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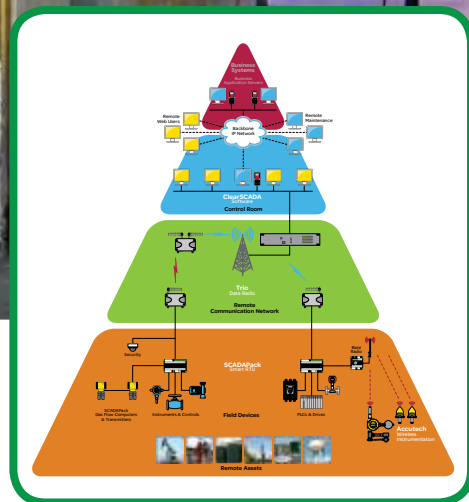
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Clint Rogers

New logo, new website, same WEAU

What a fantastic Mid-Year Conference! Thanks for all who were able to attend, and who prepared presentations. Special thanks to our Mid-Year Conference Planning Committee Chair Brandon Wyatt and the following committee members: Jeff Beckman, Tiffani Adams, Tom Holstrom,

Chris Reilley, Marianka Sochanska, Rob Jaterka, Brent Packer, and Jeremy Deppe. Volunteers are what makes WEAU go, and the success of the Mid-Year Conference is a prime example. I'd also like to thank those volunteers to who helped with the lunch presentations.

Let me highlight a few items for those that were not able to attend. WEAU has a new logo. Hopefully you have enjoyed this fresh look in our publications and on our website. This came about as a result of WEF our parent organization asking that we move their wave



“ Initial feedback is that WEAU is better as a result of their efforts. Check it out www.weau.org.



symbol out of our main logo. Done. Again hopefully you like it! More pins and stickers will be available at the annual conference.

WEAU has a new website. Dave Hatch (Treasurer), Giles Demke (Vice President), and Greg Stevens (Webmaster) have been at work to launch a new website. Overall goal has been to make info more accessible, improve our ability to send email, and take the pain out of the registration process. Initial feedback is that WEAU is better as a result of their efforts. Check it out www.wEAU.org.

Perhaps the number one question we get related to email and the Digested News is this: "why am I not getting them?" We know this is a challenge for many, and its tough for us as all membership information is managed by our parent organization. So if you are getting this but know of a co-worker or friend that isn't getting the emails or publications please share with them the following:

WEF Web Site www.e-wef.org

Click on the "Login" link at the top of the page Enter your "User Name" and "Password" There are links on this page if you have forgotten any of the information. You can also contact WEF by phone 1-800-666-0206. After you have logged in, you can verify and/or change information about your account by clicking on the "My Account" tab.

You can edit information by clicking the "Edit" button for each category.

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For the keynote presentation this year the focus was on the value participation in WEAU and WEF, and a celebration of the water legacy we are leaving as water stewards. We showed a video on the WEF website called #MyWaterLegacy that was created as part of a national marketing campaign targeting the value of water and the unsung heroes of our industry that deliver clean water back to the environment. The WEF video was followed by a couple of videos created by the WEAU Board on this same theme of a water legacy. I hope you check them out on our website and share them with family, coworkers, your boards or city councils, and your customers. Special thanks again to Lance Wood, Rob Jaterka, Jeff Beckman, Matt Garn, and Jill Jones for each addressing benefits of WEAU involvement.

Time to shift our focus to the Annual Conference in St. George, April 17-20, 2018. Hope to see you there, make your plans early to attend and get involved. [DRI](#)

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WEAU's vision

Chad Burrell

This year at the Midyear Conference Clint Rogers gave time to several members to talk about several subjects related to the WEAU. We were also reminded of the organizations Vision Statement. It was great to hear from these individuals and be reminded of the reason that we are members, why it is important to be involved, and the ways in which WEAU can help us as individuals and help the organizations we work for. It truly is a great resource.

WEAU Vision Statement:
The Water Environment Association of Utah is dedicated to the professional growth of its members and the preservation and enhancement of the water environment.

Lance Wood Discussed: How does the WEAU help you engage and train your operator staff?

Rob Jaterka Discussed: How does participation in the operations challenge help individual operators?

Matt Garn Discussed: How does WEAU help foster constructive relationships between POTWs and State Regulators?

Jeff Beckman Discussed: What are the networking benefits of being involved in WEAU?

Jill Jones Discussed: How does WEAU benefit from being part of WEF? Are there things we can do to share our strengths with WEF? [Dn](#)



Clint Rogers



Jeff Beckman



Jill Jones



Lance Wood



Matt Garn



Rob Jaterka



Is all grit created equal?

Conventional design guidelines specify that treatment plants target removal of solids larger than 210 μm , but wastewater grit can be as small as 50 μm . If you're not removing fine grit then you're paying for it in abrasion damage, clogging and increased maintenance.

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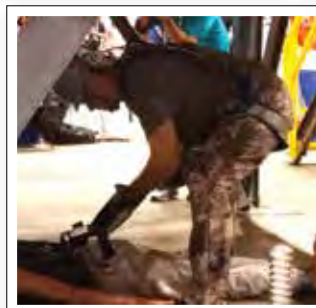
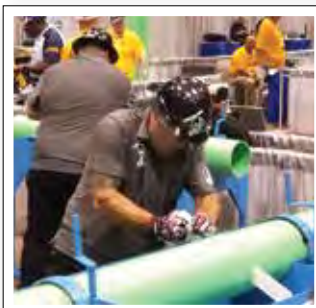
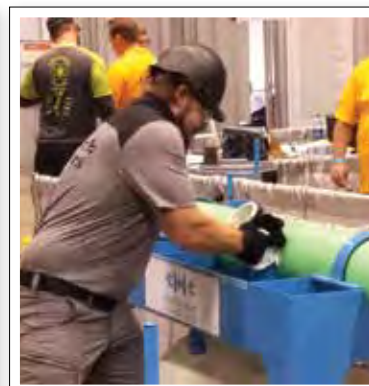
WEAU sends three teams to WEFTEC

By Rob Jaterka, PWO Rep WEAU

This year WEF gave Utah the opportunity to send three teams to compete at WEFTEC in Chicago. After our state competition, Central Valley's team Wasted Gas won the honor of representing Utah. Two teams were compiled with operators from teams that competed in St. George. Central Weber, Snyderville, Cottonwood, and Magna all sent two competitors to make up the Wasatch All stars and the Mountain West Elite. A giant thankyou goes out to these entities and their board members for their support. As competitors, we can never thank our management enough for the support we are shown.

With 37 teams fighting to win the five-different events competition was steep. For those of you who are not familiar with this, the five events are safety, collections, maintenance, lab, and process. All three teams did a great job of representing our awesome state. Wasted Gas placed third in lab and 5th overall. These guys missed third in process by only 15 points. Wow. Congratulations guys. Wasatch Allstars placed 2nd in maintenance and 17th overall. Congratulations guys. The Mountain West Elite placed 18th overall. Congratulations guys. It was awesome to watch these guys give it their all.

Another aspect to see was the amount of people from Utah that were there to judge and help with the competition. This makes you proud to say you are from Utah. The amount of support the WEAU as an organization gives to this is spectacular. As I wondered around WEFTEC more than a few people from other states let me know how amazed they were that our organization shows so much support. You know, we are really lucky to have so many people in our industry willing and eager to lend a hand. Every member of the WEAU should hold their head high and walk proud. I would like to thank every member for making our organization the greatest MA out there. 



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Operator Spotlight Q&A with Josh Hunsaker (Central Valley Water Rec)

Tell us a little about yourself.

I am a life long resident of Utah and graduated from Judge Memorial High School. Married to Miki Hunsaker and together we have three children. I have a beautiful 18 year-old daughter Savannah, and two wonderful boys 14 year-old Tayden and 13 year-old Mayson. I love spending time with my family. My wife and children are the driving force behind everything I do. We love to vacation, hunt, play on our ATVs, and do pretty much anything outdoors. I coach my two sons in baseball pretty much year round.

What drew you to CVWRF (Central Valley Water Rec.) originally?

I wanted to be an electrician and was venturing into an apprenticeship program. At the time I was severely struggling to find companies wanting to hire someone with little to no experience. I have grown up around many fine leaders in the wastewater world and decided that maybe I should take a closer look at that field. Everyone I knew had made a great life for themselves. So I decided to shift gears and follow their footsteps. Central Valley was the direction from all my references.

And how has CVWRF changed since?

I have worked at CVWRF for 13 years. A lot has changed. Staff changes have been the biggest changes I have seen. The only real big process change would have been our disinfection from CL2 to UV. But we are about to undergo a dramatically huge change plant wide.

What is your role at CVWRF?

I am certified as a grade 4 DRC treatment operator and grade 3 mechanic. I'm currently an operations supervisor over the biosolids department.

What has been your favorite project at CVWRF?

My favorite project would be the solids contact aeration upgrade.

What have you gained most from working at CVWRF?

Leadership.



“ I love spending time with my family. My wife and children are the driving force behind everything I do.

What is your favorite part about working for CVWRF?

Central Valley is a big facility with a lot of equipment. My days are usually different and I am always learning something new.

What is your proudest moment at CVWRF?

CVWRF had a CL2 leak near the rail cars. My partner Mike Hyre and I donned hazmat suits and SCBAs (self-contained breathing apparatus). We had the leak contained in a very short amount of time. Mike Hyre and I were recognized and praised by the CVWRF and the EPA. This was one of the scariest days of my life and one of the proudest moments.

Do you have an office nickname? What is it?

I have had several nicknames at CVWRF some of them not so PG but I think my

favorite is FJ. If you would like to know what it stands for come see me in person

What advice would you give to recent new hires?

CVWRF is a great opportunity to learn and grow in a field that is constantly changing and evolving to continue to improve the quality of our waterways. CVWRF is career material if the right passion and energy is put into it.

What are three career lessons you've learned thus far?

Be honest in every aspect of life. Hard work and dedication will take you far.

Don't take for granted the little troubles a normal job can have, because a bad day at CVWRF probably means I got a little dirty.

When did you first compete in the operations challenge?

2008 was the first time I had the pleasure of competing in the Operations Challenge.

What has competing in the operations challenge done for you and your career?

It has taught me the importance of team building and patience. It has also taught me that comradery is important and can help out in many ways.

How many times have you won locally and how many times have you gone to nationals?

Locally eight times and competed nationally five times.

What is your favorite memory about the operations challenge?

The first time our team won in St. George was probably the most memorable for me and many others.

Three words to best describe you:

Dedicated, Motivated, Blunt.


Tell us something about yourself that would surprise us.

I struggle holding back tears when my kids do things they are excited about. Makes it difficult at times to coach baseball when I am crying like a baby.

I am very proud of my kids.

Top three life highlights?

Marriage and children, taking my family to Hawaii, My career.

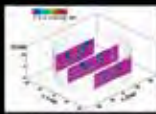
I have been working with Josh for the last 13 years. Josh and I have worked and competed on many projects and operations challenge teams. Josh is a very family orientated man. His family always comes first. Josh is they type of person that will do what it takes to get the job done. He is not the type that will wait around for other people to do it. Over the years I have watched Josh grow from an operator trainee to his current position as the Bio-solids supervisor. I have no doubt that Josh will continue to be successful no matter where his future may take him. It has been an honor working and growing with Josh over the years. Good job my friend. Keep up the great work. 



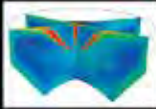


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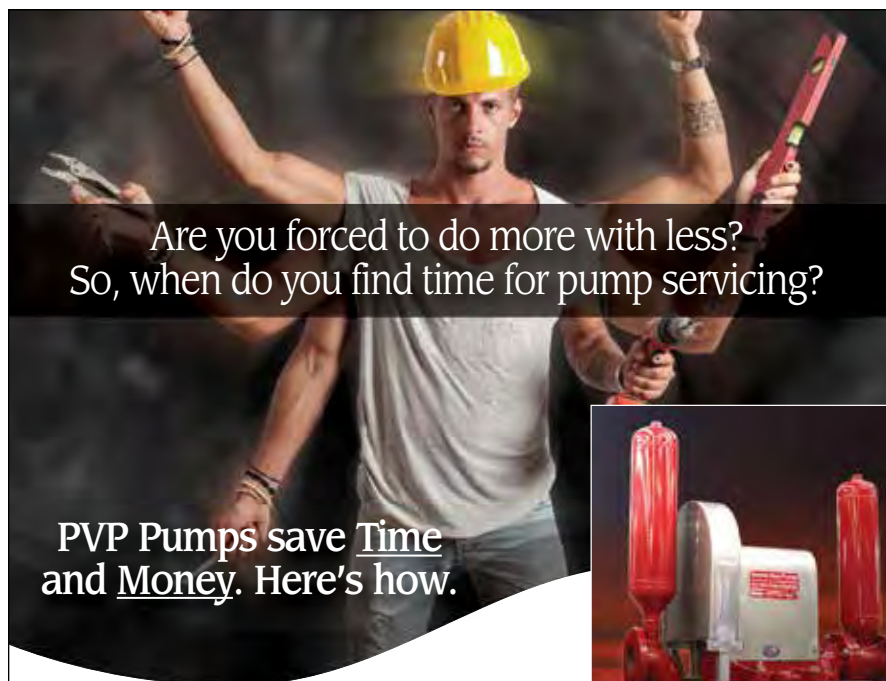
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Winter 2017 Quiz

By Rob Jaterka, PWO Rep Elect

- In most activated sludge facilities, oxygen requirements are met when the DO is equal to or greater than?**
 - 1 mg/l
 - 2 mg/l
 - 3 mg/l
 - 4 mg/l
- Which of the following classes of compounds are NOT toxic to activated sludge microorganisms?**
 - Metals
 - Heavy metals
 - Pesticides
 - Carbohydrates
- Polymers provided in the following form are slippery and may irritate the eyes, nose, and skin.**
 - Powder
 - Granules
 - Gel
 - All of the above
- Calculate the water horsepower for a pump delivering 875 com against 118 feet of head.**
 - 101 hp
 - 55 hp
 - 7 hp
 - 26 hp
- A 40 hp pump runs for 18 hours per day and is 85% efficient. How many kw hours were used in a day?**
 - 631.9 kw hrs
 - 537.1 kw hrs
 - 489.7 kw hrs
 - 746 kw hrs
- 750 cu ft of wastewater is how many gallons?**
 - 7,480 gallons
 - 8340 gallons
 - 5,610 gallons
 - 6,510 gallons



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ANSWERS:

1. B 2. D 3. D 4. D 5. A 6. C

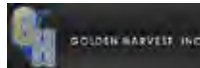




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UTAH 2015,
2016, 2017

Tony Hale Wins Ingenuity Award

Problem:

Unable to chemically treat roots in large diameter pipe
(Cottonwood Improvement District sewer line diameters range from 6” – 44”)

Solution:

- (a) Created a nozzle tip that sprays the chemical instead of forming a slug.
- (b) Created an adjustable skid body and self leveling spray tip.

Results:

- (a) These inventions nearly cut our treatment cost in half.
- (b) Gave us the ability to spot treat root sections.
- (c) Gave us the ability to CCTV while treating roots.
- (d) Gave us the ability to treat any size pipe diameter for the same cost.
- (e) By being able to spot treat roots less chemical used is much safer for your district and your treatment facility.

These inventions were not only nominated for an ingenuity award but won at WEFTEC 2017. [DRI](#)



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Working Safely in Cold Weather

By Jonathan Gubler

1. **What are 2 of the 4 factors that affect an individual's reaction to cold weather?**
2. **What percent of body heat is lost through the head?**
A. 75% C. 40 %
B. 60% D. 25 %
3. **The first thing you want to do for someone suffering from frostbite?**
4. **You should vigorously rub frostbitten skin to warm it.**
True or False
5. **What is hypothermia?**
6. **Should you double up your socks, or wear the thickest socks you can find to protect your feet?**
True or False
7. **What is the recommended layers of clothing to wear in cold weather?**
A. 5 C. 3
B. 4 D. 2
8. **Should you avoid drinking liquids when working in cold weather?**
True or False
9. **If you are going to drink liquids, what types are best on cold weather days?**
10. **What type of drinks should you avoid when working in cold weather?**

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- ANSWERS:**
1. Age, Health, physical Condition
 2. C. 40%
 3. Move them to a warm environment
 4. False, the skin can have ice crystals in it and when rubbed can cut the cell walls.
 5. The condition of having an abnormally low body temperature, typically, one that is dangerously low.
 6. False, you need wiggle room.
 7. C. 3, a base layer such as thermal underwear, an intermediate warm layer (wool or down) then a weather proof top layer.
 8. No, you need to stay hydrated even in cold weather.
 9. Warm juice, cocoa, water.
 10. Alcohol and caffeinated drinks.

2017 WEAU MID-YEAR CONFERENCE AWARDS

Stockholm Junior Water Prize Participant Award:

- Divyam Goel

Dr. Okey Scholarship Award:

- Michael Navidomskis

WEAU Operator Scholarship:

- Jonathan Gubler, *Cottonwood Improvement District*
- Scott Brown, *Cottonwood Improvement District*
- Jeremy Deppe, *Central Valley WRF*

Midyear Student Presentation:

- Sunayna Dasgupta

WEF Ingenuity Award:

- Tony Hale: aka “The Root Assassin”
Cottonwood Improvement District

**2017 WEF Student Design Competition Project,
Water and Sewer Expansion Magna Water District:**

- Heather Chritiansen
- Collin Miller
- Jenny Calderon
- Dani Zebelean

2017 WEFTEC Ops Challenge Teams:

- Central Valley Wasted Gas
- Wasatch Allstars
- Mountain West Elite



2017 WEFTEC Ops Challenge Teams



Michael Navidomskis



Scott Brown



Jeremy Deppe



Sunayna Dasgupta



Tony Hale



Jonathan Gubler



Divyam Goel

Are your Clarifiers in Balance?

BY PAUL KRAUTH, P.E.

The most important finishing step in wastewater treatment is solids separation. As Utah moves to higher levels of treatment the solids in your effluent will become more important. Typically, this is done by gravity settling using clarifiers. Gravity settling is a numbers game, as long as a majority of the solids have a downward velocity great than the upward velocity created by the overflow rate. Then the solids will eventually reach the bottom of the clarifier. It is helpful to think of overflow rates as a velocity.

$$SOR = \frac{GPD}{ft^2} \rightarrow \text{convert GPD to } \frac{ft^3}{s} \rightarrow \text{rewriting } SOR = \frac{\frac{ft^3}{s}}{ft^2} \rightarrow SOR = \frac{ft}{s}$$

It is standard practice to try and balance the surface overflow rates if you have more than one clarifier in service. While this may be a hydraulic balance, it does not take into account the solids loading. The solids loading maybe more critical in the activated sludge process than other process. There are two ways to check this loading.

1. Equipment needed

- Sampling equipment (can use bucket on a rope)
- Flow measuring device on each clarifier
- Method for measuring TSS
(vacuum filter, dry oven analytical balance)

Sample the MLSS from the feedwell of each clarifier. Measure the flow into each clarifier (it is import to do this simultaneously). Calculate the solids loading using the calculate overflow rates, and the solids concentrations.

The limitation of this method is that it requires laboratory results of MLSS concentrations, and accurate flow measurement from each clarifier. Small to medium size facilities may not have easy access the needed equipment.

But you can do a visual check

2. Equipment needed

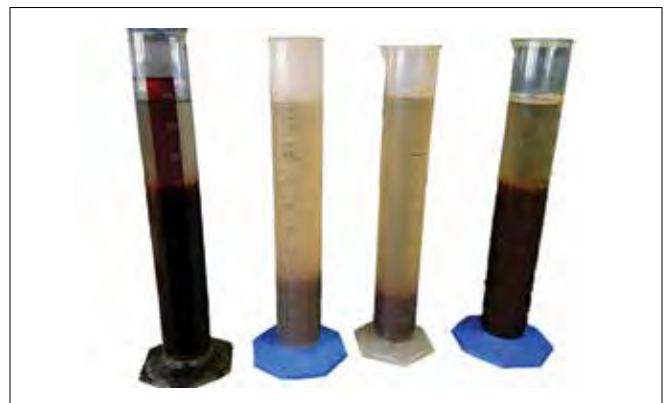
- Sampling equipment (can use bucket on a rope)
- Graduated cylinders
(one for each clarifier, ideally 1 liter or larger)

Sample the MLSS from the feedwell of each clarifier (again it is import to do this simultaneously). Remix the samples and pour into cylinders (again simultaneously). After 30 minutes observe the settled sludge volume.

The limitation of this method is that it assumes the MLSS have the same settling rate (no floc shear occurring between flow splitter and the feedwell). Again, it is just a quick visual check.

If you want a quick check on how your clarifier are being loaded, you might want to try the visual method. [DA](#)

The results of a visual imbalance test run at a plant with four clarifiers.



Brigham City

WASTEWATER TREATMENT PLANT TOUR

By Andrew Hobson


In October, the Young Professionals Committee organized a tour at the Brigham City Wastewater Treatment Plant. The tour was hosted by Rich, the plant manager. Lunch was provided to about a dozen people while Rich described the plant and how it treated the community's wastewater. After lunch, Rich led the tour through the treatment plant processes while discussing ways he has improved the quality of the effluent by small changes in his treatment. He went on to talk about the challenges of running a compost process when public demand is low after a wet year. He even took the time to show the group how to use a sludge judge! Thank you for your time, Rich! 



Figure 1. Tour of the Brigham City WWTP headworks facility.



Figure 2. The group hears how the facility uses biological phosphorus removal to achieve < 0.5 mg/L total phosphorus.



Figure 3. Rich shows the group how to use a sludge judge.

WASTEWATER



DIMITAR DILKOFF via Getty Images



WHY SHOULD WE CARE?

BY KEN BURGNER

In a recent Huffington Post article entitled, *"The Oceans Are Drowning In Plastic-And No One's Paying Attention"*, the concepts of land and water pollution and the potential effect on animal, humans, and plants was discussed. This is a concept that the media is discussing more often, but still isn't getting the attention it deserves.

"Discarded plastic bottles and other garbage blocks the Vacha Dam, near the Bulgarian town of Krichim, on April 25, 2009. Single-use plastic containers like bottles and plastic bags are "the biggest source of trash" found near waterways and beaches, according to the nonprofit Ocean Conservancy."

"Imagine an area 34 times the size of Manhattan. Now imagine it covered ankle-deep in plastic waste – piles of soda bottles and plastic bags, takeout containers by the mile, drinking straws as far as the eye can see.

That's a total of about 19 billion pounds of garbage. And according to one of the best estimates available, that's how much plastic waste ends up in our oceans every year.>



HUFFINGTON POST



HUFFINGTON POST



WEDNESDAY,
MAY 28, 2008
NDS
INFLUENT
(KEN BURGNER)



©ZAK NOYLE/A-FRAME

VARIOUS ITEMS
COLLECTED
AT THE NDS
INFLUENT
(KEN BURGNER)



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“We’re being overwhelmed by our waste,” said Jenna Jambeck, an environmental engineer who led the 2015 study that determined this staggering number. According to Jambeck’s research, this figure is on track to double by 2025 unless something is done, swiftly and at a global scale, to stem the tide of garbage.”

It’s not just the sheer volume of missed place garbage; it has other problems associated with it as well. Animals are consuming the plastics directly and contacting them indirectly which is having a direct effect on many amphibians, fish, mammals, reptiles, and waterfowl. Whether it causes a slow death by starvation or causes the body to be

malformed or strangulation, it minimizes an organism’s ability to thrive.

For the human population it has other, not so easily visible, implications.

“In 2012, photographer Zak Noyle captured the Indonesian surfer Dede Surinaya surfing in waters choked with trash off the coast of Java, Indonesia.”

“For now, the potential risks to human health posed by this plastic consumption are not totally clear – although preliminary research suggests some plastics could be toxic to humans, and could potentially increase the risk of cancer and liver damage, reproductive problems, and other negative health effects.”

What does this have to do with the North Davis Sewer District (NDS) or any other

sewer or water district? Five times a week we have garbage or trash collected at the influent or from other places in the plant that needs to be collected and delivered to a landfill. A large portion of this is sanitary wipes and plastics. Although the packaging for sanitary wipes say, they are biodegradable, these still don’t break down in hours or days. This may take months or years. Plastics take much longer, maybe centuries to millennia.

We need to educate our citizenry, clients, voters, humans, how to properly dispose of these wastes, so we minimize our impact on the earth. As we better understand this great earth that we live on, we can become better stewards of it. [DM](#)



2018 WEAU BUYERS' GUIDE

Welcome to our *Digested News* Buyers' Guide. On the following pages, you will find information that will help you meet your purchasing requirements throughout the year ahead. This four-page guide lists categories of products and services, along with the various companies that can provide them to you, followed by an alphabetical listing of each company and contact. All companies listed in this Buyers' Guide are advertisers in this issue of *Digested News*.

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Utilities Acting on Climate Change



Earth's land, oceans, and troposphere have been warming for many years. Projections for the U.S. from the 2014 National Climate Assessment include not only an increase in temperatures, but also other climate changes, such as an increased intensity of droughts in the Southwest and of heat waves and precipitation events throughout the U.S. Precipitation events also are projected to become more frequent.

Climate change risks are not limited to the U.S. Among the many risks projected globally by the Intergovernmental Panel on Climate Change (IPCC) are “drought, water scarcity, sea level rise and storm surges” for urban communities and “water availability and supply” for rural communities, according to IPCC’s *Climate Change 2014*:

Synthesis Report. The full report can be obtained at www.ipcc.ch/report/ar5/syr.

Water is likely to be further affected by climate change as precipitation patterns change, sea levels rise, and water quality degrades. In the U.S., the drinking water and wastewater infrastructure already requires significant investment to maintain current levels of service over the coming decades. The effects of climate change may significantly stress critical infrastructure further.

However, climate adaptation strategies can help mitigate climate change effects. Many municipalities already are assessing and implementing measures to build resilience to climate change. Their work provides examples of what adaptation measures can achieve.

Declining water resources due to drought

In the Southwest, Albuquerque, N.M.; Bernalillo County, N.M.; and the Albuquerque Bernalillo County Water Authority (ABCWUA) have demonstrated that relatively low-cost measures can be effective in adapting to drought conditions. Albuquerque and Bernalillo County began a conservation program in 1995 to deal with drought issues. In 1997, they developed a Water Resources Management Strategy that they update every 10 years.

The programs and ordinances undertaken at ABCWUA focused on residential areas and public buildings. They encouraged water-conserving landscaping and water-efficient appliances in new

development. According to the U.S. Environmental Protection Agency (EPA) report, *Smart Growth Fixes for Climate Adaptation and Resilience: Changing Land Use and Building Codes and Policies to Prepare for Climate Change* (EPA 231-R-17-001), ABCWUA gives rebates on the purchase of high-efficiency toilets, encourages xeriscaping (a type of landscape design for areas susceptible to drought), and touts compact development as examples of the measures instituted. As a result, residential customers achieved great reductions in water usage.

In 2014, ABCWUA programs shifted more of the focus to non-residential customers. The water authority adopted four programs, according to their document, *2024 Water Conservation Plan Goal and Program Update*. ABCWUA updated building codes, modified the xeriscape program in several ways to include a larger rebate to some non-residential customers, created a cooling tower rebate program, and offered assistance to new low-income customers with water auditing and water-conserving fixture installation.

Minimizing potential flood effects

Parts of Kansas City, Mo., are at risk of flooding from rivers and streams. As of early 2017, more than two thousand structures sit in Kansas City's 100-year floodplain.

Enter, the Wet Weather Solutions Program, which provides for street and sewer infrastructure upgrades, as well as an increase in green infrastructure use. Two of this program's goals are to reduce flooding and increase in water quality. The shorter-term projects of the program's overflow control plan will be completed between 2010 and 2020. Major changes will be finished by 2035.

For example, the Middle Blue River Basin pilot project, which improved streetscapes through the inclusion of green infrastructure solutions was completed in 2012.

By its end, the overflow control program seeks to reduce the estimated sewer overflow by approximately 15 billion L (4 billion gal) per year, thereby reducing cleanup, damage, and grey infrastructure costs, according to Kansas City Water Services.

Looking internationally, in Tokyo, Japan, heavy rains often lead to flooding, and increased urbanization has decreased the amount of permeable ground. In 2015, Tokyo completed an upgrade to the Tokyo Amesh, its rainfall information system. As described in the article, "Reconstructed Tokyo Amesh system crucial to flood prevention" in the Spring 2017 issue of *WorldWater: Stormwater Management*, rainfall radars were improved by upgrading to X-band multiparameter radars. These radar systems offer improved collection of rainfall data due to wave polarization. Information gathered from both radar and rain gauges is used by centrally located operators in determining pumping requirements for individual pumping stations. The Tokyo Bureau of Sewerage plans to continue improving radar capabilities and to increase the capacity of sewer facilities to handle up to 60 mm of rain per hour.

Sea level rise

A report by The Union of Concerned Scientists, *When Rising Seas Hit Home Hard Choices Ahead for Hundreds of US Coastal Communities*, estimates approximately 85 coastal communities

in the U.S. are at risk from chronic inundation, and the number of at-risk communities is expected to roughly double by 2035. Miami, New Orleans, and San Francisco are among municipalities implementing adaptation plans for sea level rise (SLR).

The City of Miami has monitored the risks of flood and saltwater intrusion for years. SLR affects flooding and saltwater intrusion risks. Among many projects underway to aid in adapting to climate change is the construction of a chlorine facility at the Central District Wastewater Treatment Plant. This facility will be elevated 4.9 m (16 ft) above ground-level to accommodate SLR and storm surges, according to the April 2017 BBC article, "Miami's fight against rising seas." The City of Miami Beach is installing pumps, improving drainage systems, and raising roads as part of their approach to address rising sea levels.

San Francisco, under immediate and long-term threat from SLR, has developed the Sea Level Rise Action Plan, which will have an SLR adaptation plan by 2018. Combined sewer discharge (CSD) outfall structures with low-elevation weirs present immediate threats from SLR to the wastewater treatment process. In 2014, a device to prevent the inflow of seawater into the sewer system was installed in a CSD outfall structure. Data gathered from this installation will provide information useful for the installation of future devices.

New Orleans faces risks from SLR from loss of coastal land. As noted in the report, *Resilient New Orleans: Strategic actions to shape our future city*, Greater New Orleans has invested \$14.5 billion in such infrastructure as pump stations, levees, and floodwalls. The City of New Orleans also will leverage financial resources available



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through several sources to support the Coastal Protection and Restoration Authority. Adaptation approaches may, in many cases, require additional resources.

Resources available to utilities

Localities can access many resources to help develop climate change adaptation strategies. WEF offers the book, *Emergency Planning, Response, and Recovery* as well as the upcoming manual, *Sustainability and Energy Management for Water Resource Recovery Facilities*. EPA's Creating Resilient Water Utilities (CRWU) initiative also can be a resource. Through CRWU utilities can access tools, training, and assistance. The Climate Resilience Evaluation and Awareness Tool (CREAT) provides climate change threat identification, consequence assessment, and adaptation evaluation options for water and wastewater utilities. The table above shows threats listed in CREAT for use in preparing assessments in the tool. These resources can be found at www.epa.gov/crwu.

CRWU also offers a basic guide to the effect of climate change on water and wastewater utilities. This guide is titled *Adaptation Strategies Guide for Water Utilities*.

For European cities, the European Union's Climate-Adapt program can be found at <http://climate-adapt.eea.europa.eu>. It provides information on several areas, including projected climate change, adaptation case studies, options, and planning tools. It also enables users to share data.

For resources spanning both U.S. and international interests, resources from 100 Resilient Cities can be found at www.100resilientcities.org. Formed and funded by the Rockefeller Foundation,

Threats listed by the Climate Resilience Evaluation and Awareness Tool

Threat group	Threats
Altered service demand and competing use	Changes in agricultural practices & outdoor use Changes in energy sector water needs Changes in influent flow & temperature Changes in residential use
Altered or loss of ecosystem services	Altered vegetation / wildfire risk Loss of coastal landforms Loss of wetlands
Degraded water quality	Altered surface water quality Saline intrusion into aquifers
Increased flood frequency & extent	Coastal storm surges High flow events
Increased incidence of droughts	Lower lake and reservoir levels Reduced groundwater recharge Reduced snowpack

100 Resilient Cities provides "resources necessary to develop a roadmap to resilience."

Action today pays off in the long run


The work needed to adapt to climate change and handle extreme weather events can be expensive; however, the do-nothing option can be even costlier.

For example, New York City has an estimated \$1.1 billion of vital infrastructure at risk. To mitigate the risk, New York is investing in protective measures for facilities and structures and is developing the city's green infrastructure. Construction investments between \$315 million and \$426 million in the city can save potentially more than \$2 billion in cumulative emergency response costs by 2065 according to Workshop W13: Vulnerability & Risk Response to Climate Change from WEFTEC® 2015.

Two principal goals for water and wastewater utilities regarding climate change effects are

- to assess risk and uncertainty due to climate change and
- to develop and take actions to improve resilience and sustainability in utility facilities and overall utility management.

Federal, state, and local funding is needed to adapt infrastructure and water supplies to climate change. As part of an ongoing effort to encourage funding for critical water infrastructure, WEF's government affairs team developed talking points on climate change related infrastructure investment. Access these talking points at <http://bit.ly/climate-talking-points>.

Beth Conway is an engineer in the Water Science & Engineering Center and **Amy Kathman** is a Government Affairs specialist at the Water Environment Federation (Alexandria, Va.). 



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Amy Kathman

Creating the space to innovate

A policy perspective

In August 2017, a 2-day experts' workshop, titled *Creating the Space to Innovate*, culminated a year's worth of progress in advancing innovation. Leadership, culture, procurement practices, regulatory programs and policies, and permit conditions all contribute to putting innovation into practice as much as does the development of new technologies. The Water Environment Federation (WEF; Alexandria, Va.) hosted

the workshop in its role as a supporter of the Leader's Innovation Forum for Technology (LIFT) program.

LIFT is a joint effort of WEF and the Water Environment & Reuse Foundation (WE&RF; Alexandria, Va.). The program seeks opportunities to promote the adoption of innovative technologies and practices. LIFT includes a focus on the people and policies of innovation

to identify and implement measures to manage or share risk. One example of this is LIFT's goal to provide a "space" for innovation through permit flexibility in compliance schedules or different kinds of permits.

Building on previous work

Previous efforts have laid the groundwork for the *Creating the Space* workshop. For example, prior workshop participants developed specific implementation scenarios around technologies most likely to be affected by barriers, flexibility needs, and regulatory incentives. Developing the scenarios relied, in part, on interviewing key innovators and early adopters who have pursued groundbreaking approaches and technologies to solve water issues. These interviews sought to gain an initial understanding of the requirements, motivators, accelerators, and challenges to these initiatives. For each scenario a strengths, weaknesses, opportunities, and threats (SWOT) analysis helped to refine



“LIFT includes a focus on the people and policies of innovation to identify and implement measures to manage or share risk.”



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further the articulation of constraints and opportunities for each scenario.

At the Creating the Space workshop in August, experts identified options – at a very specific and detailed level –, to eliminate constraints and take advantage of opportunities. The participants of the workshop considered ways in which its regulatory activities can reduce barriers to, or encourage incentives for, technology and innovation. The experts focused on high-interest technology implementation scenarios, their regulatory barriers, and where there is space to streamline between technology implementation and the regulatory/policy framework.

The workshop focused on five technology areas. These themes are high-priority areas for implementation and have encountered policy and people challenges to the uptake of the innovation. The first theme, Improved Risk Sharing and Institutional Barriers, related to general business practices while the other four were related to specific technologies or management practices. They include:

- Digestion Enhancements,

- Water Capture and Reuse for Potable Uses (indirect and direct potable reuse and unplanned use all were included in discussion, but direct potable reuse was the focus),
- Reclaimed Nutrients, and
- Nutrient Optimization Strategy.

The experts concluded that while progress is being made to promote innovation in this sector, an overall challenging context for innovation remains. This situation signals a need to step back and discuss the ingredients of both a near-term and longer-term strategy to create an “innovation safe space” for the sector, as well as an “innovation culture” in the longer term.

Addressing policy and regulation

Policy and regulation also can substantially control how and when innovative technologies and practices are adopted. The primary federal regulations have not changed materially in more than 20 years. To enable innovation, the water sector must explore the landscape at the implementing mechanism level and devise specific approach(es) that will

- fully meet legal and regulatory requirements,
- provide certainty and defensibility for the operator, and
- reasonable assurance for regulatory bodies that compliance can be discerned, verified, and enforced if not met.

Examining the broader regulatory context to explore such areas as state-to-state reciprocity, technology acceptance, and technology procurement can help ensure the sector is prepared to embrace new technologies efficiently and without undue uncertainty or delay.

Finally, the experts also provided input into the policy components that form the basis of the WEF Government Affairs Committee’s action plan. For more information on Creating the Space to Innovate, the action plans, WEF public policy efforts, or learn how you can get involved, visit www.wef.org/advocacy/legislative-and-regulatory-affairs.

Amy Kathman is a Government Affairs specialist at the Water Environment Federation (Alexandria, Va.). [DM](#)



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Fidan Karimova

UNLEASHing the Sustainable Development Goals

Eight WEF young professionals explore global issues

This year, an inaugural event, called UNLEASH (www.unleash.org), brought together more than 1000 talents from around the world to tackle the United Nation's Sustainable Development Goals. The Water Environment Federation (WEF; Alexandria, Va.) sponsored eight young water professionals to attend the in Denmark to represent the North American water sector.

After several days of a facilitated innovation process, conceiving solutions, and testing them with leading experts and companies, one the WEF-sponsored professionals, Fidan Karimova, was selected to receive the Most Visionary award. Ashton Kutcher presented this award in front of thousands of attendees, which included the Princess of Denmark.

The Sustainable Development Goals

The Sustainable Development Goals (SDGs) originated in 2016 to continue the work of the United Nation's Millennium Development Goals MDGs that originated in 2000 with 189 countries signing on to seek their achievement by 2015. Between the two lists, the number of goals increased from eight to seventeen, adding areas that were not previously covered. The SDGs is the largest global partnership agreement and development plan for the planet ever made, according to the UNLEASH website. SDG 6 seek to "ensure availability and sustainable management of water and sanitation for all."

WEF's role and contributions

Although North American countries are not automatically associated with vulnerable water sources, the Flint, Mich., water crisis in the U.S. and radioactive particles in northwestern Ontario in Canada prove that no region is immune to water issues. The Water Environment Foundation (WEF) was established exactly for this reason – to protect public health and the environment through increasing the awareness of the



affect and value of water. WEF supports young professionals in the water industry and encourages them to take on more proactive roles in the industry.

Once in Denmark, the eight WEF-sponsored participants mixed with the other 1000 participants and were placed in groups with people from throughout the world. For example, Karimova's team consisted of four men from Mexico, Denmark, Canada, Brazil. They named their team OTWOH, which is a play on words – H2O reversed into O2H/OTWOH. It stands for Ocean Plastics to Heat.

This team, led by Karimova, proposed an alternate source of energy at water resource recovery facilities. The proposal calls for harvesting pollutant plastics from the ocean and using them as a fuel source via the process of gasification. The idea originated generated with Karimova's organization, Global Water Girls (www.globalwatergirls.com), and the UNLEASH group developed it further.

The group is continuing to work on the project after the UNLEASH event and hopes the solution will eventually help disrupt the waste and energy industries.

Why seek the SGDs?

Water and sanitation are key to thriving communities in promoting the growth of future healthy generations and access to a cleaner environment. This goal gains even more importance when taking into consideration that 1.8 billion people globally use a source of drinking water that is fecally contaminated and 2.4 billion people lack access to basic sanitation services, such as toilets or latrines, according to the UN. However, since 1990, 2.6 billion people have gained access to improved drinking water sources; so progress has been made and needs to continue.

To quote Leonardo Da Vinci, "water is the driver of nature." Once we learn to better take care of our water systems, we will be able to meet many of the other SDG goals. The UNLEASH event helped highlight, once again, that SDG6 is at the core of all the other issues. If addressed, it could help simultaneously meet many other SDGs.

Fidan Karimova is water technology collaboration manager at the Water Environment & Reuse Foundation (Alexandria, Va.) [@wef](#)



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WEFTEC Innovation Pavilion draws global talent

- Line-up of 14 innovative companies from around the world
- Advanced treatment and sensor technologies feature
- BlueTech hosts breakfast briefing and presents on industrial treatment

The Innovation Pavilion at WEFTEC, which takes place in Chicago from September 30 to October 4, boasts a truly international line-up for 2017. Companies from New Zealand, Denmark, Finland and Turkey are among those sharing some of the most promising technologies in the water industry.

Technology market intelligence specialist BlueTech Research has selected seven of the companies participating in the 6th Innovation Pavilion. The US Water Environment Federation (WEF) has partnered BlueTech and Imagine H2O to create a unique programme of events for entrepreneurs, investors, regulators, business leaders, scientists and engineers in the utility and industrial sectors.

Fantastic opportunity

Paul O'Callaghan, chief executive of BlueTech Research said, "The Innovation Pavilion is a fantastic opportunity to find out more about some of the most exciting innovation globally. BlueTech's expert analysts have identified enhanced separation technologies, sustainable water and wastewater treatment processes and some of the most advanced sensor technologies in the world.

"Innovation is crucial to delivering the water and wastewater services needed by growing populations in a water constrained world. As well as hosting cutting-edge technologies, the Innovation Pavilion also serves as a platform for discussions around their implementation."

Innovative companies

The Pavilion features 14 early and growth stage companies selected by BlueTech Research, Imagine H2O and the WEF Innovative Technology Awards. The BlueTech Innovation Pavilion companies are:

- **Aquafortus**, from New Zealand, which has invented an osmotic process that can be used for driving a forward osmosis process.

“Companies from New Zealand, Denmark, Finland and Turkey are among those sharing some of the most promising technologies in the water industry.”

- **Genifuel**, headquartered in Utah, USA, which has a hydrothermal system which achieves very fast conversion of the organic content of wet biomass.
- **Hyrec**, a Turkish company, which has a membrane separation technology that can concentrate solutions to very high levels without using high pressure or heat.
- **Nanonord** from Denmark which has developed the world's first nuclear magnetic resonance (NMR) online sensor for measuring nitrate, nitrite, ammonium, and other substances, in sewage sludge.
- **RealTech** based in Canada, which has developed an optical sensor platform which addresses the challenges of volatile light sources in spectrometry.
- **Sofi Filtration**, a Finnish company with a self-cleaning microfiltration technology.
- **St Cloud Mining** from New Mexico, USA, which has developed a zeolite water treatment media with high selectivity for ammonia.

There will be daily tours of the Pavilion and nightly drinks receptions where visitors can meet and network with the Pavilion companies.

Research outputs

The Pavilion will host a session with Paul O'Callaghan, sharing learnings from research carried out by BlueTech's expert analysts. Two of the most recent reports are on technologies for making plastic from wastewater and the surge in the ballast water treatment market.

A Breakfast Briefing on Tuesday, October 3 will feature a presentation from BlueTech Technology Assessment Group (TAG) expert Jim Hotchkies on trends in industrial water. The event is sponsored by True North Venture Partners and places are limited.

Steve Gluck, a member of BlueTech TAG, is also participating in the panel *No Water, No Energy, No Food: Managing the Nexus*, which takes place on Monday, October 2 at 10:30 am in Room N426b. Participating companies and organisations include Coca Cola, Shell, Southwestern Energy, The Water Council and GE.

WEFTEC is North America's largest water expo and is attended by over 20,000 of the world's leading water experts. For more information, please visit www.weftec.org.

About BlueTech Research

BlueTech® Research provides investors, water companies, researchers and regulators with the latest information at their fingertips. The company provides clarity and critical analysis on emerging water technology market areas.

BlueTech Research maps and analyses the water technology innovation landscape. The company is focused on what is changing and how new approaches, new technologies and new needs are reshaping the water technology market. 

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WATER ENVIRONMENT ASSOCIATION OF UTAH General Association Awards 2017 Nomination Form

Instructions: Place a "X" mark in the box next to the award for the nomination. Next, fill out the information for the nominee and yourself (nominator) as fully as you can, this information will be used by the selection committee to process the nomination. Please send a separate application for each nomination, **OK to copy form if needed for this purpose**. Next, FAX application to: **(801) 536-4301, no cover necessary**, e-mail to: **dgriffin@utah.gov**, or mail to: **Division of Water Quality (attention Dan Griffin) PO Box 144870, Salt Lake City, Utah 84114-4870**. Applications are due by December 29, 2017.

WEAU is a member organization where members can nominate those individuals or organizations within our industry that deserve recognition by the association for their efforts. When you send in your nomination, you will be contacted to arrange a time for a visit by the awards committee. Individual awards must be nominated by someone other than nominee. If nominating an individual, please notify their supervisor and have them sign the form. Members with significant managerial responsibilities, (i.e., general managers, etc.) are ineligible. Those with significant supervisory responsibilities, (i.e., coordinators, directors, etc.) should be considered for the supervisor award, or program award. If you have any questions, please feel free to contact Dan Griffin at (801) 536-4387. Good Luck.

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 84114-4870
By Dec. 29, 2017

A Bear of a Quiz!

By Paul Krauth, P.E.

1. **The test most often used to determine potential oxygen demand due to nitrogen is**
 A. TIN C. TKN
 B. TN D. TAN
2. **Ammonia toxicity increases with**
 A. Increasing pH
 B. Decreasing pH
 C. Increasing DO
 D. Decreasing DO
3. **Which of the following is hardest to treat?**
 A. NH₃ C. ON
 B. NO₂ D. DON
4. **When ammonia combines with chlorine what is the ultimate reaction form?**
 A. NH₃ C. NHCl₂
 B. NH₂Cl D. NCl₃
5. **The optimum pH for nitrifying bacteria is?**
 A. 6.5 C. 7.5
 B. 7.0 D. 8.0
6. **Nitrification reduces the alkalinity approximately how many mg per mg NH₃ converted in?**
 A. 2.65 C. 7.14
 B. 4.57 D. 10.24
7. **Nitrifying bacteria become oxygen limited (< 50% of maximum rate) at a DO of?**
 A. 0.1 C. 1.0
 B. 0.4 D. 2.0
8. **The operating parameter best used to control nitrification is?**
 A. MLSS C. SRT
 B. MLVSS D. oSRT
9. **For full denitrification a ratio of BOD to N should be at least?**
 A. 4 C. 8
 B. 6 D. 10
10. **The carbon source that provides maximum denitrification rate is**
 A. Endogenous
 B. Influent
 C. Supernate
 D. Methanol

ANSWERS:
 1. C 2. A 3. D 4. D 5. D
 6. D 7. B 8. D 9. A 10. D

Students and Young Professionals

Young Professionals Mid-Year Conference Social

By Andrew Hobson and Marianka Sochanska

The WEAU Young Professionals (YPs) held their annual evening social in conjunction with WEAU’s Mid-Year Conference. The purpose of the social was to provide an opportunity for those YPs attending the conference to network and discuss the conference highlights. This year’s dinner was held at Red Robin Gourmet Burgers in West Valley City. The social was a great success, with about 20 people attending. The group included several engineers, recent hires, students, vendor representatives, and WEAU leadership including Chris Reilley, Clint Rogers, and Jeff Beckman. The fun and friendly atmosphere helped attendees form new relationships and strengthen existing ties. A big thank you to the Young Professionals Committee for organizing this wonderful event and to all those who attended. We look forward to seeing everyone again at the YP breakfast at the Annual Conference! 





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Tracking Chemical Use to Optimize Quality and Save Money

Q&A WITH OPWORKS™ USER AND DEVELOPERS

What technology is available to monitor and optimize my plant operations?

The Wastewater Treatment Facility in Havre, Montana is successfully tracking chemical dosing, equipment maintenance, operators' shift notes, and supervisory control and data acquisition (SCADA) information with OpWorks™. OpWorks™ is a customizable, cloud-based solution for facility operators, superintendents, and managers that saves data in one easy to access location. "Our OpWorks™ account is set up to allow us to view any facility information that we are tracking. We can access all past reports for whatever date ranges we choose. We can cross reference operational changes posted to the shift notes section to see what works best to produce a quality effluent, and also what changes to avoid," says Bryan Frey, Havre Wastewater Operator.

How does OpWorks™ help operators track chemical use?

"OpWorks™ can be set up to log information through the use of online worksheets and work orders. Worksheets allow operators to manually enter sample data and readings and can be customized to replicate how a water system already records this data manually. The worksheets can also be automatically populated through a SCADA connection. Work orders can be generated based on a variety of chemical measurements," says Jarrod Vink, OpWorks™ Lead Developer.

What types of plants can benefit most from the use of OpWorks™ to track chemical use?

"OpWorks™ can be used by any facility that needs to report, purchase, or analyze its chemical use. These include, but are not



limited to, traditional lime softening water treatment, membrane water treatment, wastewater treatment, and any industrial plants that use water," says Vink.

How does OpWorks™ improve the monitoring of chemical use in plants?

"Over or under dosing a chemical can lead to increased chemical costs and can have an adverse effect on water quality. OpWorks™ allows systems to analyze chemical usage against flow rates, dosage setpoints, and lab measurements to ensure optimal chemical dosing. OpWorks™ gets rid of the paper logs that fill filing cabinets and drawers throughout systems and makes that information electronic. This information can be searched, accessed instantly via a computer or mobile device," says Vink.

How can OpWorks simplify asset management and maintenance?

Unique QR Codes can be created for each asset, which can be printed out on a standard printer. The QR codes are affixed to each piece of equipment that is being monitored in OpWorks™. "In addition to the ability to search in OpWorks™ for a specific asset, an operator can simply scan the QR code with a mobile phone or tablet, and all of the data relevant to that asset will immediately appear at their fingertips. It simplifies data access and also reduces the potential for inputting information to the wrong asset," says Jason Sanden, OpWorks™ Technology Division Manager. There is also an OpWorks™ app available for Apple and Android users. Contact OpWorks Sales Support for more information at info@opworks.us.



Pipeline Inspection Services, Inc.

was established in Nampa Idaho in 2003 as an Idaho licensed public works contractor specializing in cleaning and inspection of sewer systems. In 2005 we began our expansion into the trenchless rehabilitation market with our spray applied coating SprayWall manufactured by SprayRoq and have coated hundreds of sewer manholes and sewer lift stations both old and new. SprayWall allows us to apply a corrosion coating on a new or existing structure or up to 1250 mils in a single application for full structural support. Over the last 14 years Pipeline has become a leader in the trenchless sewer rehabilitation market with its ability to do Manhole rehabilitation, Cured in Place Pipe Lining, Cured in Place Spot Repairs, as well as major Infiltration repairs. Along with our trenchless work, we also provide sewer lagoon dredging and dewatering also. We have rehabilitated regional sewer lift stations over 45 feet deep and 12 feet in diameter and installed CIPP liners from 4" pipes to 36" pipes. In 2015 with a growing demand for our services in the state of Utah we began our expansion efforts. In the summer of 2016 we started construction on our new shop and office facility in West Jordan, Utah and officially opened our doors for this location in November of 2016. We have an ongoing effort to be a leader in the wastewater industry and



“ We have an ongoing effort to be a leader in the wastewater industry and lend out our expertise on large or small rehabilitation projects for cities, sewer districts, engineers, excavation contractors, and anyone who is looking at trenchless rehabilitation options.”

lend out our expertise on large or small rehabilitation projects for cities, sewer districts, engineers, excavation contractors, and anyone who is looking at trenchless rehabilitation options.

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