choice for many urban contractors who are aware of the trending weight restrictions and realize the need to bring these trucks into compliance when driving on roads to disposal sites. It operates in

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the same manner as the T7, as it is fully hydraulic, eliminating the need for a transfer case; and aside from engaging one PTO, the entire truck is operated from the remote and rear panel. This unit features the same “pressure off” feature as the smaller units and has essentially the same controls. **403-550-7997; www.rivalhydrovac.com.**

### 12) Super Products Mud Dog 1200

The **Mud Dog 1200** 12-yard-debris-capacity hydroexcavator from **Super Products** has a rear-mounted boom capable of a 19- to 27-foot reach, 335-degree rotation, 45-degree upward and 25-degree downward pivot. This range of boom motion allows crews to achieve greater work area access and deeper digging without halting production to reposition the trunk. Easy-to-use ejector plate unloading technology provides fast, thorough and safe debris removal, according to the maker. A tilt-unloading feature ensures liquids in the debris tank are cleared efficiently, even when unloading in an up-slope/nose-down position. Options include the Acculevel load-sensor system for precise debris tank level measurement. **800-837-9711; www.superproductsllc.com.**

### 13) Supervac Hercules XL

At 37 feet long, the **Hercules XL** from **Supervac** is suitable for applications where weight is not as much of a concern. It can carry 18 cubic yards of debris, and it has available a payload capacity of 25,000 pounds. The 3,600-gallon debris tank is mounted as close as possible to the truck’s cab. Its 3,800 cfm, 27-inches Hg blower is more compact than its predecessors and mounted directly over the truck’s second axle. In addition, more equipment, including its 30-ton hydraulic dump hoist and 400,000 Btu boiler are compactly situated near the cab to allow for more even weight distribution. The unit’s 185 cfm air excavation compressor, Webasto diesel fuel heater,

3,000 psi high-pressure water pump, controls, aluminum toolboxes and six 250-gallon (1,500-gallon total capacity) plastic water tanks are evenly distributed along the sides of the unit, adding to the even weight distribution. **866-839-5702; www.supervac.co.**

### 14) Tornado Global Hydrovacs F4 ECOLITE

The **F4 ECOLITE** from **Tornado Global Hydrovacs** has a 12-cubic-yard mud tank and holds 1,550 gallons of freshwater. The unit is more than 7,000 pounds lighter than the company’s older models and offers more than double the payload. The boom has a 342-degree rotation and a 26-foot reach. The smaller F3 ECOLITE is a 10-cubic-yard, 1,250-gallon tandem-axle unit that also more than doubles older payload capacities. It features an 8-inch boom and a 3,800 cfm blower. **715-441-7157; www.tornadotrucks.com.**

### 15) Transway Systems Terra-Vex HV38

The **Transway Systems Terra-Vex HV38** has a 12-yard debris tank with onboard scales, which allows a driver to load the tank worry-free. It includes a large debris tank for those light loads, saving time and money, complete with a 26-foot-by-8-inch telescopic boom. It has a simple one-touch-operated hydraulic half-door with a 3,800 cfm at 27 inches Hg hydraulically driven blower. Water pressure is achieved with a hydraulically driven triplex pump, delivering 10 gpm at 3,600 psi from a 1,000-gallon HDPE baffled water tank. The water is heated with a 420,000 Btu diesel-fired burner for cold weather operation. **800-263-4508; www.transwaysystems.com.**

### 16) Vac-Con X-Cavator

The **X-Cavator** from **Vac-Con** is designed to be powerful, durable and easy to operate. It features a hydrostatic drive using the chassis engine for vacuum, creating a more efficient system that eliminates the need for PTO,

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clutch and gearbox operation. It is available with water systems up to 4,000 psi and a mobile, wireless remote-control system controlling chassis engine revolutions per minute, boom, automatic vacuum breaker, dump controls and hydraulic door locks from up to a half-mile away. The boom rotates 270 degrees. **904-284-4200; [www.vac-con.com](http://www.vac-con.com).**

### 17) Vacall AllExcavate

The **Vacall AllExcavate** hydroexcavators include AllSmartFlow smart controls that help to conserve water during high-performance jet/vac digging around utilities and waterlines or cleaning frac tanks and vessels. Single-engine efficiency helps conserve fuel and reduce emissions. It has a high-pressure water system with rheostat control to vary water volume and capacity output. A heated compartment protects the water system components against freezing, and the water tanks are made of high-quality aluminum for extra strength. Large, galvanized steel debris tanks are also available. A single control is used to open, close and lock the tailgate. It has double-cyclone filtration with a simplified design to reduce maintenance, extend performance and increase working life. Its rear-mounted boom front-loads debris. It is available with a cold-weather package. **800-382-8302; [www.vacall.com](http://www.vacall.com).**

### 18) Vector ParaDIGm

The **ParaDIGm** vacuum excavator from **Vector** is designed for utility, municipal and contractor customers involved in the installation, maintenance and repair of underground water, sewer, gas, electric and telecommunications lines. This compact, multiuse truck can dig holes with water or air; vacuum, contain and dispose of drill mud; power pneumatic, hydraulic or electrical tools; and provide transport and storage of replacement parts, equipment and tools. The truck's Park-n-Dig design minimizes the time between arriving on the job site and excavation, including the ability to dig up to 6 feet in depth without additional pipe and hose. Its air compressor powers utility tools such as jackhammers and tampers that may be used on the job. The

truck offers substantial storage space for these tools, including a long-handle toolbox. It can also tow up to 20,000 pounds. **800-627-3171; [www.vector.com](http://www.vector.com).**

### 19) Vector Technologies Mudslinger

The **Mudslinger** line of compact trailer-mounted hydroexcavation vacuums from Vac-Con, in cooperation with **Vector Technologies**, uses a 66.8 hp Kubota diesel engine with a 1,200 cfm at 16 inches Hg positive displacement blower and comes with a 535- or 845-gallon debris tank with 55-degree hydraulic dump hoist and a hydraulic door. The water system is 4 gpm at 4,000 psi with 50 inches of 3/8-inch hose and comes with a 225- or 325-gallon HDPE water tank. A 9-foot boom with 24 inches of hydraulic extension, hydraulic up/down and 270 degrees of manual rotation is also available. It is mounted on a heavy-duty welded tube steel trailer. **800-832-4010; [www.vector-vacuums.com](http://www.vector-vacuums.com).**

### 20) Westech Vac Systems Wolf

The **Wolf** noncode hydrovac truck from **Westech Vac Systems** is suitable for oil and gas customers working in extreme conditions. The debris body is positioned on the optimal spot of the chassis to ensure the payload is proportionately distributed across all axles simultaneously, maximizing legal payload for customers and improving operational efficiency. The side-mounted water tanks reduce the weight by more than 40 percent, lowering the overall cost of the truck. The 1,500-gallon capacity ensures ample water for large or remote jobs. A top-mounted, no-touch water fill system is easily accessible from the passenger side of the vehicle. The debris body is lifted using a telescoping, dual-acting hydraulic cylinder capable of 36,000 pounds of force. When fully extended, the debris body exceeds a 45-degree dump angle for fast and efficient off-loading. To help the off-loading process, a heavy-duty, hydraulically powered tank vibrator is mounted to the belly of the debris body. **780-955-3030; [www.westechvac.com](http://www.westechvac.com).**

(continued)





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21)



22)



24)



25)



23)



### JET/VAC COMBINATION TRUCKS/TRAILERS

#### 21) Bucher Municipal RECYcler 315

The **Bucher Municipal RECYcler 315** sewer cleaning unit offers a fully continuous water recycling system, automatic fuel-saving technology and easy maintenance. Its five-step recycling process protects the tank, pumps and sewer lines, giving units a long operating life and a high residual value. It comes with an 8- or 15-cubic-yard tank, and a winter option allows for operation down to 20 degrees below zero. **312-705-3818; [www.buchermunicipal.us](http://www.buchermunicipal.us).**

#### 22) Cusco Sewer Jetter

The **Sewer Jetter** from **Cusco** can help perform major cleanups by excavating debris with a 26-foot boom reach and a 270-degree boom rotation. Outfitted with quality components and reverse engineered for optimal weight and payload with a superior operator control system, the unit is designed for simple regular maintenance and features durable and uncomplicated systems to reduce repairs and downtime. It can be paired with a Cusco SJX hydro-excavator to provide municipalities and contractors a powerful option for handling sewer and waterline maintenance and digging new lines with one piece of equipment. Options include various tank and chassis sizes and can be modified based on customer specifications. **800-490-3541; [www.wastequip-cusco.com](http://www.wastequip-cusco.com).**

#### 23) Kaiser Premier AquaStar

The **AquaStar** fully featured recycler from **Kaiser Premier** includes a Kaiser KDU single-piston jetting pump that delivers up to 132 gpm of water with pressure up to 2,900 psi for large-diameter pipe applications. The combination rear-mounted jetting hose/suction boom allows optimal positioning at manholes for quick, efficient and safe cleaning operations requiring only one operator. The boom hose reaches 35 feet deep without any extension tubes, saving both setup/tear-down time. Intelligent controls optimize operational speeds, resulting in lower fuel consumption and maximized

fuel cost savings. The ROTOMAX system is mounted inside a 12.8-cubic-yard stainless steel debris tank that holds spoils and serves as a settling tank. No exterior cyclones or microcyclones on the exterior make this self-cleaning system easy to maintain. The full-feature radio remote control allows free movement around the vehicle while a full-color LCD delivers real-time performance parameters. KAISERteleservice allows for remote diagnostics and support from trained technicians. **970-542-1975; [www.kaiserpremier.com](http://www.kaiserpremier.com).**

#### 24) Sewer Equipment Model 900 ECO

The **Model 900 ECO** from **Sewer Equipment** is available in 6-, 9-, 12- or 15-yard debris capacities, equipped with Duraprolene water tanks carrying 900 to 2,000 gallons of onboard water. Its Hydro Drive powertrain system eliminates the need for a transfer case. Both single-piston and triplex pump options are available at 55 to 80 gpm at 2,000 to 3,000 psi with a 4,400 cfm blower and 18 inches Hg, built on an eco-friendly platform that provides greater fuel efficiency and offers noise reduction. **888-477-7611; [www.sewerequipment.com](http://www.sewerequipment.com).**

### PUMP

#### 25) Dynablast Pratissoli Pumps KT28ASPF

The **Pratissoli Pumps KT28ASPF** high-pressure water pump, distributed by **Dynablast**, is ideal for hydroexcavating. It offers 18.4 gpm, 2,900 psi, 1,450 rpm and a 35 hp power end. It is available with a T13 female spline shaft and SAE two-/four-bolt flange for direct mounting to the hydraulic motor. Reducing the pump speed to lower water flow for hydrovac use can result in increased pump life and reduced water bypass. It has a self-lubricating design, with no oiler kit or weekly oiling required. The manifold is made from nickel-coated spherical cast iron for protection from cavitation. Its symmetrical aluminum crankcase makes it easy to reverse shaft the pump, and internal fins provide cooling to lower oil temperature. It has tapered roller bearing for improved lateral loading. Two bore ceramic plungers provide thicker ceramic on the water end to prevent from thermal shock. **905-867-4642; [www.dynablast.ca](http://www.dynablast.ca).** ♦



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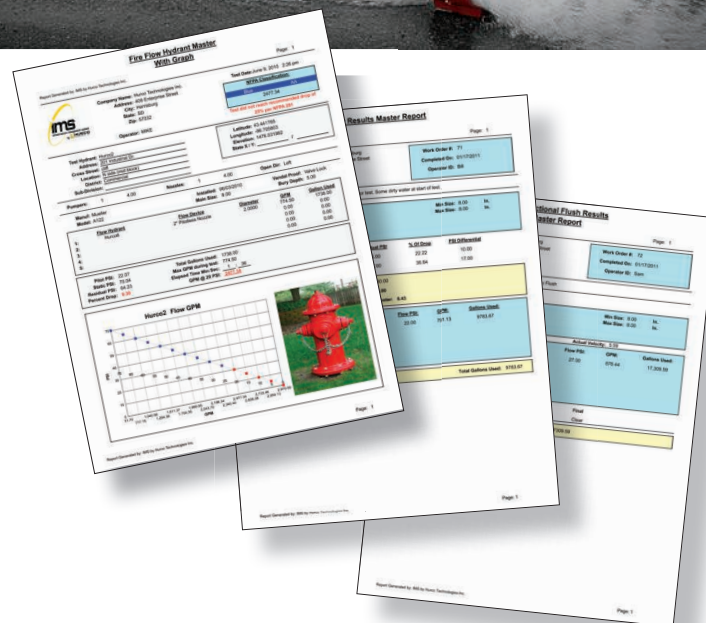
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# Product Spotlight

## Diagnostic kit speeds up inspection troubleshooting

By Craig Mandli

CUES has developed a pipeline inspection tool designed to significantly reduce unplanned downtime. The CUES REDI (Remote Evaluation Diagnostic Inspection) Kit is a pipeline inspection troubleshooting kit designed to help diagnose electrical issues, allowing for quicker and more accurate troubleshooting and repairs of problems while in the field.

The kit includes a high-resolution web camera that allows for two-way video conferencing with CUES technicians, parts specialists and engineers to expedite troubleshooting, enhance parts identification and provide for specialized support by the specific engineers, who designed the systems. A diagnostic test box provides easy access to the TV cable conductors via test points. This makes taking voltage readings much safer and easier, and it can be done with the camera and transporter attached for a more accurate reading while under load. The diagnostic test box also contains a built-in minicamera, which can be used to send video back through the TV cable and truck if the technician believes they may have a problem with the camera. Having this backup camera helps to eliminate the need to locate an alternate mainline camera for video path troubleshooting.

"The REDI Kit makes taking voltage tests very easy," says Chris Graybill, CUES customer service manager. "It also allows you to do that while your product is hooked to the end of the cable, so those tests would actually be



under load. So any problems within a transport or camera that would be pulling that voltage down you'd be able to detect easily."

The unit's footage test box can be substituted for a footage head encoder, on both newer and older CUES reels. Test points are also provided to allow the user to verify that operating voltage is present at the encoder.

"Whether you have a newer or older reel, you can substitute the footage test box for the existing encoder on your inspection truck, so it will quickly eliminate whether that is your problem or not," Graybill says.

A USB diagnostic tool is included to help troubleshoot computer issues relating to the 5-volt power supply and any USB peripherals that are connected to the computer. A user-friendly multimeter is provided. CUES technicians are very familiar with its operation and can assist, as needed. Video cables and adapters are also included, as they are sometimes helpful during troubleshooting. **800-327-7791; [www.cuesinc.com](http://www.cuesinc.com).**



## Reelcraft Industries Series LG cord reels

Reelcraft Industries' lightweight and compact Series LG cord reels are constructed from a durable, impact-resistant composite material. Three new models have been added to the medium-duty line of cord reels with two new cord endings. The new power cord reel option features circuit breaker-protected, quad-grounded NEMA5-15 outlets with an LED power-on indicator light. The quad outlet reel is available with 65 feet of 12/3 cord or 75 feet of 14/3 cord. The new light cord reel option features a 1,300-lumen LED light with bright COB illumination, a grounded 12-amp outlet and an on/off switch on the handle. The LED reel model is supplied with 50 feet of 14/3 cord. All three new Series LG models are ETL listed. **800-444-3134; [www.reelcraft.com](http://www.reelcraft.com).**

## Exact Pipe Tools PipeCut Pro Series

Exact Pipe Tools' portable pipe cutting Pro Series 280 and 360 models include a new 120-volt motor able to cut pipe wall thicknesses of 1/2 inch in steel and up to 2 inches in plastics. The models also have a laser indicator light for precision cutting, an improved adjustment mechanism for straight cutting and an overload protection traffic light system. The tools are ideal for all on-site pipe cutting applications where safety, accuracy of cut and easy-to-use portable equipment is essential. **844-392-2800; [www.exacttools.com](http://www.exacttools.com).**



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## McElroy DataLogger 6 software

The DataLogger 6 from McElroy offers expanded data collection capabilities and new features with a free software update. Version 1.09 includes built-in options to record fusion information from manually operated machines. Key elements that can be recorded include operator, equipment, material, location, pictures, notes and fusion standards. A new FusionGuide display makes it easier to interpret drag pressure, which, along with bead size, is key to the correct heat soak. Users can zoom into multiple portions of the graph, which makes it easier to confirm that the fusion was done properly during each stage of the process. Also included is the ability to retrieve joint reports that are stored in the McElroy Vault no matter which DataLogger device was used to upload. **918-836-8611; [www.mcelroy.com](http://www.mcelroy.com).**



## Plast-O-Matic Valves Z-Cut ball valves

Linear flow-rate control balls from Plast-O-Matic Valves have metering or electronic positioning to provide precise process control. The Z-Cut ball design can be customized to provide virtually any required flow performance. Sizes are available from 3/8- to 4-inch and come in PVC, CPVC, natural polypropylene and PVDF. The modulating digital positioner offers autocalibrating and self-resetting functions. **973-256-3000; [www.plastomatic.com](http://www.plastomatic.com).**



## Felling Trailers IT-I Series trailers

Felling Trailers IT-I Series model line has a refined design that incorporates additional standard features, structural strength and ease of operator use. The new IT-I design will be seen on Felling Trailers' 2020 model year IT-I tilt trailers. Advanced standard specifications include a redesigned hitch area with a more user-friendly, integrated nose plate; additional structural integrity for cylinder crossmembers; dual stop, turn and taillights located on the rear of the fenders that have been incorporated into the standard design; D-rings that were once located on the topside rail behind the fender on the rear of the tilt deck that are now located on the side of the trailer bed; and an operator-friendly tilt-deck latch design. **800-245-2809; [www.feling.com](http://www.felling.com).** ♦





## Perma-Liner Industries celebrates 20 years of manufacturing

Perma-Liner Industries is celebrating 20 years of manufacturing in the trenchless pipeline rehabilitation industry. Founded in 1999 by Jerry D'Hulster, the company was the first relining company to achieve NSF approval, which allowed for CIPP to be used on the plumbing side for plumbing code approvals. The business was acquired in 2013 by Triwater Holdings, a Chicago-based water company, and is now a Triwater's Waterline Renewal Technologies division, which also includes the brands LMK Technologies and AP/M Permaform.

## Sauereisen promotes Golla to vice president of sales

Sauereisen announced the promotion of Mark Golla to vice president of sales. In his new role, Golla will continue to oversee the promotion of Sauereisen, as well as work with the executive team to develop strategies to move the company forward. He has served as sales director for Sauereisen since 2014. He previously held positions at Saint-Gobain Abrasives, Saint-Gobain Ceramics and Plastics, Schott Glass Technologies, and Harbison Walker Refractories.



**Mark Golla**

## Super Products to build new vacuum trucks facility

Alamo Group announced that it has plans to build a new \$15 million facility for its Super Products vacuum trucks operation. The facility will be located

in the village of Mukwonago, Wisconsin, and will allow the company to consolidate and expand current production, which operates out of several facilities in the greater Milwaukee area. The plant is anticipated to commence operations in the first quarter of 2020.

The facility will allow Super Products to consolidate its manufacturing and customer support operations into a single, highly efficient location. It will also enable Super Products to bring in operations that are currently outsourced due to capacity limitations. The site also offers the potential to expand operations to meet future needs.

In 2018, Super Products opened two new rental locations in Savannah, Georgia, and Corpus Christi, Texas, and now operates eight rental locations in seven states. The additional capacity provided by the larger facility will allow Super Products to continue its growth in the coming years.

## Envirosight signs Jet Vac Equipment as sales partner

Envirosight announced it has partnered with Jet Vac Equipment to provide more extensive sales and service coverage across New Jersey and Delaware. Jet Vac Equipment will work in conjunction with Bruce Kosensky, longtime Envirosight New Jersey direct sales manager, to maintain continuity with existing accounts and develop new ones.

"We've watched what Envirosight has been able to accomplish here in New Jersey and in the broader sewer inspection market," says Adam Emusov, vice president of sales at Jet Vac Equipment. "We're excited to join the team and to be part of the next chapter of growth."

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## Cityworks opens regional office in Indiana

Cityworks-Azteca announced the opening of a regional office in Carmel, Indiana. The office, which is the company's first technical support location in the Indianapolis metro area, is positioned to support Cityworks clients in the Eastern U.S. and international locations.

## Vortex promotes Graham to vice president of sales

Vortex announced the promotion of Ryan Graham to vice president of sales. In his new role, he will assume all sales and marketing responsibilities related to managing the growth of Vortex's extensive line of service offerings for trenchless infrastructure repair.



Ryan Graham

## Vac-Con announces new distribution agreement for HD video nozzle

Vac-Con announced that it has entered an agreement with Sewer Robotics to be the exclusive North American distributor of the C70 HD video cleaning nozzle. The nozzle is designed to jet pipelines ranging from 6 to 40 inches and is available through the Vac-Con dealer network.

## Seeq adds to lead analytics engineering team

Seeq announced the addition of Dr. Lisa Graham, a registered professional engineer with more than 20 years' experience in data analytics for phar-

maceutical and chemical industries. Graham will manage the analytics engineering team, which works with customers on training, use cases and operationalizing analytics strategies.

## Snyder appointed Blue-White Industries sales manager

Blue-White Industries announced the appointment of Andrew Snyder to the position of sales manager. After earning a Bachelor of Science degree in mechanical engineering from the University of California, Irvine in 2014, Snyder joined Blue-White Industries as a sales engineer. During his employment with the company, he has taken an active role in assisting customers with technical questions and concerns, calling on customers personally and visiting installation sites.



Andrew Snyder

## Pipe Lining Supply offers Quik-Shot system exchange program

Pipe Lining Supply's Quik-Shot lateral lining inversion unit now features an improved nozzle design that allows the CIPP lateral lining material to flow through with ease, using the venturi process. With the new design, Pipe Lining Supply now offers a retrofit exchange program to rework any nozzles from existing customers. ♦



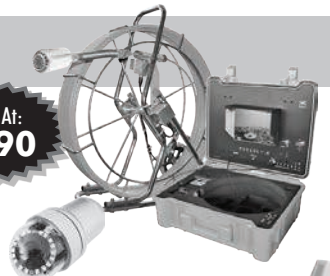
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## PEOPLE/AWARDS

**Gibbs & Olson** (Washington) hired T.J. Griggs as a project engineer. Among his projects are analysis and design of stormwater detention and treatment systems.

The **town of Batavia** received \$255,172 for its Bigelow Creek Headwaters Improvement Project from the New York State Department of Environmental Conservation's Climate Smart Communities Grants Program. The town is planning to install various stormwater management practices such as check dams, creek bed enhancements, native vegetation and a stormwater treatment pond within the Bigelow Creek watershed as part of the improvement project.

The **village of Sherman** received \$18,000 from the New York State Department of Environmental Conservation's Climate Smart Communities Grants Program. The funds will be used in part to incorporate policies and actions to protect stormwater infrastructure.

The **city of Somerville** (Massachusetts) received a \$500,000 MassWorks Infrastructure Program grant for a project that will modernize a 140-year-old sewer system and enable separated stormwater and sewer service to support the redevelopment of Boynton Yards.

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The **Oak Brook Park District's Central Park** received the Outstanding Facility and Park Award from the Illinois Park and Recreation Association. The district received the honor for renovations made during the Central Park Improvement Project. The expanded and accessible permeable paver lot and bioswale adjacent to the new playground provided enough compensatory stormwater storage that additional retention ponds were not required. ♦

## CALENDAR

### April 29-May 2

Center for Watershed Protection National Watershed and Stormwater Conference, Francis Marion Hotel, Charleston, South Carolina. Visit [www.cwp.org](http://www.cwp.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, Florida. Visit [www.wef.org](http://www.wef.org).

### May 8-10

Ohio Stormwater Conference, Hyatt Place-Cincinnati/Sharonville Convention Center, Cincinnati. Visit [www.ohstormwaterconference.com](http://www.ohstormwaterconference.com).

### May 19-22

American Public Works Association North American Snow Conference, Salt Lake City. Visit [www.apwa.net](http://www.apwa.net).

### June 9-12

American Water Works Association ACE19 Annual Conference & Exposition, Denver. Visit [www.awwa.org](http://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](http://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](http://www.asabe.org).

### Aug. 18-22

StormCon 2019, Hyatt Regency hotel, Atlanta. Visit [www.stormcon.com](http://www.stormcon.com).

### Sept. 8-11

American Public Works Association Public Works Expo (PWX), Washington State Convention Center, Seattle. Visit [www.apwa.net](http://www.apwa.net).

### Sept. 9-11

National Rural Water Association WaterPro Conference, Nashville, Tennessee. Visit [www.nrwa.org](http://www.nrwa.org).

### Oct. 9-13

American Society of Civil Engineers Annual Conference, Miami. Visit [www.asce.org](http://www.asce.org).

### Oct. 20-23

American Water Works Association Water Infrastructure Conference & Exposition, Hyatt Regency at The Arch hotel, St. Louis. Visit [www.awwa.org](http://www.awwa.org).

### Nov. 3-7

American Water Resources Association Annual Water Resources Conference, Sheraton Hotel, Salt Lake City. Visit [www.awra.org](http://www.awra.org).

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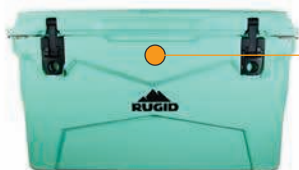


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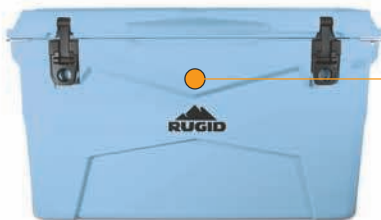


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