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2018 & 2019

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Industry Forecast

Expert predictions for 2019 focus on contaminants old & new 8

Conservation

Membrane capacitive deionization as a water-efficient treatment option

By Bryan Brister

When companies are looking for a water treatment solution, they can rely on a variety of options to get the job done. For many years, they deployed conventional and conservative systems that were not necessarily geared toward water conservation. With new regulations by state and local governments limiting companies' ability to use and reuse water, the need for innovation in the water treatment industry is at its peak. Membrane capacitive deionization, a viable competitor to traditional water treatment technologies such as reverse osmosis (RO), water softeners and electro-dialysis reversal (ED/EDR), is one recent innovation.

Tunable Technology

Membrane capacitive deionization removes salts or total dissolved solids (TDS) from water sources with minimal pretreatment requirements. It eliminates dissolved salts and other minerals via direct current, or electro-deionization, where oppositely charged salt ions are attracted to electrodes, leaving pure water flowing out of the cells in a two-step process.

A major difference between this technology and traditional systems, such as RO, is its tunability. Customers can choose the level of dissolved salts that are removed. Not all applications require the same removal rate, which eliminates any remineralization needed from using traditional desalination and softening technologies.

Voltea, the owner of all defining patents on the use of ion exchange membranes within capacitive deionization devices, has prompted the commercialization and growth of membrane capacitive deionization (CapDI), and has systems operating on five continents.

Principles of CapDI

In step one of the purification process, feedwater passes between oppositely charged electrodes that electrostatically remove dissolved ions. Ion exchange membranes are coated onto the surface of these electrodes, allowing only oppositely charged ions to pass through, leaving pure water flowing out of the cell. Once the electrodes are fully saturated with hardness/salt ions, the removal efficiency drops and step two of the process, known as regeneration, begins and only requires a polarity flip.

During regeneration, feedwater flushes through the cell at a lower flow rate while electrode polarity is reversed, eliminating the need for chemical

Conscious

or salt regeneration. Saturated ions are rejected from the electrode surface, concentrated in the flow channel and flushed from the cell before the cycle is repeated. Ion exchange membranes and coatings prevent these ions from jumping to the opposite side during the regeneration step.

The semi-batch process of purification and regeneration takes place within a few minutes, with purification occurring for about two minutes, then flipping to regeneration for another minute to a minute and a half at a much lower flow rate. This semi-batch operation enables a higher water recovery that traditional water treatment technologies cannot deliver without significant engineering design complexity.

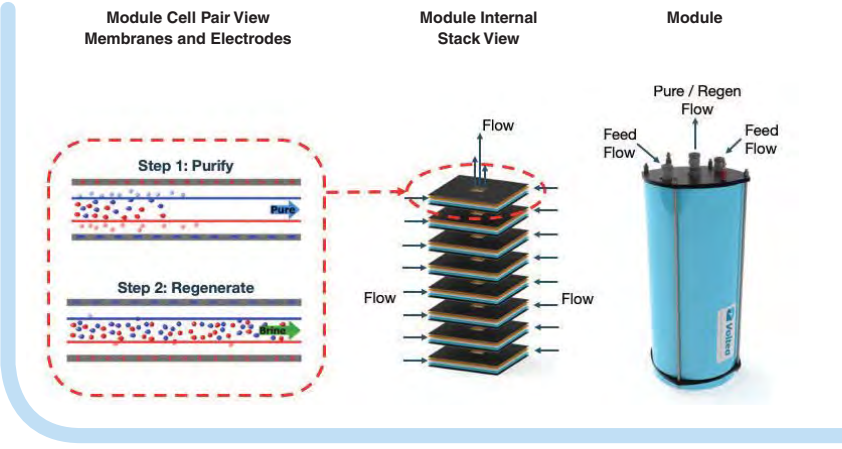
This two-step process is performed within a CapDI module, which houses a number of electrode stacks that depends on the size of the module and the flow rate required of the system as a whole. These modules make up a Voltea system, with modular build sizing. Depending on the flow requirements, the system can be sized to meet the customer's needs. An industrial series system can accompany 1 to 48 modules in a single skid. This format allows for growth and any modifications.

Traditional Technology Challenges

Traditional water treatment technologies can complicate efforts to reduce water use and the level of salts in the water. Typical water softeners require the removal of hard salts, such as calcium, magnesium and carbonates, and replacing them with two times the amount of soft salts, such as sodium, chloride and potassium. This means wastewater will have a larger volume of salts that were not naturally in the water source. That is a problem in areas where there have been restrictions and bans on water softeners due to the level of soft salts they release back into municipal water sources.

When considering an RO system for water treatment needs, a heavy amount of pressure is required to force pure water through a membrane, thereby removing TDS. This method requires more power, and some applications require a water softener placed before the RO to remove hard salts that might otherwise plug the RO membranes, or require significant anti-scalant chemicals to prevent precipitation inside the RO.

ED/EDR has the most similarities to membrane capacitive deionization in that it uses an electrical current to remove TDS and other hardness minerals from the water source. A major difference, however, is the distance between the two electrodes, which can be as much as 4 ft. With such a large distance between electrode surfaces, up to 600 VDC are required to create enough of an electrical potential difference to effectively remove dissolved salts. This distance measured within a CapDI cell is between 100 to 180 µm. This smaller gap allows as little as 0.2 VDC to create enough of an electrical potential difference to effectively remove dissolved salts, minimizing the power required.



Membrane capacitive deionization is a two-step process that occurs within a module.

Application Positioning

CapDI began as a means to tunably remove TDS and other dissolved minerals from water specifically in consumer appliances, but became useful in commercial and industrial water purification.

In commercial laundry operations, removing TDS from water ensures colors and whites stay their brightest. For traditional desalination technologies, this process involves cooling laundry water before desalination. CapDI can purify high-temperature water, removing the cooling steps.

The system also is viable for purifying feedwater for cooling towers due to its tunability feature. Overly pure water can strip ions from metal pipes and accelerate corrosion in valuable cooling equipment. With CapDI, customers can choose the amount of TDS (or electrical conductivity) removal required for their application without removing so much salt that the water becomes corrosive.

Conservative water treatment options are being challenged by viable purification methods. While there still are challenges to abide by new regulations and be environmentally responsible, the addition of new technologies and purification options can propel the industry forward. **WQP**

Bryan Brister is the CEO of Voltea. Brister can be reached at bryan.brister@voltea.com or 469.620.0133.

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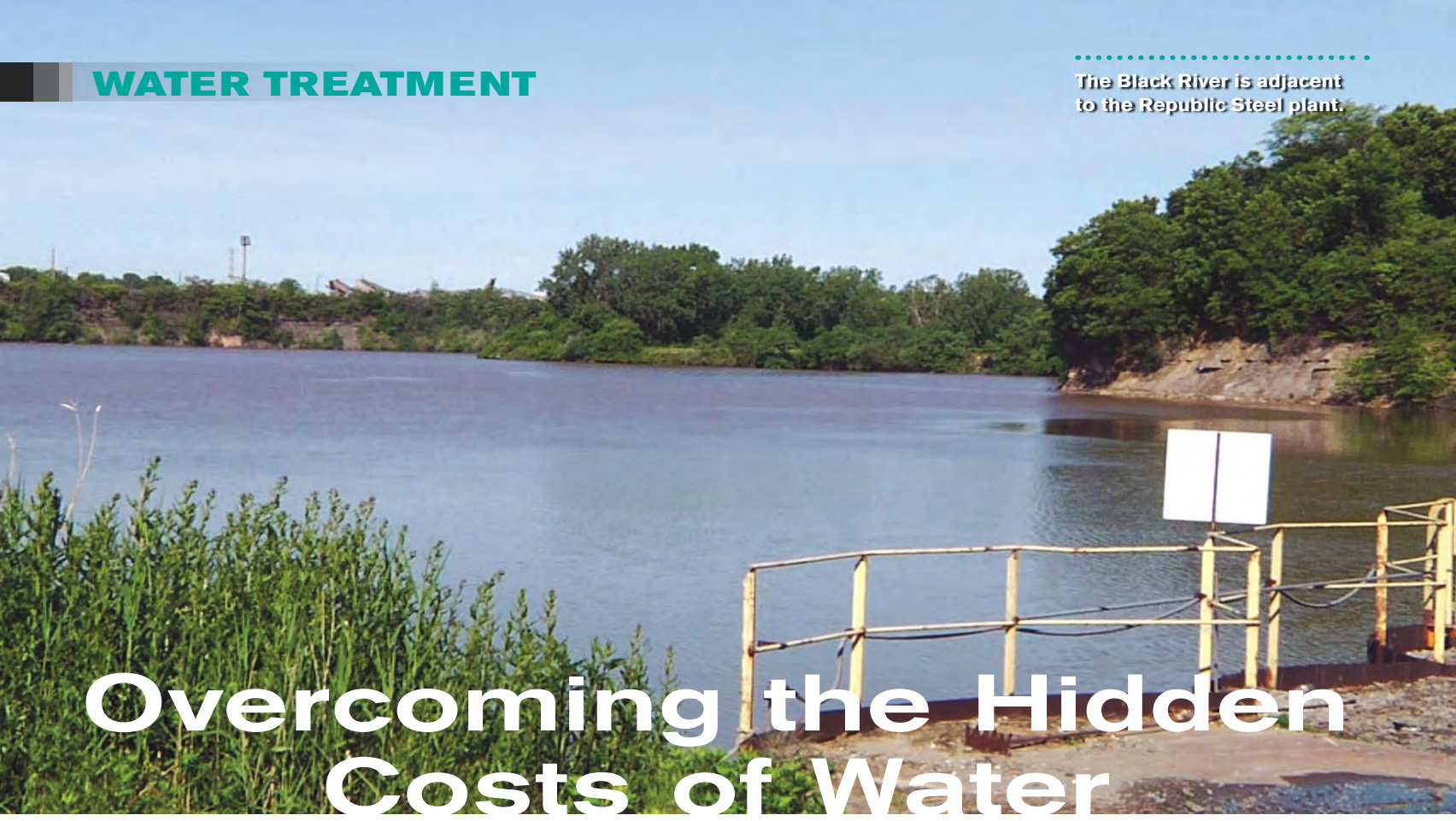


The Black River is adjacent to the Republic Steel plant.

Overcoming the Hidden Costs of Water

A steel plant had no choice but to use river water for its cooling towers. Adding electrodeionization water treatment equipment made it possible.

Water is an expensive resource for industrial companies, and it can be especially so for those that rely on cooling towers as a part of the manufacturing process. Cooling towers use a large amount of water on a consistent basis and are subject to scaling and corrosion issues. When the equipment is not maintained properly, an even greater amount of water can be used — and sometimes wasted.

Cooling towers reject heat through the natural process of evaporation, providing cooled water. Depending on the source water, water can contain natural ions such as calcium, chloride and sulfate. Due to evaporative losses, the water remaining in the cooling tower becomes concentrated with these dissolved solids, which contribute to scaling and corrosion. This buildup can affect overall performance and even shorten the lifespan of equipment.

Traditional methods of scale and corrosion control involve dosing chemicals or blowdown. The latter is the the act of discharging a portion of the cooling tower water that has a high level of total dissolved solids (TDS). This operation can result in high volumes of water and chemicals being discharged into the environment. The discharge of this water often requires permitting in order to meet local, municipal regulations if the effluent is being emitted back into the environment or some other locally sourced water system. In many communities, regulations have been passed that require companies to keep local water systems in balance.

The quality of the water introduced to the cooling tower system is key to process efficiency and the frequency of preventive maintenance intervals.

Nearby River Provides Low Quality Water

For facilities contemplating using cooling towers, the cost rises further when the water source has extreme fluctuations in quality.

Such was the case for a steelmaker in Lorrain, Ohio, that had to rely on the nearby Black River for its water. Traditional water filtration methods were considered, but they were deemed too expensive and unlikely to be effective. Yet, water treatment technology was required: The steel mill had recently installed a gasification system on-site at its 600-acre facility. The gasification system required the use of a cooling tower for operation. The cooling tower was not able to be fed by municipal feedwater due to the distance of the main water line from the gasification system.

The steelmaker solicited estimates to install a new water pipe connecting the city water mains to the new cooling

Voltea personnel observe the cooling towers on-site at Republic Steel.

tower and gasification system. The estimates were in excess of $1.2 million. Due to the high cost of building the water pipe from the municipality, the mill decided to consider other options.

Given the location of the mill, the local Black River became the only feasible water source. Raw water from the Black River, however, would require additional treatment before it could be suitable for use as a feedwater source to the cooling tower.

"Water quality is very important. If the water is dirty, it's going to plate out in our coolers," a steel mill official said. "If that happens, we're going to plug up, and we're going to be down, which means lost production and a lot of money."

Initially, the steel plant investigated water treatment methods such as reverse osmosis (RO). The traditional methods the steelmaker investigated required pretreatment and unavoidable, ongoing operating expenses due to the heavy level of treatment needed. Moreover, due to the chemicals required to keep the equipment operational, special environmental permitting was required from the Ohio's Department of Environmental Quality.

As an alternative, the steelmaker investigated electrodeionization using membrane capacitive deionization technology, manufactured by Voltea.

"CapDI [as Voltea calls it] was a particularly attractive solution due to the relatively simple pretreatment requirements as well as the fact that no special permitting was necessary," says Bryan Brister, CEO of Voltea. "The technology does not use chemicals in order to operate."

According to the company, membrane capacitive deionization removes total dissolved solids (TDS) from water sources while requiring minimal pretreatment. The technology eliminates dissolved salts and other minerals via DC current, or electrodeionization, where oppositely charged salt ions are attracted to electrodes. Pure water flows from the cells in a two-step process of purification and regeneration.

"A major difference between this technology and traditional systems like RO is its tunability feature. This means users can choose the level of dissolved salts that are removed, meaning salt removal is tunable," Brister says. He adds that not all applications require the same removal rate. The "tunability" feature helps prevent the re-mineralization that might be needed when using desalination and softening technologies.

Lowering the Environmental Impact

Reasons cited for the steel mill selecting Voltea's membrane capacitive deionization technology include:

- It required little pretreatment.
- It offered lower expected energy consumption.
- It required minimal intervention.
- It did not require special permitting.

In addition, the forecasted operational costs included with the assessment were lower than any of

Voltea CEO Bryan Brister and Tim Fitzgerald, a distributor of the electrodeionization technology, work on-site at Republic Steel in Lorain, Ohio.

TABLE 1. Water Quality*

Parameter	Avg. Black River	Requirements	Product Water
Chloride (ppm)	98.5	<50	22.5
Sulfate (ppm)	97.5	<50	32.5
Phosphate (ppm)	0.3	<0.2	0.1
Conductivity (µS/cm)	800.0	N/A	305.0
Hardness (ppm as $CaCO_3$)	132.5	N/A	29.2

**Test data independently provided by CWM Environment Inc.*

the other desalination technologies evaluated, so the mill added electrodeionization.

According to Brister, with membrane capacitive deionization technology, soft salts or chemicals do not need to be added to the system to replace the hard salts that were removed. This allows the same salinity and mineral level that were in the original water source to be discharged without additional, higher salt levels. Water softeners where hard salts are replaced by soft salts have been banned in some municipalities, especially those struck by drought.

The steelmaker's need for high quality water, as measured by the lowest controlled TDS level, led to its selection and use of the Voltea technology, says Brister.

Quantifiable Results

Before installation, average chloride, sulfate and phosphate levels in the Black River feedwater were significantly above the targets set by the cooling tower manufacturer. Desalination of the

Josh Summers, a field service engineer, manages the control panel of the industrial water treatment system at Republic Steel.

river water was thus required to make it suitable as a feed source to the cooling tower. As a result, the membrane capacitive deionization system was set to a fixed ion removal rate. This allowed it to meet the water-quality salinity requirements needed by the steel mill and cooling tower manufacturer.

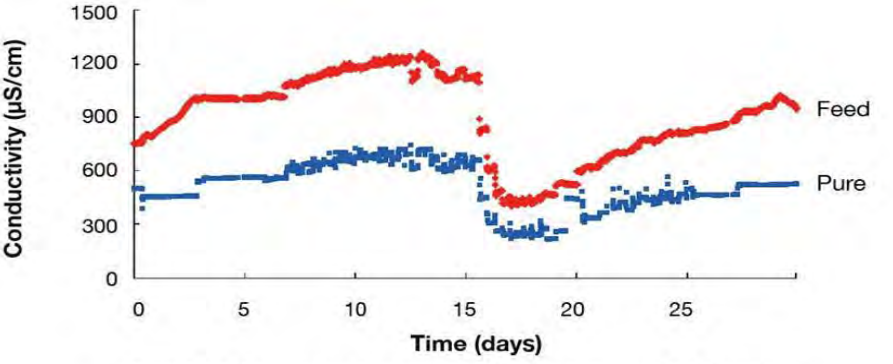
Once the membrane capacitive deionization technology was installed, the salinity level of the feedwater to the cooling tower met the requirements of the manufacturer. Among the data, the companies reported:

- Chloride ions in the treated water decreased by 77 percent.
- The concentration of sulfate and phosphate ions was reduced by 67 percent.
- Hardness and overall conductivity were reduced by 78 percent and 62 percent, respectively.

Table 1 shows the average mineral and salinity levels of the Black River without treatment. It also shows the target levels for each criterion in the cooling tower feedwater, and the actual purified product water from the membrane capacitive deionization system.

Implementation of dynamic control on the water treatment system improved the overall operation, according to Brister. This allowed it to constantly monitor and adjust performance based on real-world fluctuations in water quality. As a result, a constant water quality is delivered in the purified water regardless of variations in the feedwater coming into the membrane capacitive deionization system. One month of continuously monitored data is shown in figure 1.

FIGURE 1. System Conductivity



Feed and pure water conductivity treated by CapDI

In conclusion, the Black River — previously deemed unfit for cooling tower applications using desalination technologies — became a reliable feedwater source following the implementation of electrodeionization technology. The technology also allowed the reduction of chemicals, water consumption and wastewater. The chemical-free electrodeionization technology enabled the site to discharge the concentrated effluent of the system directly into the river without having to secure an additional site permit for disposal.

Helping the Black River remain a balanced, natural water source made electrodeionization technology a sustainable option for this cooling tower water purification. **PC**

To learn more about electrodeionization technology from Voltea, Farmer's Branch, Texas, call 469-620-0133 or visit www.voltea.com.

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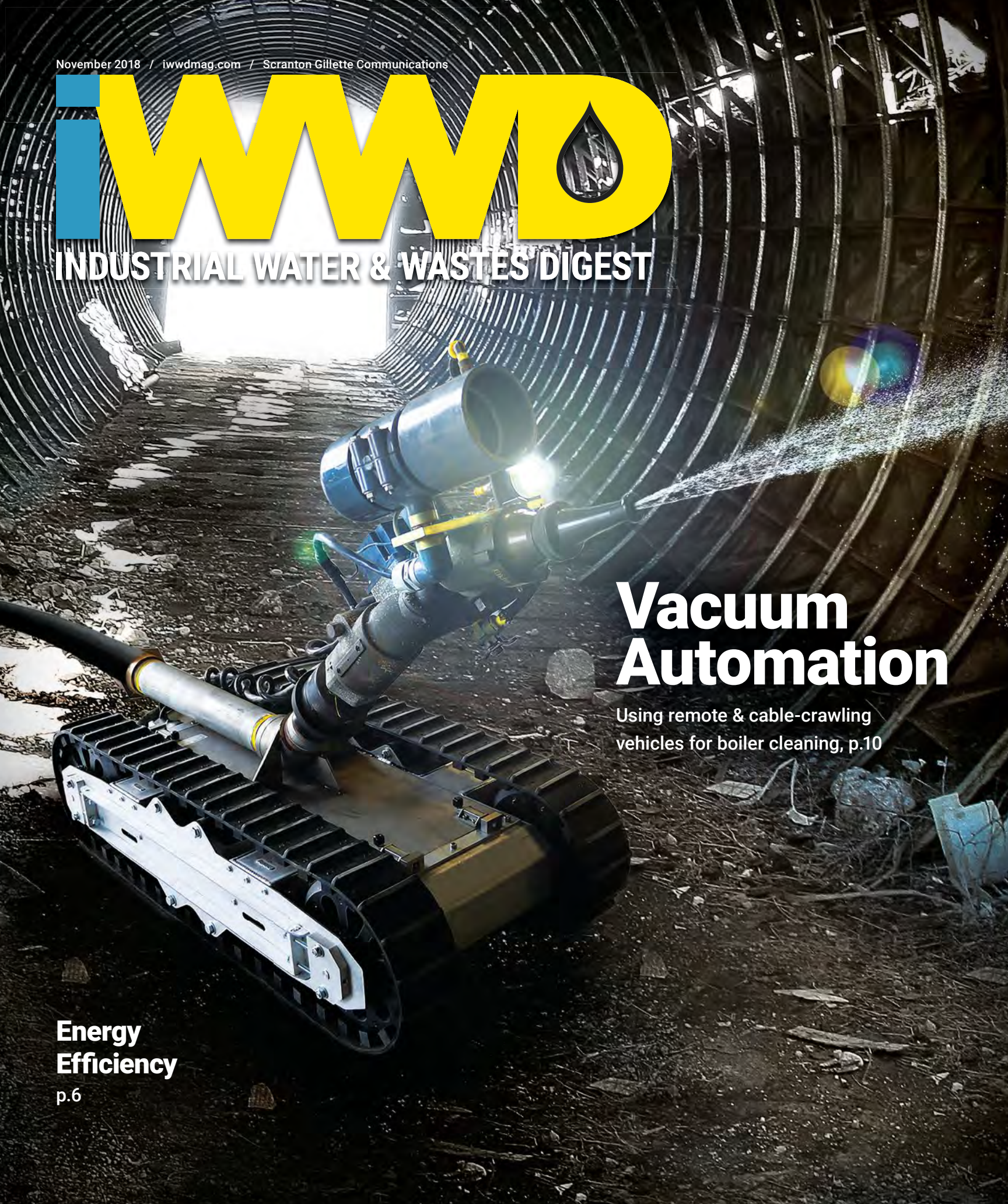
INDUSTRIAL WATER & WASTES DIGEST



Vacuum Automation

Using remote & cable-crawling vehicles for boiler cleaning, p.10

Energy Efficiency

p.6

Towers That Cool

Steel mill discovers non-traditional treatment technology to filter its only feasible water source

By Bryan Brister

The water industry is changing due to scarcity issues and new regulations, and consequently, many commercial and industrial applications that depend on water for operations are having to adapt.

Water is a hidden expense of industrial sites and can contribute significantly to operational costs. Many applications within the industrial sector rely heavily on water for their daily operations, and businesses are greatly affected by these changes.

Cooling towers are among the heaviest users of water in industrial and commercial applications, and most businesses and operators do not realize how important high-quality water is to protecting these valuable pieces of equipment

Controlling Scaling & Corrosion

Cooling towers are used to reject heat through the natural process of evaporation, providing cooled water across a broad range of applications. The water contains natural ions such as calcium, bicarbonate, chloride and sulfate. The water remaining in the cooling tower becomes concentrated with these dissolved solids that often lead to scaling and corrosion. This buildup can affect overall performance and even shorten the life span of equipment.

Traditional methods of scale and corrosion control involve dosing chemicals and blowdown—the act of discharging water at a high total dissolved solids (TDS) level. This operation results in high volumes of water and chemicals being discharged back into the environment. The discharge of this water will require permitting to meet local municipal regulations if the effluent is being emitted into the environment or some other locally sourced water system.

The quality of the water introduced to the cooling tower system is key to the efficiency of this process and the frequency of preventive maintenance intervals.

Steel Mill Faces High Costs & Environmental Regulations

A steel mill located in Lorain, Ohio, recently installed a new gasification system on site at its 600-acre facility along the Black River, which required the use of a cooling tower for operation. The problem was that this cooling tower was not able to be fed by municipal feedwater due to the extreme distance of the main water line from the gasification system.

The quoted cost to this mill to build a water pipe connecting city mains to the new cooling tower and gasification system was in excess of $1.2 million. The mill decided to consider other options.

Given the location of the steel mill, the local Black River became the only feasible water source for the cooling needs of this new gasification system. Raw river water from the Black River would require additional treatment before it could be suitable as a feedwater source to the cooling tower.

Producing Quality Water With Electro-Deionization

Traditional water treatment methods were investigated as options for the treatment of the river water, but they required expensive pretreatment and unavoidable ongoing high operating expenses due to the heavy level of treatment needed. The chemicals required to keep this equipment operational necessitated special environmental permitting from the Ohio EPA.

Voltea's Membrane Capacitive Deionization (CapDI) was examined as a possible treatment option for the river water, and it was a particularly attractive solution due to the relatively simple pretreatment requirements, as well as the fact that no special permitting was necessary because the technology does not use chemicals to operate.

CapDI removes TDS from water sources with minimal pretreatment requirements. It eliminates dissolved salts

Figure 1. Water quality

Parameter	Avg. Black River	Requirements	Product Water
Chloride (ppm)	98.5	<50	22.5
Sulfate (ppm)	97.5	<50	32.5
Phosphate (ppm)	0.3	<0.2	0.1
Conductivity (µS/cm)	800.0	N/A	305.0
Hardness (ppm as CaCO3)	132.5	N/A	29.2

**Test data independently provided by CWM Environment Inc.*

and other minerals via direct current, or electro-deionization, where oppositely charged salt ions are attracted to electrodes, leaving pure water flowing out of the cells in a two-step process of purification and regeneration.

This technology's "tunability" feature is a major difference between it and traditional systems. This means customers can choose the level of dissolved salts removed—salt removal is, thus, "tunable." Not all applications require the same removal rate, which eliminates any remineralization needed from using traditional desalination and softening technologies.

The steel mill selected CapDI because it required minimal pretreatment with low expected energy consumption, minimal intervention and no special permitting. The forecasted operational costs included with the assessment were lower than any of the traditional desalination technologies evaluated.

The customer's need for high-quality water (the lowest controlled TDS level) led to the selection and use of CapDI to treat river water as the feed source at this location.

Installed at the beginning of the spring season, the CapDI system experienced extreme fluctuations in feedwater quality. The spring runoff of road salts from the winter season in the local area resulted in the Black River conductivity varying between 400 and 1,400 µS/cm, corresponding to 23 to 180 ppm chlorides with turbidity spiking up to 800 NTU.

This type of fluctuation in feedwater conductivity is common in areas of extreme winter weather. This occurs in areas without cold winter temperatures simply due to seasonal differences in rainfall that can concentrate or dilute salinity levels in surface waters such as rivers. Finding a water treatment system that can self-adjust to these naturally occurring fluctuations can be a challenge.

Despite the seasonal fluctuations in feedwater quality, the CapDI system operated with only a simple conventional multimedia filtration. The filtration requirements for comparable traditional desalination technologies would have been eight times the cost of the simple filtration Voltea's system required.

Producing Quality Results

Average chloride, sulfate and phosphate levels in the Black River feedwater were significantly above the targets set by the cooling tower manufacturer. Desalination of the river water was thus required to make it suitable as a feed source to the cooling tower. The CapDI system was set to a fixed ion removal rate to meet the water quality salinity requirements needed by the steel mill and cooling tower manufacturer.

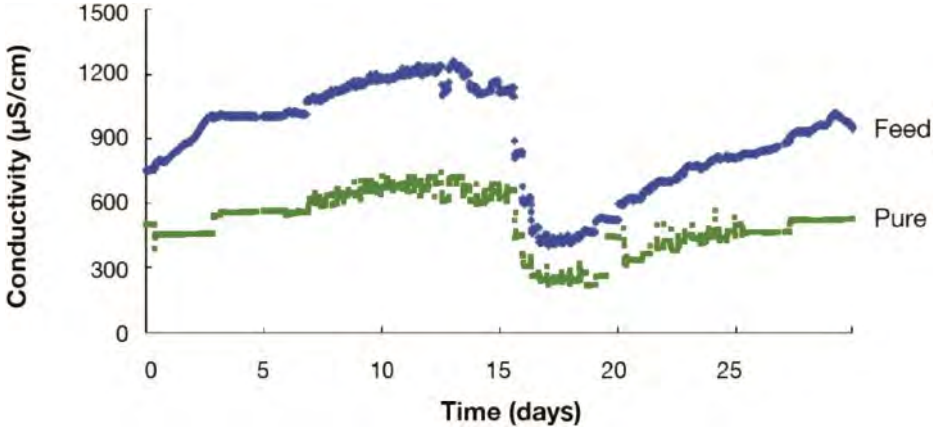
Once CapDI was installed, the salinity level of the feedwater to the cooling tower met the requirements of the manufacturer:

- Chloride ions in the treated water decreased by 77%;
- The concentration of sulfate and phosphate ions were reduced by 67%; and
- So-called hardness and over-all conductivity were reduced by 78% and 62%.

Fig. 1 above represents the average mineral and salinity levels of the Black River, the target levels for each in the cooling tower feedwater, and the purified product water from the CapDI system.

Hardness ions are the most critical factor in the scale and corrosion buildup in cooling towers. As these natural ions build up in the cooling tower over time with repeated cycles of evaporation, corrosion and scaling can become problems. Controlling this corrosion and scaling requires the addition of protective chemicals to the cooling tower makeup water. When the water is discharged during blowdown cycles, these chemicals are released and eventually end up in the municipal wastewater treatment plant or

Figure 2. Feed & Pure Water Conductivity Treated by CapDI



environment. CapDI technology does not require the use of chemicals to operate, and by delivering feedwater to the cooling tower with a lower salinity level, less chemical is required to protect the tower.

Implementation of dynamic control on the CapDI system improved the overall operation, allowing it to constantly monitor and adjust performance based on real-world fluctuations in water quality. This means constant water quality is delivered in the purified water regardless of variations in the feedwater coming into the system.

CapDI systems are equipped with expert remote monitoring and control capabilities, and, once subscribed, customers no longer are required to devote internal resources to monitor their water treatment system.

The Black River, previously deemed unfit for cooling tower applications using traditional desalination technologies, now is a reliable feedwater source thanks to the implementation of electro-deionization technology. The chemical-free process enabled the site to discharge the concentrated effluent of the CapDI system directly into the river without having to secure an additional site permit for disposal. IWWD

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Emerging Contaminants

Water quality industry tackles POU & POE treatment options for PFAS & GenX 18

Water-Wise Washing

Laundry facility uses electro-desalination technology to reduce water use & save energy

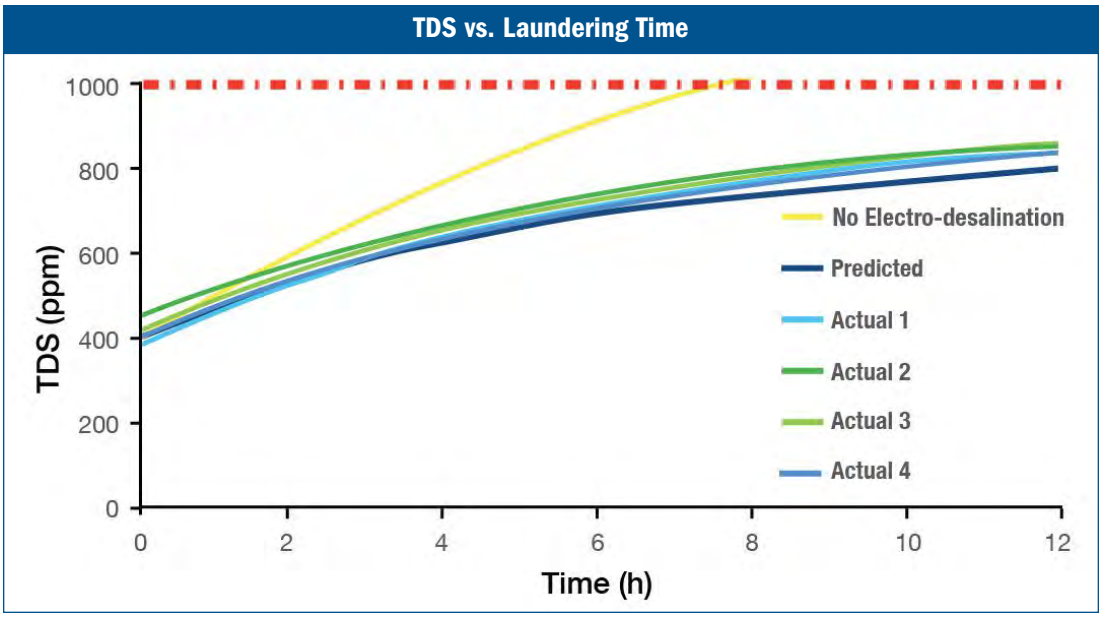
BY BRYAN BRISTER

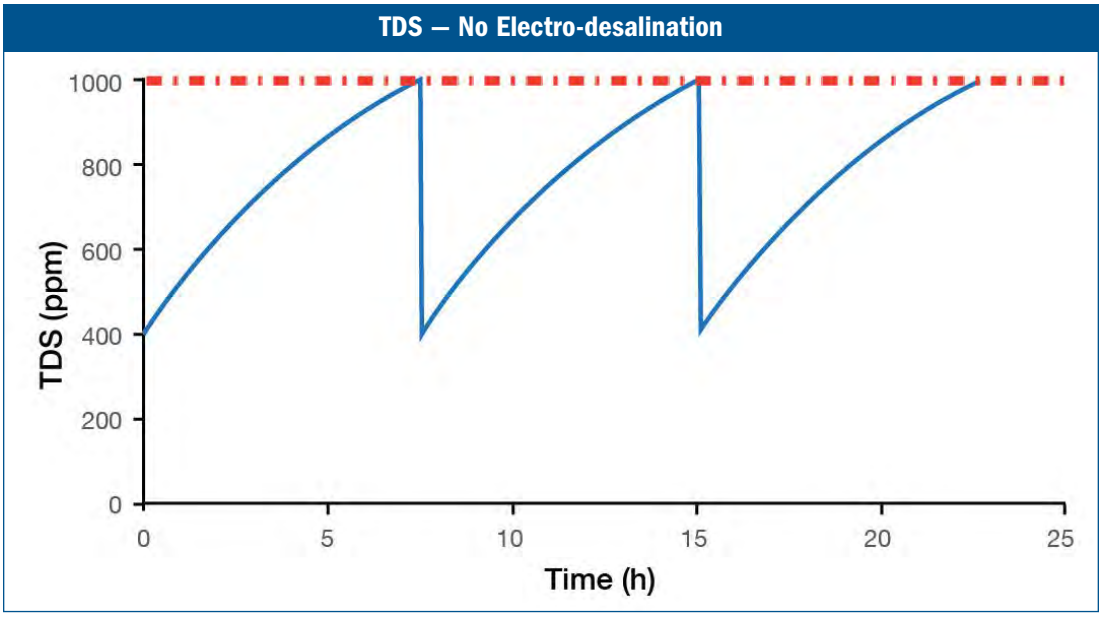
Like other industries such as hospitality, health care, and food and beverage, the success of commercial laundries depends on the water quality. Water free of impurities is the key to making fabrics cleaner and softer, as well as maintaining the quality of equipment.

Laundry detergents and fabric softeners often leave salts, nutrients and suspended solids in the water that must be effectively filtered out. Hard water can have negative impacts on laundry, one of which is to make soap less effective, thus requiring more to be used to adequately clean. It also can lessen the wear life of fabric, making it feel stiff and appear worn.

Because commercial laundries consume and discharge large volumes of water, there are certain challenges that must be addressed. Discharging massive amounts of water not only is wasteful, but also is costly. In fact, according to the Alliance for Water Efficiency, water and wastewater costs represent more than 50% of the total operating costs in the typical commercial laundry. Facilities must find a way to cut down on waste without significantly increasing costs.

The electro-desalination system allows the laundry reuse process to run for longer because the daily discharge limit of 1,000 ppm was never reached.





In order to cut down on the amount of water discharged, regulatory authorities have enforced stringent water quality standards to limit discharge volumes. As a result, commercial laundry operations are under increasing pressure to reduce water consumption and minimize discharge volumes.

It generally is accepted that total dissolved solids (TDS) above 750 to 1,000 ppm causes dull linens. TDS includes iron, manganese, calcium, alkalinity and other dissolved salts, all of which are known to cause linens to gray.

Consequently, effective use of recycled laundry water has been limited by the inability to affordably and reliably remove TDS at high temperatures.

Regulatory Challenges

A commercial laundry site in the U.S. was limited to an eight-hour work shift as a result of state regulations limiting water discharge. Traditional desalination technologies on average allow a water recovery rate of 50% to 70%, which means a laundry operation will reach discharge limits in a single workday. It was critical to this customer to find a solution for increasing its water recovery rate to allow for a longer work shift, while reducing total water consumption to meet the new water quality standards and regulations.

Instead of operating a traditional desalination technology, this company was offered Voltea's membrane capacitive deionization technology, called CapDI, as a solution. The technology removes TDS from brackish

water sources by means of electro-desalination in a two-step process of purification and regeneration. During the electro-desalination process, ions are removed from the feed water by applying an electrical potential difference between two electrodes covered with selective ion exchange membranes.

In the purification step, these electrodes are separated from each other by a mesh spacer, whereby water flows and the oppositely charged ions are removed from the feed water. The removed ions temporarily are stored in the electrical double layers formed at the electrode surface. When the electrodes become saturated with ions, they are regenerated by reversing the applied voltage and/or polarity. After the ions have been released from the electrodes, a concentrate stream is produced and captured ions are flushed from the module. It is important to note that ions are removed through membranes and water molecules stay behind. The success of the technology has made it a viable option in the global water purification market, competing with traditional desalination technologies such as reverse osmosis (RO) and electrodialysis (ED/EDR).

Desalination Differences

RO is a traditional desalination technology that removes contaminants from water by using pressure to force water through a semi-permeable membrane. However, RO can be wasteful and its users can lose nearly 20 gal of water for every gallon of filtered water produced. Additionally, the water is left with an acidic pH because RO removes most of the minerals in the process. An acidic pH actually can weaken the fibers of clothing and lessen its lifespan.

ED/EDR works by transporting ions through semipermeable membranes, but does not always completely remove chemicals and bacteria. Pre- and post-treatment might be needed. Ion exchange softeners can release sodium and chloride into the water, which can cause corrosion of piping infrastructure.

The benefits of electro-desalination technology—for this laundry site and other commercial applications—include:

- Higher water recovery (70% to 95%);
- Reduced scale and calcium build-up;
- No chemical usage; and
- Reduced water consumption.

The technology also addresses removing TDS at high water temperatures, a specific commercial laundry challenge. Traditional desalination technologies require the water to be cooled before TDS removal, which means it must then be reheated for laundering, requiring more energy, time and costs. Electro-desalination eliminates the additional heating costs plus the extended amount of time required to access this step during the workday using common desalination technologies.

There are additional cost savings because electro-desalination uses an electrical process for TDS removal rather than the high pressure required by traditional technologies, such as RO. The dynamic control and remote monitoring subscription of electro-desalination system installations allows continuous monitoring of water quality by field experts with fully automated operation. This low maintenance requirement allowed the company to focus on its daily operations instead of relying on an internal employee. Data showed the system was helping the laundry site comply with regulations while effectively removing TDS.

This membrane capacitive deionization technology uses electro-desalination in a two-step process.

Long-Term Benefits

Voltea closely monitored the commercial laundry facility installation for six months. This facility achieved significant cost savings from reduced chemical usage; energy and heat reduction; improved water reuse; and by doubling its daily throughput without exceeding daily discharge permit limits, which was attained because of the ability to utilize recycled water more effectively.

> Without the technology, this laundry facility only ran eight hours before reaching a TDS limit of 1,000 ppm.

Notably, Voltea's original forecast model was in line with the actual 100 data sets run over the six-month operational time period. The data in the graph on page CW4 shows that the electro-desalilnation system allows the laundry reuse process to run for longer since the daily discharge limit of 1,000 ppm was never reached. As a consequence, multiple shifts can operate, allowing the laundry to not only be more efficient, but also more cost-effective. This all was achieved at laundering temperatures, meaning there are no additional energy costs as there is no additional cooling necessary.

The addition of electro-desalination to the laundry wastewater treatment system delivered TDS removal at laundering temperatures, high water recovery and enabled efficient recycling of spent laundry water. Without the technology, this laundry facility only ran eight hours before reaching a TDS limit of 1,000 ppm. The water was drained, refilled and reheated before continuing operation.

It also was important for this laundry facility to ensure that its clients' white linens remained white without becoming dull wash after wash. By removing TDS at high temperatures using electro-desalination, the facility was able to keep up with the quality standards of many industries that relied on the laundry site—such as hospitality, health care, industrial uniforms and food and beverage—while abiding by discharge and water usage regulations passed in its state. **CW**

Bryan Brister is CEO of Voltea. Brister can be reached at 469.620.0133 or bryan.brister@voltea.com.

WATER

NATURE VERSUS TECH

Coffee and tea can now be tuned to the ideal conditions for improving the taste of water while reducing environmental impact.

BY PETER SZYMCZAK

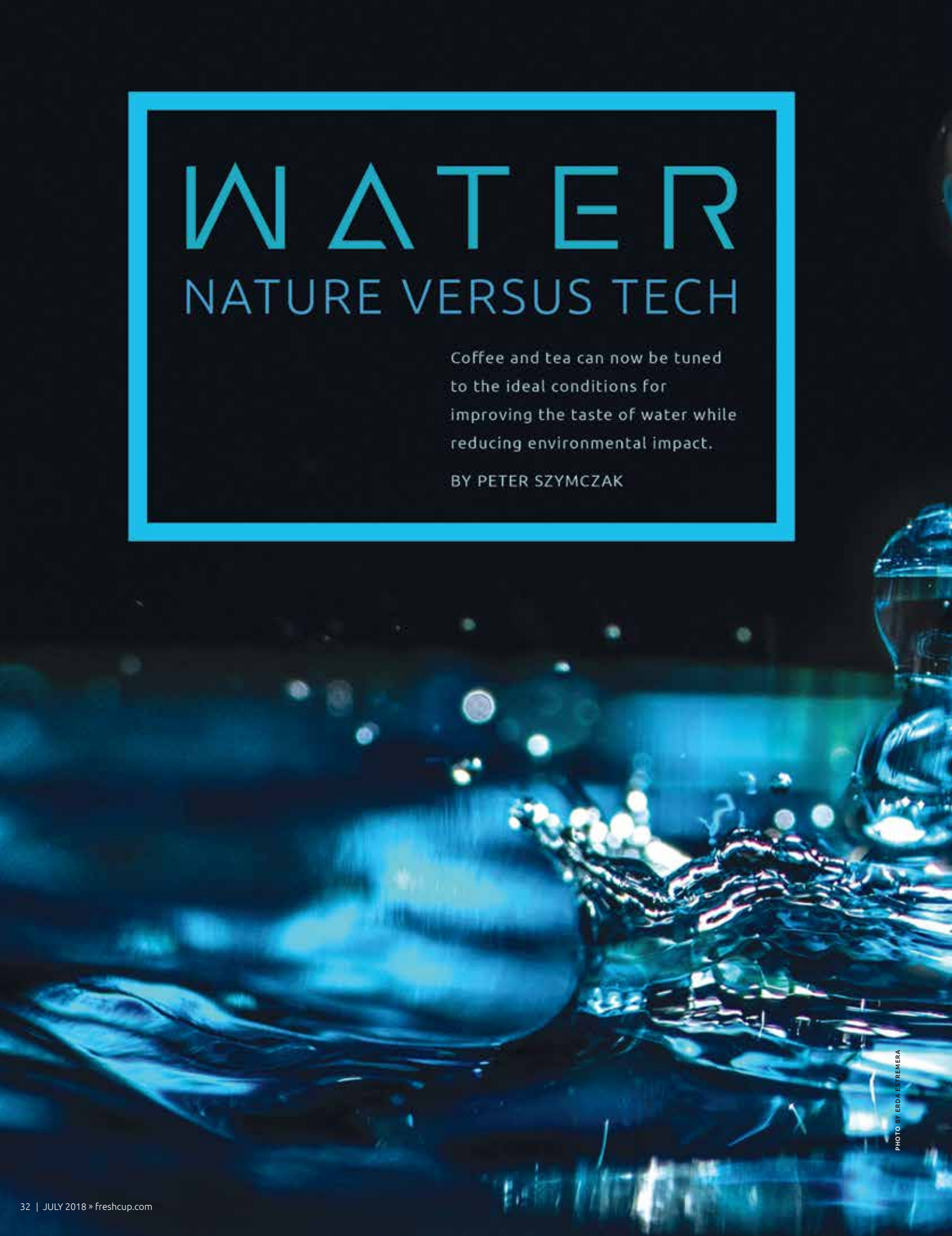


PHOTO BY ERDA ESTREMERA

The Bull Run Watershed is a protected surface water supply, located in the Mt. Hood National Forest, 26 miles from Portland, Oregon. The watershed is managed "From Forest to Faucet" by the Portland Water Bureau, the municipal department led by Commissioner-in-Charge Nick *Fish* (appropriately enough), to sustain and supply clean drinking water to a quarter of Oregon's population. In a typical year, the watershed receives an abundant 135 inches of precipitation—rain and snow—that flows into the Bull Run River and then into two reservoirs that store nearly 10 billion gallons of drinking water.

The quality of Oregon's water infrastructure is a big reason commonly cited for the abundance of local breweries, wineries, distilleries, agricultural and horticultural greenhouses, acres of farmland growing hazelnuts, hops, berries, walnuts, and now tons more marijuana than the population's already considerable appetite can possibly consume.

Abundance aside, how clean and pristine is the water?

Consider that we have roughly seven billion people on the planet today, and yet we have the same amount of water available to us today as when there were only a million of us. Humans have greatly mucked up the water, while the Earth's atmosphere struggles to cycle water through Mother Nature's natural process of evaporation, condensation, and precipitation, the water wheel constantly churning to sustain life on this Earth.

And yet café owners wonder, "Why do I need another filter?"

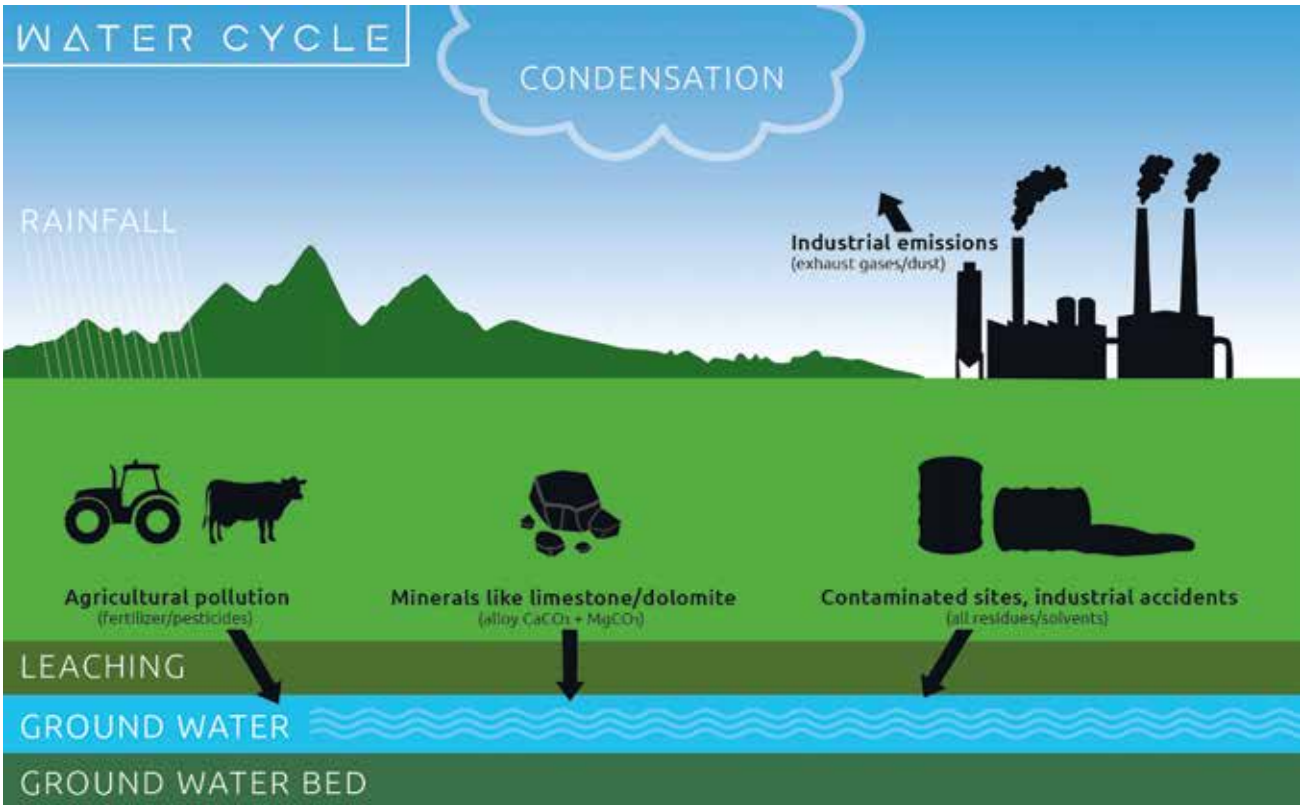
Stating the obvious, water is integral to coffee and tea. Whether chai or cold brew, cappuccino or kombucha, macchiato or matcha smoothie, the majority of the beverage is water, way up there in the high 90th percentile. In short, your product is only as good as the water you put in it.

Brent Wolczynski, Head Brewer at Cold Brew for **Stumptown Coffee Roasters** in Portland, Oregon, makes full use of that abundant Bull Run water supply and a robust filtration system.

"Water must be delicious, not tasting of anything used to treat it that would distort the profile of the coffee," he says. "The water we're using in our cafés is being filtered and calibrated to be consistent. At the cold brew facility, water goes through a sediment filter, carbon filter to strip chlorine, and UV filters to kill bacteria."

Technology helps take out, put back, and balance water back to the way Mother Nature intended.

Café owners must filter for themselves the numerous ways they can achieve the best water supply in their operations and determine where they fall within the water purification and filtration spectrum. Filtration options currently available to café owners, »



baristas, and aficionados include reverse osmosis, ion-exchange cartridges, and simple chambers.

WaterWise uses a patented, accurate adjustable head to pass incoming water quality through a filter. "It takes out what's needed to be taken out to leave you with a recipe-quality water," explains Keith Black, managing partner of WaterWise in Alcoa, Tennessee.

For cooking, not much mineral content needs to be left behind. But for coffee and tea, the exact opposite is true.

"For coffee and tea, you need more mineral content left behind to get that flavor exchange, but you still need to remove the things that are objectionable from a taste and aroma standpoint," Black says.

WaterWise technology looks at incoming quality of water the makes adjustments.

"For instance, if you have 10 grains of hardness coming into your water, our chart would say to set your head for a bypass of 40 percent, so that 60 percent of the water coming in will remove all of the hardness and 40 percent will be bypassed—only the questionable taste and odor stuff will be removed," Black explains. "Then it joins up with the water that has had its hardness removed and that goes through the carbon filter for taste and odor as well."

Hardness levels in water are mostly determined by geography. Water is different everywhere, whether you live by the ocean, in a drought-stricken region, or in regions where minerals are prevalent due to an abundant level of rock formations underground or other contaminants and pollutants.

Dialing in water at one specific place is a challenge in and of itself, let alone multiple locations.

"We get a lot of people who say they have six locations now, I use the same coffee, the same brand espresso machine, the same grind, the same everything, and my coffee doesn't have that same consistency across all my café footprints that I want," Black says. "The coffee doesn't taste the same in this town as it does in that town, even just 20 miles away."

Café owners and consumers alike may say it's a regional thing. Coffee and tea tastes a certain way depending on where it's brewed. It's terroir. But once you know what a good cup of coffee or chai tastes like, people are less willing to put up with anything that tastes "off."

Consistency across regional and national brands is one thing, but people may become more attuned to another water rationale: protecting their equipment.

Water filtration can save money in operational and maintenance costs. Scale, from a physics and chemistry standpoint, is impossible to form when filters are properly installed and set up.

Higher hardness levels can be detrimental to valuable espresso equipment and scale formation may go unnoticed until it's too late for a quick fix. In addition, treating hard water with traditional water desalination technologies such as RO that use chemicals and salt can cause environmental-related issues because of the amount of salinity released back into the ecosystem.

Major coffee manufacturers such as **Bunn** and **Franke** use WaterWise technology in their specialty coffee equipment, as do roasters such as Canterbury in British Colombia, Canada, and Sparrow Coffee in Chicago, Illinois.

AMERICANO PHOTO BY TYLER NIX

THE FUTURE OF WATER SOFTENING: ELECTRO-DEIONIZATION

A new technology known as Membrane Capacitive Deionization (MCD) stands to improve the typical water desalination and softening process.

MCD's works via "electro-deionization," where oppositely charged salt ions are attracted to electrodes, leaving pure water flowing out of the cells in a two-step process of purification and regeneration.

A major difference with this technology is "tunability"—the level to which a user may choose to remove dissolved salts. This feature automatically eliminates one of the steps of the typical desalination and softening process—the remineralization bed—because the level of salts chosen remains in the water throughout the process.

Another key difference is that MCD's modules are able to receive and remove hard salts in addition to soft salts, which also eliminates the need for a water softener as the first step.

"Water is a very important and often overlooked ingredient in the coffee making process, and water chemistry or dissolved solids can affect extraction and result in under-extracted (bitter) or over-extracted (sour) tastes," explains Dewitt Dees of Voltea, the pioneer of Membrane Capacitive Deionization (CapDI©).

Traditional desalination and softening systems typically include three pieces of equipment: a water softener, a reverse osmosis system, and a remineralization bed.

First, the water softener removes all the hard salts, such as calcium, magnesium, and carbonates, and replaces them with twice the amount of soft salts, such as sodium and potassium, preparing the water to process easily through the reverse osmosis system, which then removes all the soft salts to produce ultra-pure water with no minerals remaining. Lastly, the remineralization bed adds back the level of salt and other minerals required for quality, taste, and health benefits.

VOLTEA'S DIUSE is a miniaturized version of its current CapDI© systems specifically made for point-of-use applications, like for the water in a single americano.

Generally, these systems achieve on average just 50–70 percent water recovery. Up to half of the water treated gets discharged back into the environment, full of the harsh, damaging salts that were removed along the way.

New water softener regulations have been established, especially in areas of water scarcity, limiting the amount of salts and other minerals that flow back into the local water source.

Water quality is worth looking into—in Portland or wherever in the world you are located. FC

Food&Drink TECHNOLOGY
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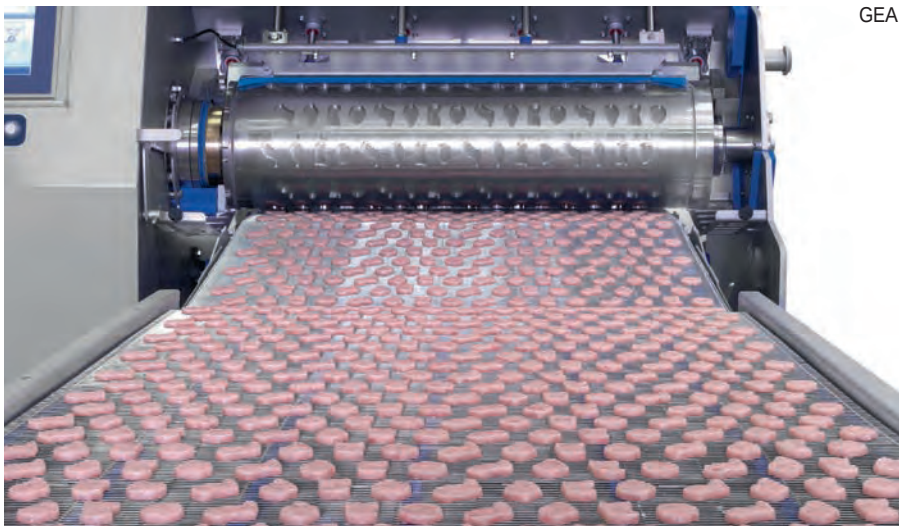

GEA

Top tech

Anuga FoodTec returned to Cologne, Germany from 20-23 March, showcasing the latest in food processing and packaging. *Food & Drink Technology* walked the halls to see the innovation in action

After already registering a growth in exhibition space and a 13 per cent increase in the number of exhibitors in the run-up to the event, Anuga FoodTec 2018 was also able to achieve a significant rise in the number of visitors: more than 50,000 experts from the food industry attended between 20 to 23 March, an increase of around 11 per cent on the previous event. It also further increased its level of internationality, with visitors from 152 countries (+15 countries in comparison to the previous event).

The specialised programme organised by the DLG (German Agricultural Society) included numerous conferences, guided tours and lectures.

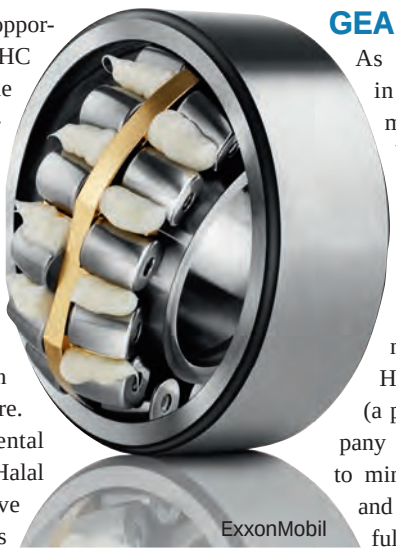
Katharina C Hamma, chief operating officer of Koelnmesse, explains, "The concept of Anuga FoodTec is unique and successful. The renewed growth across all key figures clearly underlines this."

Dr Reinhard Grandke, managing director of the DLG and chairman of the advisory board of Anuga FoodTec, adds, "Anuga FoodTec 2018 presented an array of technological innovations from the entire spectrum of the food and beverage industry. The extensive specialised programme on the highly relevant key theme, resource efficiency, offered the international audience numerous opportunities to systematically learn more about the optimisation of production processes – always with the aim of consuming less energy and water and reducing the waste of food. In Cologne, the latest scientific findings about food technology were once again linked up with the requirements of business practice in an exemplary way."

Exhibitor highlights

ExxonMobil

ExxonMobil used the opportunity to launch Mobil SHC Grease 462 PF to the food and beverage sector. The advanced NSF H1-registered, high temperature synthetic lubricant promises superior bearing protection for corrugator rollers operating at temperatures up to 240˚C and in the presence of moisture. Formulated for incidental food contact, IFANCA Halal and Kosher and Parve product certificated, its formulation delivers enhanced product reliability and long grease life, the company says, helping to increase productivity and cut maintenance, reducing human-machine interactions and enhancing safety.


ExxonMobil

"A large percentage of corrugated card output is employed as transit packaging for food and beverages. It is therefore essential that lubricants that are NSF H1 registered for incidental food contact are used in corrugators," comments Inken Reuser, EAME offer advisor. "Mobil SHC Grease 462 PF meets this requirement without compromising on overall performance."

GEA

As well as developments in continuous stretching machines, spiral freezers, batch freeze dryers and high-pressure pumps, GEA was displaying its new MaxiFormer step-filling system that manages the communication between the Handtmann vacuum filler (a product of a partner company of GEA) and the former to minimise the pressure used and to fill each cavity carefully and progressively. This reduces wastage, improves filling accuracy, creates a higher quality formed product with excellent shape retention and minimises down time for cleaning, the company says.

"Handtmann was happy to partner with GEA on the development of the new filling concept and provide the vacuum filler with customised functions for the GEA MaxiFormer," notes Joachim Frommann, head of sales at Albert Handtmann Maschinenfabrik. "This partnership has now resulted in a unique forming concept with excellent performance and flexibility in shaping products."

Multivac

In addition to complete lines, in which Multivac's portioning systems and slicers are integrated, the company also presented a complete product range for producing vacuum skin packs with MultiFresh. Examples were shown on a high-output T 800 tray-sealer, as well as on a R 105 MF thermoforming packaging machine. MultiFresh films, that Multivac has developed in conjunction with film manufacturers, were running on both machines. A labelling solution for the D labelling of packs was also on show. As with banderole or sleeve, the label is completely wrapped around the pack, offering many possibilities for different types of pack design, as well as

Multivac

increasing the attractiveness of the packs at the point of sale, the company says. Finally, it highlighted its concepts in response to the plastics strategy, including the fact that the technology and equipment options of the packaging machines are already designed in such a way that they can run a wide range of packaging materials, including fibre-based materials such as paper or board.

OAL

Attendees could learn about new technologies including robotics, artificial intelligence, big data, cryogenic cooling and steam infusion on the OAL stand. With a demonstration of its April robotics weighing station, the company explained how the use of robotics can transform the traditionally labour-intensive tasks of handling, weighing and preparing raw ingredients. April automates the weighing of micro-ingredients in quantities of up to 5kg. The system uses a collaborative robot to weigh out free flowing and non-free flowing powdered ingredients to an accuracy of 1g with zero cross-contamination.

OAL

OAL also showcased a fast growing food processing technology, steam infusion, showing how 500kg of fresh sauce can be cooked in just five minutes. Steam infusion heating and mixing is scientifically proven to help food manufacturers overcome slow cooking times, burn-on contamination and over-processing, the company explains.

PMMI

The Association for Packaging and Processing Technologies (PMMI) was discussing its latest trend reports, including *The Evolution of Automation: Industry Research Report*.

It identifies six trends driving plant floor automation: lack of skilled labour and labour shortages, global increase in product demand, rising demand for flexible manufacturing, producing products with consistent quality, overall operating cost reductions and smart machine technology and cobots. In addition, it gives six reasons why automation is a gradual adoption process: utilising data for operational improvements will take years and will require educating the industry on how to gather it, use it, store it and apply it; with automation costs decreasing, companies of all sizes will have an easier time achieving an acceptable ROI; disparate and legacy systems persist and need to be connected, but upgrading can be expensive; IT and operation technology (OT) convergence for common strategies is still emerging; open platform standards are evolving; and cybersecurity, in a layered systems approach, will help alleviate security issues.

SPX Flow

Among the highlights on the SPX Flow stand was the launch of its new range of mix-proof, hygienic valves. Used for the reliable separation of dissimilar products, the D4 Series helps fulfil today's customer demands for production flexibility, maximised productivity, rapid return on investment and reduced risk product and personnel, according to the company. Intended to ensure complete cleaning of product contact surfaces, the valves are designed to reduce operational cost overheads by minimising CIP losses. In addition, the valves are fully balanced for dependable operation against pressure spikes and flow in any direction.

The complete D4 range includes the primary D4 model, which meets the basic needs for reliable product separation and seat lift (SL) or non-seat lift (NSL) cleanability, and the DA4 ultra-hygienic model for critical applications requiring enhanced cleanability of all product contact surfaces.

Voltea

Voltea was present with its tunable water deionisation technology, designed to remove dissolved salts from a variety of water sources ranging from tap water and brackish groundwater to industrial process water. Its Membrane Capacitive Deionisation (CapDI) technology achieves this at a lower economic cost and reduced environmental impact than any other available technology, Voltea claims. CapDI operates at temperatures ranging from 5-60°C, on challenging higher turbidity feed waters, with minimal operator intervention. The technology is environmentally friendly due to its low energy consumption and minimal to no chemical usage, thus allowing any unrecovered water to flow back into the ecosystem safely.

In addition, its newest product, DiUse, was on show. A miniaturised version of the CapDI systems, it is specifically made for point-of-use applications. It softens and desalinates brackish water for homes and businesses at an advantage to traditional desalination technologies due to it being a salt-free, chemical-free alternative. ■

The next Anuga FoodTec will take place from 23 to 26 March 2021 in Cologne, Germany

SPX Flow

Global Spotlight

Crown Brands LLC of Lincolnshire, IL has completed the acquisition of **Tomlinson Industries** of Cleveland, OH. Founded in 1911, Tomlinson Industries is the world's leading manufacturer of No-Drip® faucets and fittings for beverage and liquid dispensing.

The **Water Quality Association** has been certified as a great workplace by the independent analysts at Great Place to Work®. The association earned this credential based on extensive ratings provided by its employees in anonymous surveys.

North America

WaterStep aid in North Carolina

Louisville, TN-based non-profit WaterStep has returned from a week-long trip to aid those affected by Hurricane Florence in North Carolina. Five organization members provided 10 disaster relief kits that were able to purify water, as well as generate chlorine and bleach for disinfection and sanitation. The group set up water purification and disinfection equipment in several locations, many of which rely on well water (that had been contaminated for over a week) for their safe water needs. Locals were also trained to operate and maintain the units. To donate to WaterStep's disaster relief efforts and help provide safe water to disaster survivors, visit WaterStep.org/donate. To learn more, call (502) 568-6342 or visit waterstep.org.

Nitrate pollution reported

A new Environmental Working Group (EWG) study, indicating widespread nitrate pollution in US drinking water (at levels linked to increased cancer risk), underscores the need for in-home water filtration, the Water Quality Association said. In the October 2 report, the EWG analyzed tests of public water systems and found that 1,700 communities across the US regularly have nitrate levels that the National Cancer Institute says can increase the risk of cancer. Two-thirds of those systems (serving more than three million Americans) have no nitrate treatment process. Home filtration devices or systems can remove nitrate or other contaminants and WQA offers a technical fact sheet on nitrate/nitrite at https://www.wqa.org/learn-about-water/common-contaminants/nitrate-nitrite.

Waterlogic accquisitions announced

Waterlogic announced the acquisition of Minnesota Water and Water Engineering Technologies. Minnesota Water has been a leading provider of PHSI POU water coolers since 2012. Water Engineering Technologies (WET), a premium provider of POU water coolers, has been headquartered in Burien, WA since 1998.

New Voltea HQ in Texas

Voltea announced it has moved into a larger US headquarters in Dallas, TX, as its global orders have increased by 300 percent over the last 12 months. The new office, manufacturing plant and training center reflect the rapid growth of the company, including the release of two groundbreaking new products in the last year.

Las Vegas hotel to use IoT program

Apana has partnered with MGM Resorts International on a water conservation program at the Bellagio Hotel and Casino in Las Vegas, NV. WaterStart connected the technology company with MGM, in partnership with the Southern Nevada Water Authority (SNWA). This initial project involves connecting Apana's IoT technology to the casino's water network in order to provide real-time, actionable insight about leaks and irregular use to hotel engineering staff through the companies analytics software.

AWT conference recap

The Association of Water Technologies' (AWT) 2018 Annual Convention & Exposition Orlando, FL in September has been hailed as a huge success, with nearly 1,300 industry leaders and exhibiting companies. The event featured a panel that addressed the future of water treatment, noting emphasis on increased sophistication in how water treatment companies contract with customers, as well as several notable paper presentations. The next AWT Annual Convention & Exposition will be held September 11-14, 2019 in Palm Springs, CA.

Bluewater investment announced

Bluewater has announced a strategic investment for a minority stake in TAPP, a European tap-water filtration company. The investment is designed to help TAPP accelerate its vision to provide sustainable, faucet-based filtration solutions for clean and affordable tap water. In addition, Bluewater has officially opnened a head office in Cape Town, South Africa.

Solenis price increase announced

Solenis announced it will increase prices by five to 20 percent on all process, functional and water treatment chemicals globally, effective immediately or as customer contracts allow. The price increase is necessary due to the steep increase in raw material costs and the supply-demand tightness experienced throughout 2018, which is expected to continue and increase during 2019.

WC&P Glossary of Terms

CI	Certified Installer	**OEM**	original equipment manufacturer	**VFD**	variable frequency drive
CIP	clean in place	**ORP**	oxidation-reduction potential	**VOC**	volatile organic compounds
CWS	Certified Water Specialist	**PE**	Professional Engineer	**Organizations and Associations:**	
DI	deionization	**PLC**	programmable logic controller	**ANSI**	American National Standards Institute
DBP	disinfection byproduct	**POE**	point of entry	**ASPE**	American Society of Plumbing Engineers
EDI	electrodeionization	**POU**	point of use	**CDC**	Centers for Disease Control and Prevention
FRP	fiberglass reinforced plastic	**PVC**	polyvinylchloride	**FDA**	US Food and Drug Administration
GAC	granulated activated carbon	**RO**	reverse osmosis	**IAMPO**	International Association of Plumbing and Mechanical Officials
gpd	gallons per day	**TOC**	total organic carbon	**NGWA**	National Ground Water Association
gpm	gallons per minute	**THM**	trihalomethane	**NSF**	National Sanitation Foundation
MF	microfiltration	**TDS**	total dissolved solids	**US EPA**	US Environmental Protection Agency
MWS	Master Water Specialist	**UF**	ultrafiltration	**WQA**	Water Quality Association
NOM	natural organic matter	**UV**	ultraviolet	**WRF**	Water Research Foundation

WATER CONDITIONING & PURIFICATION MAGAZINE

Voltea CFO named

SEPTEMBER 15, 2018

Voltea, Ltd. announced that Lan He has joined the company as Chief Financial Officer and as a member of the Executive Committee. She joins Voltea from CECO Environmental, where she was Vice President of Finance. Lan He has an extensive background in financial planning and analysis, change management and mergers and acquisitions. Prior to her role with CECO Environmental, she held positions with Daikin AC (Americas), Siemens Transportation Systems and Siemens Gigaset Communications. Lan He holds an MBA Degree from University of Mississippi and is a licensed CPA in Texas.

WATER CONDITIONING & PURIFICATION MAGAZINE

Europe: Voltea honored by GWI

JUNE 15, 2018

Voltea was named the Breakthrough Water Technology Company of the Year by Global Water Intelligence (GWI) during the Global Water Awards ceremony in Paris, France. The awards, which recognize companies that make a significant contribution to the worldwide water industry, were part of GWI's Global Water Summit. GWI cited Voltea's "successful commercialization of its CapDI© technology" as a key factor in earning the award.

SEP 20, 2018

INDUSTRY NEWS WEEK 9/16/18

Voltea Moves to Larger U.S. Headquarters

Voltea has moved into a larger U.S. headquarters location as its global orders have increased by 300% over the last 12 months. The increase in orders was sparked primarily by two new water purification products: point-of-use system DiUse, which is popular with restaurants and coffee shops; and point-of-entry system, DiEntry, which is designed for residential use. Like Voltea's other products, they allow for tunable water purification at a low economic cost and reduced environmental impact.

An important part of the Dallas expansion is a training area that will house systems from each of Voltea's three main product lines: DiUse, DiEntry and the Industrial Series. The company is gearing this area toward distributors, resellers and system integrators.

AUG 30, 2018

WATER PURIFICATION

DiEntry is a residential water purification unit that addresses quality, taste and waste by using energy-saving CapDI technology to tune water without chemicals or salt. DiEntry provides customizable and quality water within the home, and provides a small footprint that is easy to design and build around, as it needs less space than other residential water treatment systems.

AUG 24, 2018

INDUSTRY NEWS WEEK 8/19/18

Voltea Appoints New Chief Financial Officer

Voltea Ltd., announced the appointment of Lan He as the company's chief financial officer and as a member of the Executive Committee. Previously, Lan He was the vice president of finance for CECO Environmental. Prior to that role, Lan He held roles with Daikin AC, Siemens Transportation Systems and Siemens Gigaset Communications.

Voltea Moves to Larger U.S. Headquarters

Staff Writer | October 15, 2018

Water purification tech company says global orders increased 300% over past year

DALLAS — **Voltea(http://www.voltea.com)**, which specializes in membrane capacitive deionization (CapDI©) water purification technology, has moved into a larger U.S. headquarters location here as its global orders have increased by 300% over the last 12 months, the company reports.

The new office, manufacturing plant and training center, along with the need to hire engineering and IT staff, reflect the rapid growth of the company, including the release of two products in the last year.

"We're even further along than we had hoped to be when we opened our U.S. headquarters just two years ago, which speaks volumes about our industrious team and the disruptive technology we've developed," says Voltea CEO Bryan Brister. "Expanding our Dallas facility helps us continue innovating at a pace that is extraordinary in the water industry."

Voltea says the increase in orders was sparked primarily by two new water purification products: point-of-use system DiUse®, which is popular with restaurants and coffee shops, and point-of-entry system, DiEntry®, which is designed for residential use.

An important part of the Dallas expansion is a training area that will house systems from each of Voltea's three main product lines: DiUse, DiEntry and the Industrial Series. The company is gearing this area toward distributors, resellers and system integrators, giving them the opportunity to learn about the design and performance of Voltea's CapDI technology firsthand.

Voltea, which has a European office in the Netherlands, has seen increased sales in the United States, as well as Europe, Asia and the Middle East. Investors in the company include Unilever Ventures, Anterra Capital, Rabobank, ETF, IDO and Detlef Taprogge.

RELATED STORIES

Voltea Names Lan He as Chief Financial Officer

Staff Writer | September 24, 2018

New hire joins entrepreneurial executive team at global water treatment company

DALLAS — **Voltea Ltd.(http://www.voltea.com)**, a provider of membrane capacitive deionization technology (CapDI©), has hired Lan He as chief financial officer and as a member of the executive committee, the company reports.

Lan He joins Voltea from CECO Environmental, a player in the global pollution control market, where she was vice president of finance. She has an extensive background in financial planning and analysis, change management and mergers and acquisitions.

"Mrs. He's experience executing on global growth strategies with successful multi-nationals brings value to the Voltea team," says Bryan Brister, CEO of Voltea. "She has an extensive finance background and has built and implemented scalable cross-functional processes that will benefit Voltea. These skills were precisely the expertise we were looking for to support our growth initiatives."

Prior to her role with CECO Environmental, Voltea says Lan He held roles with Daikin AC (Americas), Siemens Transportation Systems and Siemens Gigaset Communications. She also holds an MBA degree from University of Mississippi and is a licensed CPA in Texas.

"I look forward to working with such a talented, entrepreneurial-minded team that delivers real solutions and innovation to our environment," says Lan He about her new position. "I hope in some small way I can help contribute to the company's global impact on a cleaner earth."

Voltea Named Breakthrough Water Technology Company of the Year

(Photo: Voltea)

Staff Writer | May 14, 2018

Company wins global water award for successful commercialization of CapDI technology

DALLAS — **Voltea(http://www.voltea.com/en/)**, which provides electro-desalination water treatment technology, was named the Breakthrough Water Technology Company of the Year by Global Water Intelligence (GWI) at the **Global Water Awards(http://www.watermeetsmoney.com)** ceremony in Paris, April 15-17, the company reports.

The awards, which recognize companies that make a significant contribution to the worldwide water industry, were part of GWI's Global Water Summit. GWI cited Voltea's "successful commercialization of its CapDI©technology" as a key factor in earning the award.

"2017 saw Voltea's capacitive deionization (CapDI) technology take off as one of the most successful alternatives to reverse osmosis in recent years," GWI says. "It gained significant market traction in the industrial and commercial sectors, with over 100 systems being shipped. The company also closed a $10 million funding round to further accelerate its growth, and brought the full capacity of its robotic module assembly plant in Dallas online."

Voltea says its industrial and commercial CapDI© systems (which can be used in commercial laundry operations) run with patented CapDI technology, which monitors incoming water quality in real time, and self-adjusts performance to ensure it delivers consistent, precise water quality.

"We're extremely grateful to be recognized by GWI for our disruptive technology, which has transformed the way many industries treat water," says Voltea CEO Bryan Brister. "Our salt-free, chemical-free technology is being used by some of the top companies in the world for a variety of uses, from cooling towers to point-of-use water treatment for coffee and fountain drinks."

CapDI technology is a simple, two-step process wherein water flows between electrodes. The electrode surfaces are separated from the water by ion-selective membranes that allow positive or negative ions (salts) to pass. The system is tunable, allowing adjustable salt removal and continually adjusts to account for any fluctuations in feed water characteristics.

The winners of the GWI awards were chosen by GWI subscribers and Global Water Summit delegates.

"Voltea brings a compelling value proposition to clients who have traditionally favored RO, particularly given the need for less pretreatment and no remineralization," says GWI.

Voltea, which opened its production facility in the Dallas area about 18 months ago, says it has about 30 local employees and continues to grow.

ICYMI: Dallas is 5G Hotspot, DFW has Jobs for Hackers, Texas as a Major Biotech Hub, and Voltea's Water Tech Goes Smart for CES

Voltea brings water treatment to the smart home

Dallas-based Voltea is partnering with Green Builder Media for The Align Project, a groundbreaking, sustainable home that features forward-thinking products and technologies. The demonstration home—created by Green Builder Media and prefab home builder Kasita—will use the company's residential water treatment solution, according to a release.

Featured at two of the biggest technology- and building-focused trade shows in the U.S.—the Consumer Electronics Show (CES), organized by the Consumer Technology Association, and the National Association of Home Builders International Builders' Show (IBS)—the one-year project is designed to help people understand how we can align our lifestyles with our values and environmental realities.

At CES (January 8-11, 2019, Las Vegas) and IBS (February 19-21, 2019, Las Vegas), Voltea will serve CapDI-treated water side-by-side with Las Vegas city water to demonstrate the difference in quality. Voltea's water systems can integrate into any smart home for high-quality water with a low environmental impact, the company notes.

Voltea's water treatment solution is different from any other technology on the market, says CEO Bryan Brister in a statement. The company aims to deliver high-quality water without putting a strain on the environment. Its patented "CapDI" technology is a salt- and chemical-free two-step process that removes dissolved salts from water using electricity with less environmental cost than any other available technology, the company said in a release.

And it's been a good year for the company: Voltea was recently named Breakthrough Water Technology Company of the Year at the 2018 Global Water Summit in Paris. In September, the company moved into a larger U.S. headquarters location in Farmers Branch due to rapid growth sparked by two new water purification products and a 300 percent increase in global orders, per Voltea.

DI People: Boeing Adds AvionX President, Xome, Infolob Solutions Name New CEOs

In this roundup of DFW personnel activity, you'll also find details about new CFOs at Voltea and Trinity Hunt Partners, and a market director at BenefitMall.

BY LANCE MURRAY • AUG 13, 2018

LAN HE STEPS INTO CHIEF FINANCIAL OFFICER AT VOLTEA

Lan He has been named chief financial officer and a member of the executive committee at Voltea Ltd., the Farmers Branch-based provider of electro-desalination water treatment equipment.

Lan He

She joins Voltea from CECO Environmental, a key player in the global pollution control market, according to Voltea.

"Mrs. He's experience executing on global growth strategies with successful multinationals brings value to the Voltea team," CEO Bryan Brister said in the release. "She has an extensive finance background and has built and implemented scalable cross-functional processes that will benefit Voltea. These skills were precisely the expertise we were looking for to support our growth initiatives."

Voltea Unveils Innovative New Water Treatment System for Homes

DiEntry addresses the most pressing water issues in the market — quality, taste, and waste — via Voltea's energy-saving CapDI technology.

Photo: pinkomelet via iStock

BY LANCE MURRAY • JUN 28, 2018

Voltea, a global provider of electro-desalination water treatment technology with North Texas ties, announced this week that its launching its first residential-focused water purification unit.

The Netherlands-based company, whose U.S. headquarters is in Farmers Branch, introduced the unit called DiEntry this week at PCBC 2018 at the Moscone Center In San Francisco. PCBC is the largest homebuilding trade show representing the West Coast region.

Voltea is taking orders for delivery in August, including Dallas-Fort Worth, the company said.

> **"Home builders and homeowners will benefit from our experience providing water treatment solutions to some of the top companies in the world."**
> Brian Brister

According to Voltea, DiEntry addresses the most pressing water issues in the market — quality, taste, and waste — via the company's energy-saving CapDI technology that "tunes" water to meet the needs of the homeowner and community.

"We're pleased to provide a transformative product for the residential market that is based on our industry-leading CapDI technology," Voltea CEO Bryan Brister said in a statement. "Home builders and homeowners will benefit from our experience providing water treatment solutions to some of the top companies in the world."

The Farmers Branch facility makes the modules for the CapDI technology, and the system shell is made at the company's headquarters in Sassenheim, Netherlands.

This non-chemical technology has disrupted an industry that relies on chemical additives or so-called "soft" salt to treat water, the company said.

VOLTEA SYSTEMS PROVIDES ON-DEMAND PURIFIED WATER

The DiEntry technology offers "customizable" and fundamentally better water within the home as well as better and less water discharged from the home, Voltea said. The system requires less space than that other residential water treatment systems.

DiEntry offers advantages for homeowners who are interested in technology that facilitates a healthy and sustainable lifestyle, Voltea said. It gives homeowners control over the quality and

A DiEntry unit. [Photo courtesy of Voltea]

taste of their water while reducing the environmental impact because DiEntry uses and wastes less water than other products.

And, the system can be tuned to provide on-demand purified water from all faucets of the home with no salt or chemicals.

Earlier this year, Voltea was recognized as the Breakthrough Water Technology Company of the Year for its patented technology and growing customer base across multiple industries at the 2018 Global Water Summit in Paris.

In April, Voltea said it closed a $10 million funding round, with much of the new money going toward bolstering its North Texas facility.

At the time, Brister said the company planned on “hiring several new employees in the Dallas area, both highly skilled engineers and product team members.”

Voltea opened its facility in North Texas nearly two years ago, and has roughly 30 local employees.

Follow the Money: Intelis Capital Leads WNDYR Funding Round, Voltea Raises $10M

Funding rounds bring millions in capital from investors for North Texas startups. Here's a look at funding, mergers, and acquisitions involving companies and nonprofits with North Texas ties.

VOLTEA GETS $10M IN FUNDING ROUND

Voltea, a Netherlands-based global provider of electro-desalination water treatment technology with a U.S. headquarters in Farmers Branch, recently closed a $10 million funding round, with much of the new money going toward bolstering the North Texas facility.

> **"We are planning on a hiring several new employees in the Dallas area, both highly skilled engineers and product team members."**
> Bryan Brister

Voltea, which is backed by Unilever Ventures, the venture capital arm of Unilever PLC, this week was named the "Breakthrough Water Technology of the Year," by Global Water Intelligence at its Global Water Awards ceremony in Paris.

In addition to Unilever Ventures, funders include Environmental Technologies Fund (ETF), Rabobank, Anterra Capital, and the newest addition to this latest round was IDO Investments.

"We are planning on a hiring several new employees in the Dallas area, both highly skilled engineers and product team members," CEO Bryan Brister, who is based in Farmers Branch, said. "By winning this award shortly after closing a new funding raise and introducing a new product, we see a lot of momentum for 2018 and beyond."

Voltea opened its facility in North Texas about 18 months ago and has roughly 30 local employees.

DALLAS
BUSINESS JOURNAL

Commercial Real Estate

Farmers Branch company expands headquarters

Voltea, which provides water purification products, is expanding its headquarters in Farmers Branch.
VOLTEA

By Korri Kezar – Digital Editor, Dallas Business Journal
Oct 17, 2018, 3:10pm EDT

A 300-percent increase in orders over the past year has spurred Voltea to grow its headquarters in North Texas.

The provider of water purification products to commercial and residential users has expanded its facility at 1920 Hutton Court, Ste. 300, in Farmers Branch to 13,026 square feet. The new location includes office space, a 4,710-square-foot manufacturing plant, and a training center.

The training center will house systems from each of Voltea's three product lines - DiUse, DiEntry and the Industrial Series - to give distributors, resellers and system integrators the opportunity to learn more about the products first-hand.

“We’re even further along than we had hoped to be when we opened our U.S. headquarters just two years ago, which speaks volumes about our industrious team and the disruptive technology we’ve developed,” Voltea CEO Bryan Brister said in a prepared statement. “Expanding our Dallas facility helps us continue innovating at a pace that is extraordinary in the water industry.”

In addition to growing its North Texas footprint, Voltea is hiring for several engineering and IT positions, which will bring it to 30 employees at its Farmers Branch office. To apply for one of the jobs, visit Voltea’s website here.

Volta also has an office in the Netherlands. Its investors include Unilever Ventures, Anterra Capital, Rabobank, ETF, IDO and Detlef Taprogge.

Company News | Events | Conferences | North America & Canada | Technology Focus

WaterBriefingGlobal at WEFTEC 2018 – a tale of parties, membranes, diamonds, coffee and zeolites

By **Alison Ireland** - October 12, 2018 182 0

weftec® the water quality event™

Voltea furthers patented Membrane Capacitive Deionisation (CapDI) process

After being named 'Breakthrough Water Technology Company of the Year' at the Global Water Awards in Paris in April, Voltea has furthered its patented Membrane Capacitive Deionisation (CapDI) process in launching DiEntry a new residential water treatment system intended to compete with in-house water softeners, while DiUse has seen strong growth picking up a contract with a major coffee shop chain.

Lower energy use than RO, and water quality 'tuning' are the attractions, the latter serving to guarantee the similarity of 'coffee experience' all over the world. Originally a Unilever company and backed by Rabobank, Voltea is currently looking for brand ambassadors and mass distributors. For any interested coffee vendors, CSO, Dewitt Dees will be at the European Coffee Symposium 2018 in Milan at the end of November!

Laundry and Cleaning News International
LCNi

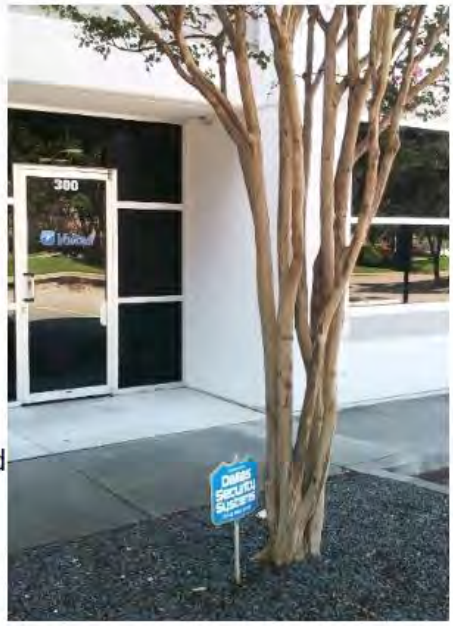
Voltea moves to larger headquarters

8 October 2018

Print Email

USA

Voltea, the global leader in membrane capacitive deionization (CapDI) water purification technology, has moved into a larger U.S. headquarters location as the company reports a 300% increase in global orders over the last 12 months. The new office, manufacturing plant and training centre in Dallas, Texas reflects the rapid growth of the company.



Voltea CEO Bryan Brister said: “Expanding our Dallas facility helps us continue innovating at a pace that is extraordinary in the water iindustry."

Two new water purification products sparked the increase in orders: point-of-use system DiUse, which is popular with restaurants and coffee shops, and point-of-entry system, DiEntry, which is designed for residential use. Voltea, which has a European office in the Netherlands, has seen increased sales in the U.S. as well as Europe, Asia and the Middle East.

FOODSERVICE EQUIPMENT reports

PRODUCTS: September 2018

September 1, 2018

HIGHER QUALITY BEVERAGES

Voltea's DiUse System, run with its CapDI technology, "tunably" removes salt and other minerals from water, allowing your operation's coffee, cappuccino and espresso to taste its best. DiUse softens and purifies brackish water sources such as municipal, tap and fresh water for commercial businesses at an advantage to traditional desalination technologies as a result of it being a salt-free, chemical-free, tunable alternative.

Voltea

voltea.com

Voltea's DiEntry electro-desalination system.

NEWS

Water desalination finds a home

Homeowners and builders are targeted for Voltea's DiEntry system

BY **HBSDEALER STAFF** August 13, 2018

The maker of electro-desalination equipment describes homeowners and builders as prime markets for water purification systems – especially in water-restrictive states like California.

Voltea, known for its membrane-capacitive deionization (CapDI) electro-desalination technology, launched its first residential-focused water purification unit, DiEntry.

DiEntry addresses the most pressing water issues in the market – quality, taste and waste – by using Voltea's energy-saving CapDI technology to "tune" water to meet the needs of the homeowner and community. This technology has disrupted an industry that relies on chemical additives.

"We're pleased to provide a transformative product for the residential market that is based on our industry-leading CapDI technology," said Voltea CEO Bryan Brister. "Home builders and homeowners will benefit from our experience providing water treatment solutions to some of the top companies in the world."

Voltea was recognized as the Breakthrough Water Technology Company of the Year at the 2018 Global Water Summit in Paris.

According to the company, DiEntry is also a "game-changer" for homeowners, who are increasingly interested in technology that facilitates a healthy and sustainable lifestyle. DiEntry provides homeowners control over the quality and taste of their water while reducing the environmental impact because it uses and wastes less water than other products. It can be perfectly tuned to provide on-demand purified water from all faucets of the home, every time, with no salt or chemicals.

Financial benefits to homeowners include long-term savings in water and energy usage as well as being in immediate compliance with community restrictions on water usage and runoff from traditional water softening systems.

For builders, DiEntry provides "customizable" and fundamentally better water within the home as well as better and less water discharged from the home. Its small footprint is easy to design and build around, as it needs less space than other residential water treatment systems.

Builders offering and installing DiEntry are positioning themselves as being on the cutting edge of technology for water purification. Plus, Voltea's network of support professionals are available for product and installation advice and instruction.

PRODUCT / JUL 19, 2018

VOLTEA LAUNCHES DIENTRY NEXT-GEN WATER PURIFICATION

By Nigel F. Maynard

Voltea, a company that specializes in desalination technology, has launched its first residential-focused water purification unit, DiEntry.

Perfectly suited to the water quality and environmental needs of high-end home builders and owners, DiEntry is a next-generation technology that leapfrogs any existing residential system, the company says.

The salt- and chemical-free water treatment addresses the most pressing water issues in the market – quality, taste, and waste, the company explains. DiEntry uses uses Voltea's membrane-capacitive deionization technology to "tune" water to meet the needs of the homeowner and community. As the company explains it, the technology has disrupted an industry that relies on chemical additives or so-called "soft" salt to treat water.

"We're pleased to provide a transformative product for the residential market that is based on our industry-leading CapDI technology," says Voltea CEO Bryan Brister. "Home builders and homeowners will benefit from our experience providing water treatment solutions to some of the top companies in the world."

For builders, DiEntry provides "customizable" and fundamentally better water within the home as well as better and less water discharged from the home, he company explains. And because of its compact size, it's easy to design and build around because it needs less space than other residential water treatment systems, the brand adds.

"Builders offering and installing DiEntry are positioning themselves as being on the cutting edge of technology for water purification," Voltea says.

The company says the product offers many benefits to homebuyers and homeowners as well.

"DiEntry provides homeowners unprecedented control over the quality and taste of their water while reducing the environmental impact because it uses and wastes less water than other products," the company says in an official statement announcing the release. "It can be perfectly tuned to provide on-demand purified water from all faucets of the home, every time, with no salt or chemicals."

Industrial WaterWorld®

IMPROVING THE SPREAD

July 1, 2018

Water treatment system helps margarine manufacturer reduce water consumption, costs

By Bryan Brister

New regulations and an awareness of the need for environmental responsibility have helped fuel the push for innovative water treatment solutions in a variety of industries. As a result, water treatment technologies such as electrodialysis reversal (EDR), ion exchange and membrane capacitive deionization have rapidly gained acceptance in the once-conservative commercial and industrial water treatment market. They are paving the way for water consultants and distributors to add more sustainable options to their product catalogs.

On site at Unilever in Pratau, Germany, for the CapDI IS2 System installation.

Because of the extensive amount of water consumed by certain sectors, businesses are taking every opportunity to reduce the amount of water used and are now looking for options that allow them to do just that. Cooling towers, specifically, are among the highest water consumers and also have some of the worst scaling and corrosion issues. When the equipment is not maintained properly, an even greater amount of water can be wasted.

One customer in particular was looking for an easy-to-use technology that required little maintenance and also had the ability to maintain a consistent quality output through any water quality spikes in turbidity. It decided to do away with its current water treatment plan in place of a newer, less traditional option.

A look into the internal panel box of the CapDI IS2 System, installed at the Unilever plant in Pratau, Germany.

MARGARINE MANUFACTURER FACES HIGH COSTS

Unilever, a margarine manufacturer located in Pratau, Germany, was using a large amount of water during its manufacturing process. The plant is located in a part of Germany known for its extraordinary water costs, which added urgency to finding a water treatment solution for its cooling towers.

In order to lower its water consumption, Unilever evaluated various water treatment solutions, including reverse osmosis (RO) and membrane capacitive deionization. Ultimately, the manufacturer determined that RO was not an efficient water treatment solution for its needs for a couple of reasons. First, RO produces ultrapure water as it removes all salt and total dissolved solids (TDS), which can have a negative effect on a cooling tower and steel pipes. In fact, it's very common for water treated with RO to actually corrode steel pipes because the water can remove the iron from the pipes and neutralize itself.

Figure 1. Average Recovery

Second, water with a very low salt concentration is considered unbalanced and will naturally attempt to take in salts from other sources to balance itself out. This type of corrosion eats away at valuable equipment and causes structural damage to cooling operations.

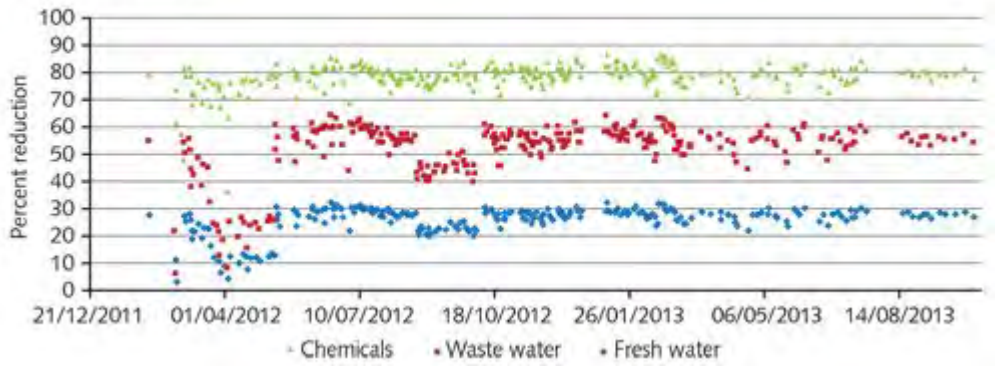
And finally, a typical RO system will be accompanied by a water softener to place soft salts back into the water stream where the majority of the hard salts have been removed. This piece of the process unfortunately also causes issues within cooling towers as it produces a higher concentration of salt that is used within the cooling loop. When there is evaporation, that salt is left behind and causes unnecessary corrosion and scale, often leading to more water consumed.

MEMBRANE CAPACITIVE DEIONIZATION

Unilever opted for Voltea's Membrane Capacitive Deionization (CapDI©), a salt-free water purification technology wherein salt ions and TDS are removed via an electrical current. In a simple two-step process, positive ions are attracted to the negative electrodes while negative ions are attracted to the positive electrodes to create a stream of pure water flowing out of the system. When the ions are fully saturated, they flip polarity, where these ions are then discharged.

The sustainable and environmentally responsible feature of this process is that there are never any soft salts added to the system to replace the hard salts that were removed. This allows the same salinity and mineral level that was in the original water source to be discharged without additional, higher salt levels. Traditional water softeners, where hard salts are replaced by soft salts, have been banned in some municipalities, especially those struck by drought or those that have made environmental concerns a priority.

Figure 2. Savings



CUSTOMIZABLE TECHNOLOGY

Membrane capacitive deionization is tunable, which means the user can customize the desired level of salt or TDS removal based on the application. In a traditional RO process, all of the salts and TDS are removed, which then requires a water softener to re-salt the water back to the original desired level of salinity. This pressurized process not only requires a higher level of energy but results in a higher level of salts being discharged back into the environment.

The tunability feature removes unnecessary extra steps in the treatment process while eliminating a high concentration of salt in the discharge water. Membrane Capacitive Deionization also allows the reduction of chemicals, water consumption and wastewater for a quantitative analysis of savings.

QUANTIFIABLE RESULTS

After a year and a half of operational data at the Unilever facility, the CapDI System produced notable results, including:

- A 26 percent reduction in fresh water consumption
- More than 50 percent decrease in wastewater
- A 78 percent reduction in chemical consumption

This example illustrated that, for Unilever, membrane capacitive deionization proved to be a more environmentally responsible option for water purification for cooling towers than traditional water treatment systems such as RO.

It also yielded significant cost reductions in water and chemical costs, saving about $14,000 with an ROI of just over six months of operation. This data stayed consistent through this operational period while the water recovery of the CapDI System maintained an average of 83 percent. **IWW**

@bio:About the Author: Bryan Brister is CEO of water technology company Voltea. Prior to joining Voltea in 2014, Brister spent eight years with General Electric and was as a founding member of Seven Seas Water. Brister holds a bachelor's degree in biochemistry and a Ph.D. in polymer science and engineering.

Podcast: Voltea discusses its water treatment technology

FoodBev's Jesús Luna-Lopez spoke with Voltea's chief sales officer Dewitt Dees about the company's electric water treatment technology at the Water Quality Association Convention & Exposition 2018.

Voltea's innovative CapDI water deionisation technology is designed to remove dissolved salts from water using electricity, and the process is suitable for tap water, industrially processed water and even brackish groundwater.

Dewitt claims that this process is more environmentally friendly than other water purification techniques, as he says the process consumes less energy and utilises fewer chemicals than other processes.

Dewitt also discusses the company's DiUse technology, a miniaturised version of its CapDI system suitable for point-of-use applications.

Voltea wins Global Water Award 2018 for its CapDI breakthrough technology

Posted on 20 April 2018

Established in 2006 by Global Water Intelligence, the Global Water Awards recognise and reward those initiatives in the water, wastewater and desalination sectors that are moving the industry forward.

Exciting times for water sector

During the opening ceremony, British TV presenter Claire McCollum, reflected on the development of the water sector in 2017 highlighting the importance of innovations for the transformation of the global water sector to further improve its performance.

Happily surprised CEO Bryan Brister (left) of Voltea at the Global Water Summit in Paris.

"It is an exciting time for the international water industry, with some of the most significant opportunities the water sector has seen in a decade presented on the agenda for this year's conference. It heralds a new paradigm for the water industry as the arrival of new technologies, businesses and sources of finance are empowering the water industry to rethink the way it does business", McCollum said.

Breakthrough as a company

2017 was an exceptional good year for Voltea. It saw it's capacitive deionisation (CapDI) technology take off as one of the most successful alternatives to reverse osmosis in recent years.

Voltea gained significant market traction in the industrial and commercial sectors, with over 100 systems being shipped.

The company also closed a 10 million US dollar funding round to further accelerate its growth, and brought the full capacity of its robotic module assembly plant in Dallas online.

In 2010 the company also received a award at the Global Water Summit but then as a winner of The Water Technology Idol Competition.

At the summit in Paris, Leading Utilities of the World (LUOW) network introduced five new members, including Dutch water utility PWN Noord-Holland. CEO Joke Cuperus (second left) was one five to receive the Golden Tap trophy for new members.

Disruptive technology

"We're extremely grateful to be recognized by GWI for our disruptive technology, which has transformed the way many industries treat water," said Voltea CEO Bryan Brister. "Our salt-free, chemical-free technology is being used by some of the top companies in the world for a variety of uses, from cooling towers to point-of-use water treatment for coffee and fountain drinks."

Voltea's industrial and commercial CapDI systems run with patented CapDI technology, which monitors incoming water quality in real time, and self-adjusts performance to ensure it delivers consistent, precise water quality.

About Voltea

Supported by multinational Unilever, Voltea started in 2006 to develop its capacitive deionisation (CapDI) desalination technology in the Netherlands.

Last year Voltea opened its production facility in Texas, USA about 18 and now has about 30 local employees and continues to grow.

Its CapDI technology recently outperformed RO and electrodialysis at a municipal pilot in Colorado, potentially paving the way for a full-scale contract involving a 18,168m3/d plant.

MODERN RESTAURANT MANAGEMENT

JANUARY 7, 2019

that handles recruiting, hiring, training, development, compliance, performance management, benefits, people systems and community engagement. Prior to joining MOD, Megan spent four years at Outerwall, where she was Vice President of Talent Management for the Coinstar and Redbox brands, and seven years as Human Resource Director for Frog Design.

Reinventing the Water Fountain

PepsiCo has created an innovation pipeline that is "reinventing the water fountain" to be more in line with how consumers are hydrating on-the-go today. As consumer water consumption and the use of refillable bottles continues to increase –particularly on campus and in the workplace– the test of Aquafina Water Station is an effort to learn more about consumer preferences and needs in these channels.

Aquafina Water Station enables consumers to dispense customized water options, including flavors like peach or raspberry lime, sparkling or still water, into refillable personal containers. We are thrilled to collaborate with Penn State to give consumers access to the new equipment and to gather learnings that will enable us to ideally make it accessible to more consumers in the future.

Voltea, the global leader in electro-desalination water treatment technology, is seeing strong interest from hotels, restaurants and cafes in its new, point-of-use DiUse® system for coffee, fountain drink and drinking water applications.

With DiUse, incoming water is "tuned" to the ideal salinity to match the application, and remains perfectly tuned even through variations in incoming water characteristics. DiUse is considered point-of-use because the system is installed at the point where the water source is connected to the equipment.

"Even municipal water quality varies, so the ability to deliver water that is pure with a consistently tuned taste profile regardless of these variations is tremendously valuable," said Voltea CEO Bryan Brister. "DiUse water is perfectly suited to the application, such as water for consistently great coffee, tea or fountain drinks. We're proud to see world-renowned establishments in Europe, the United States and beyond use DiUse to improve the quality of the beverages they serve."

DiUse is a miniaturized version of Voltea's industrial and commercial CapDI© systems, which run with patented CapDI technology. The system monitors incoming water quality in real time, and self-adjusts performance to ensure it delivers consistent, precise water quality with improved taste.

The salt-free, chemical-free technology is a simple, two-step process wherein water flows between electrodes. The electrode surfaces are separated from the water by ion-selective membranes that allow positive or negative ions (salts) to pass. The system is tunable, allowing adjustable salt removal and continually adjusts to account for any fluctuations in feed water characteristics.

"Best-in-class hotels, restaurants and cafes are notoriously demanding when it comes to consistency of the customer experience—whether that is the perfect cup of coffee or tea, or a refreshing fountain beverage. Their embrace of Voltea's DiUse system is proof positive of its efficacy," concluded Brister.

Other applications for Voltea's DiUse system include:

- Personal use water in smaller residential spaces, such as apartments
- Grocery store misters
- Mist cooling systems
- Spot-free rinse for solar panels, vehicles and dishwashers

CIA Teaching Kitchen

The Culinary Institute of America (CIA) at Copia is now offering hands-on cooking experiences for home cooks and professionals in its new 9,000 square-foot state-of-the-art kitchen. A much-anticipated part of CIA at Copia, the teaching kitchen serves as a hub for public hands-on cooking classes, interactive dining events, industry conferences, and private events.

Located on the second floor of CIA at Copia, the gleaming new kitchen is outfitted with six Hestan cooking suites and equipment. The custom-made Hestan cooking suites were designed in pairs so that two suites comprise one cooking area. Each cooking area can accommodate 16-20 people at a time for a hands-on cooking exercise, with maximum capacity set at 125 for a dining event.

"We could not be happier with the design of the space and the inaugural event with *Food & Wine* Magazine," says Thomas Bensel, managing director of the CIA's California campus. "We hope to see many more happy faces experiencing this unique teaching kitchen."

HoReCa Industry Embraces Voltea's New Water Treatment Technology

March 29, 2018 | Industry News

Voltea, the global leader in electro-desalination water treatment technology, is seeing strong interest from hotels, restaurants and cafes in its new, point-of-use DiUse system for coffee, fountain drink and drinking water applications.

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tea, or a refreshing fountain beverage. Their embrace of Voltea's DiUse system is proof positive of its efficacy," concludes Brister.

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- Grocery store misters
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RELATED POSTS

Scaling Restaurant Sustainability: 3 Steps for Green

HoReCa Industry Embraces Voltea's New Water Treatment Technology

By **Voltea** - March 22, 2018

DiUse system

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Water Quality Monitored in Real Time

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Other applications for Voltea's DiUse system include:

- Personal use water in smaller residential spaces, such as apartments;
- Grocery store misters;
- Mist cooling systems; and
- Spot-free rinse for solar panels, vehicles and dishwashers.

Voltea