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DIGESTED news

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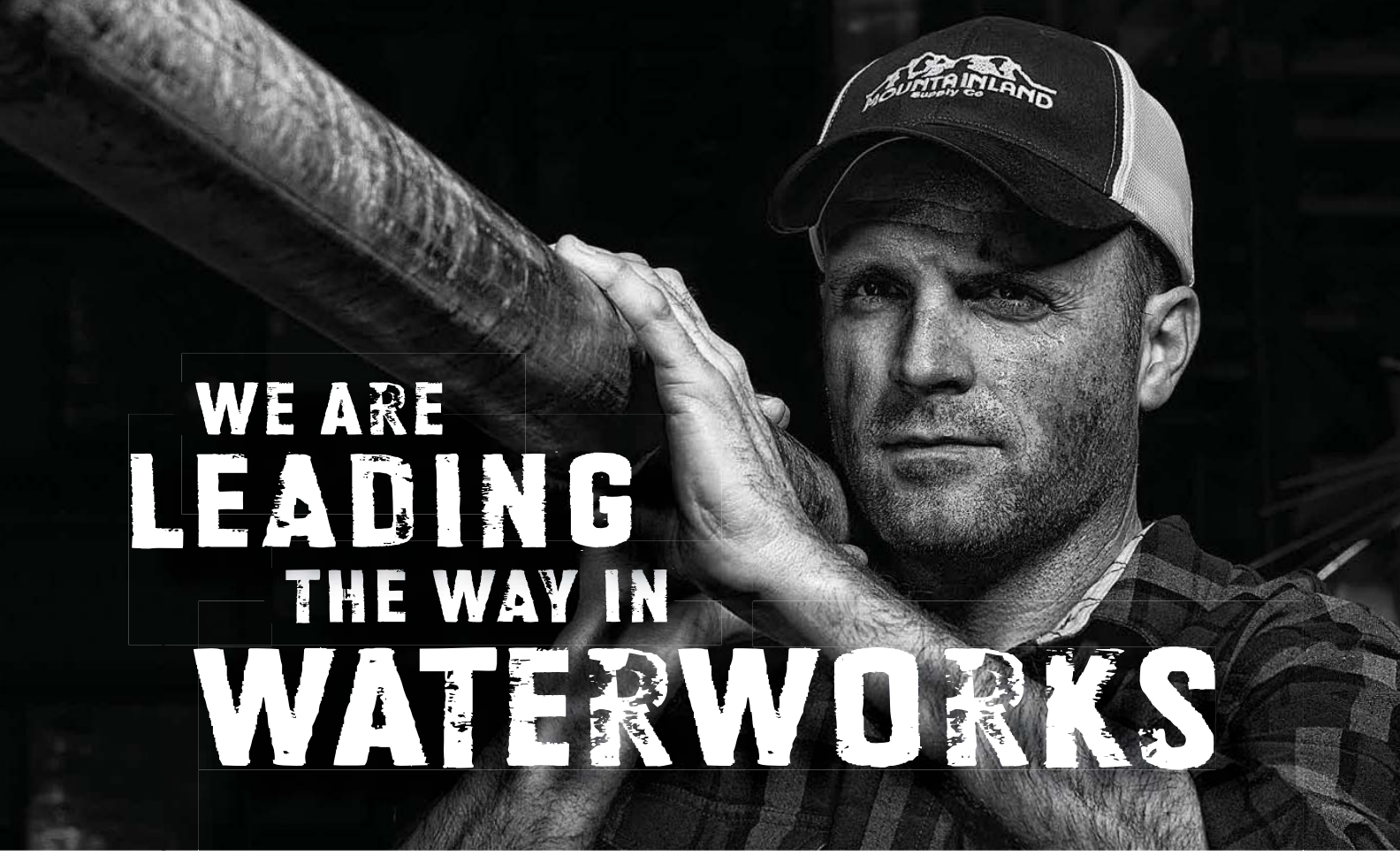

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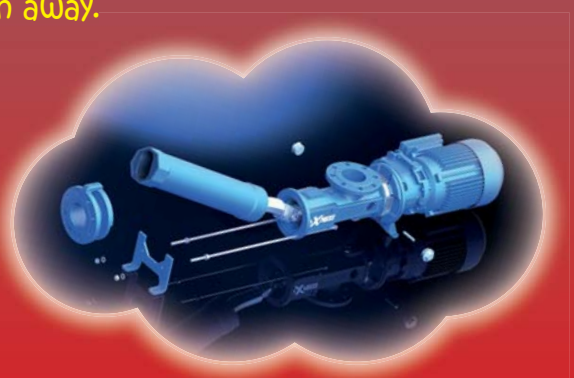
Santa, the WANGEN Xpress pump is sooo cool.
I just know my boss will be blown away.

Santa, You're the best, Dude.

Love, Bobby



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FEATURES

Departments

Selfless service

Matt Myers

Okay so maybe it's because I am scrambling to come up with a President's message for this Winter issue of the *Digested News* on the week of Thanksgiving, or maybe it's because I am just so dad-gum sentimental these days, but I thought that I'd try for something here that is a little more in tune with the holiday season.

Whatever your religious persuasion, one thing that as Americans we espouse during this time of year is a tendency to turn to those less fortunate than ourselves and do kind things for them. We spend more time with family, we focus more on the people that are most important to us, we give gifts to each other. There seems to be a general inclination toward positive feelings. Is it any wonder why so many people look forward to the holidays?

There is a concept in the Psychology world called "Negativity Bias" also sometimes called "Negativity Effect." Basically it is the *"notion that, even when of equal intensity, things of a more negative nature (e.g. unpleasant thoughts, emotions, or social interactions; harmful/traumatic events) have a greater effect on one's psychological state and processes than do neutral or positive things.[2][3][4] In other words, something very positive will generally have less of an impact on a person's behavior and cognition than something equally emotional but negative."* (I copied the quoted text straight out of Wikipedia, so you know that its true!)

> "Thanks for all you do in WEAU and let's keep making things better!

Negativity Bias is why you remember gossip about a person more than the complements they receive. It is why you remember where you were and what you were doing when you heard about 9/11 or that JFK was assassinated. The prevailing theory is that Negativity Bias is a survival mechanism. Like after burning your hand on the stove, you remember not to do it again. You remember where the dangers are in order to avoid them. Physical, emotional, and psychological dangers alike.

Now what does Negativity Bias have to do with the Holiday season? Absolutely Nothing! Except for this tidbit: In order to overcome Negativity Bias in your interactions with others, some psychologists recommend a 5:1 (or better 10:1) ratio of positive comments to constructive criticisms. This applies to managing people, raising kids and being married! Also, it applies to the holiday season when positivity abounds, and we are really going to need some positivity after this recent election cycle!

In my first President's message (Summer 2016 Issue) I admonished us all to support each other. Let me echo that comment and admonish us all again to focus on building each other up instead of tearing each other down. I don't think we really have a problem with that in our association, but we can always try to do better. Thanks for all you do in WEAU and let's keep making things better! DN

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Time to be thankful

Chad Burrell

As the year comes to a close and we prepare to begin another it is a great time to reflect and recommit. With celebrating Thanksgiving and Christmas right after each other I would hope that regardless of our religious or political leaning we can take count of the things we are grateful for, the blessings we have, and the time we are living in. I know one thing we often take for granted is the clean water we have to drink and the fact that when we flush, it goes away! Thanks to the industry we work it both of these are readily available to everyone in our communities. I hope this is something we can all take pride it and be thankful for. Enjoy and Happy Holidays!!

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Fall Training review

Article by Brett Nelson, quiz by Jared O'Brien

Fall is definitely in the air…. So on November 3, 2016 we held our fall pretreatment training at South Valley Sewer. We had some great speakers with some great topics. First up was Steve McDonald with Carollo Engineers, he gave some great insight on the water and wastewater issues in some of our surrounding states such as reuse and how close we are to being (toilet to tap). New Orleans, he stated, is typically recycled 17 times. Jennifer from DEQ then gave us some valuable insight on some typical annual report findings such as updating our lists of IU's, attachment for SNC publication not neccicary if you attach the website to the paper published in date etc. Sarge Williams from Frontier Scientific gave a great presentation On TTO from an industry standpoint. Jeff Macfarlane and Brad Jones also gave great insight that I feel we all needed on an Industrial Waste Survey. It is always hard to get the information from the cities on new businesses moving in. To finish up we were privileged to here from the State a bit on Pollutants Not Present, always a great topic. The next training will be in February sometime I believe put on by the DEQ folks. Thanks for everyone's help. DN

1. **Which of the following affects the UV system efficiency?**
   a. Turbidity
   b. Detention Time
   c. Water Temperature
   d. PH

2. **What parameters are needed to determine organic loading?**
   a. Flow, MlSS
   b. Flow, BOD
   c. BOD, COD
   d. Flow, COD

3. **Fine particle solids that will not settle from wastewater are known as _____.**
   a. Volatile Solids
   b. Suspended Solids
   c. Dissolved Solids
   d. Colloidal Solids

4. **How many pounds of polymer must be added to 30 gallons of water to make a 0.1% polymer solution?**
   a. 1.60 lbs
   b. 0.25 lbs
   c. 0.50 lbs
   d. 1.0 lbs

5. **Which treatment unit is not dependent on bacteria for efficiency?**
   a. Aeration Basins
   b. Oxidation Ditches
   c. Polishing Ponds
   d. Primary Clarifiers

6. **Phosphorus can be found in wastewater as _____.**
   a. Orthophosphate
   b. Polyphosphate
   c. Organic Phosphorus
   d. All of the above

7. **A 250 foot long pipe 12 inches in diameter holds how many gallons when full?**
   a. 196
   b. 1470
   c. 5870
   d. 1640

8. **Grit is washed in order to _____.**
   a. Enhance settleability
   b. Remove organic matter
   c. Remove inorganic matter
   d. Improve filterability

9. **The final product of denitrification is _____.**
   a. Ammonia
   b. Nitrogen Gas
   c. Carbon
   d. Carbon Dioxide

10. **A diaphragm pump is a type of _____.**
    a. Dynamic feed pump
    b. Positive displacement pump
    c. Rotary pump
    d. Centrifugal pump

ANSWERS:

1)A 2)B 3)D 4)B 5)D
6)D 7)B 8)B 9)B 10)B

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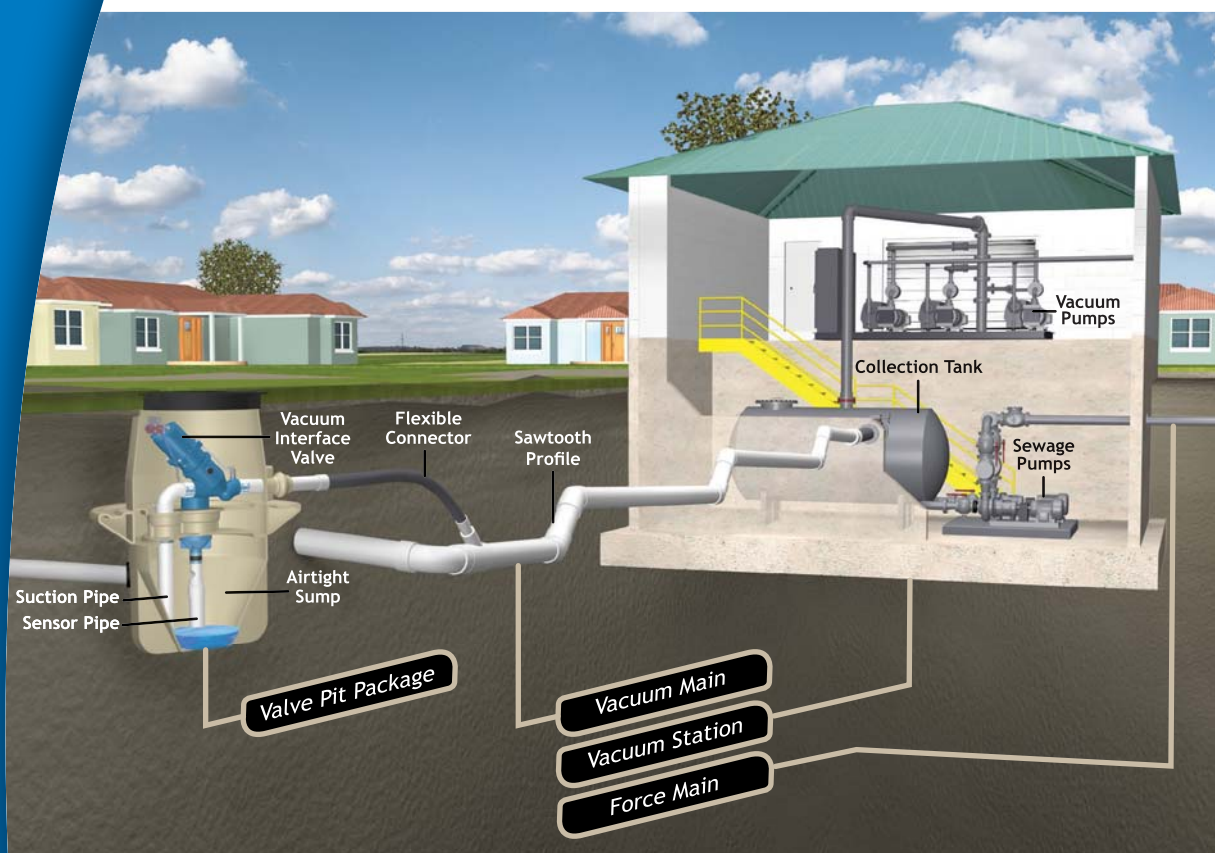

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Utah teams have great showing at WEFTEC

By Jared O'Brien

For those of you who were not able to attend Weftec this year in New Orleans, I am proud to announce that our Utah ops challenge teams done very well representing Utah. Both teams were competing in division two this year. This division can be tough due to the amount of teams that compete in this division. This year there were 32 teams in division two with 10 teams in division one. Below are the scores and rankings for both teams.

North Davis Royal Flush

- Lab Event: 70.34 points; Ranked: 12th
- Safety Event: 342.6 points; Ranked: 2nd
- Process Event: 58.89 points; Ranked: 16th
- Maintenance Event: 82.84 points; Ranked: 8th
- Collections Event: 91.32 points; Ranked: 3rd
- **Overall:** 394.08 points; Ranked: 4th

Wasatch All-Stars

- Lab Event: 75.66 points; Ranked: 9th
- Safety Event: 100.0 points; Ranked: 1st
- Process Event: 64.89 points; Ranked: 13th
- Maintenance Event: 91.61 points; Ranked: 3rd
- Collections Event: 76.74 points; Ranked: 9th
- **Overall:** 408.9 points; Ranked: 2nd

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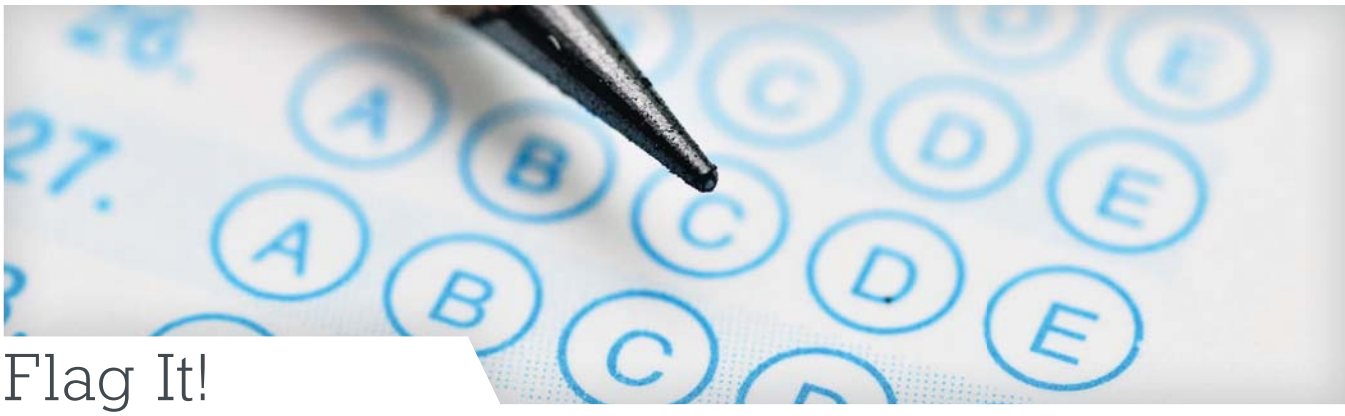
Spotlight on Clint Giles

By Rob Jaterka

Clint has been apart of the Magna Water District for the last 18 years. The collections crew is where he spends his 40 hours a week. Grade 4 in collections and a grade 4 in water distribution are the certification's he holds. Raised in Magna Clint and his wife Jennifer now reside in West Jordan. Clint is often talking about his three children or his three grandchildren. Being a very family oriented man he enjoys time spent fishing, hunting and riding atv's around his in laws cabin in Tabiona Utah.

Clint has been a participant of Magna's operators challenge team every year since they started competing five years ago. A man you can count on to be there to give a hand when needed. It has been my pleasure to work side by side with him for the last 12 years.pn



Flag It!

By Lonn Rasmussen

1. **Where can you go to look up information on traffic control set up?**
   a. SPICA
   b. SACST
   c. MUTCD
   d. MCTAD

2. **UDOT requires all flaggers to?**
   a. Carry their flagger card
   b. Wear florescent green vests & hard hat
   c. Wear a class 1 vest
   d. Wear steel toe shoes

3. **Which is *NOT* a flagger qualification?**
   a. Intelligent
   b. Mentally alert
   c. Neat appearance
   d. Be able to run away from danger

4. **Which is *NOT* required clothing for a flagger?**
   a. Full length pants
   b. Florescent green vests & hard hat
   c. Safety boots
   d. Safety glasses

5. **What size must your stop slow paddle be?**
   a. 12" X 12"
   b. 18" X 18"
   c. 24" X 24"
   d. 36" X 36"

6. **What shape must the stop slow sign be in?**
   a. Octagon
   b. Square
   c. Round
   d. Pentagon

7. **The flaggers personal vehicle can be no closer than?**
   a. 75'
   b. 100'
   c. 125'
   d. 150'

8. **In which hand shall the flagger hold the stop slow paddle?**
   a. Either one
   b. Depends on which way traffic is headed
   c. Left
   d. Right

9. **What can be used in place of the stop slow paddle in an emergency situation?**
   a. Your arms and hands
   b. An orange vest
   c. A flashlight
   d. A red flag

10. **How long can the emergency device be used to control traffic?**
    a. As long as it takes
    b. Until the stop slow paddle arrives
    c. Until the police come
    d. Until relieved by another flagger

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

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Certifications and Permits

By Curt Simmons, WEAU Safety Committee

In the safety world we are always talking about certifications, and permits. You have to have a certification to work with chemicals, a permit to enter a confined space, fit testing to wear a respirator, certification to drive a forklift, a physical fitness card for the Utah Department of Transportation as well as many driving certifications, CDL – Class A, Class B, etc. You, also, have to certify to operate a wastewater treatment plant, collection system, or laboratory. At our facilities, we put our staff through classes and training in hopes of keeping them competent to operate machinery, recognize hazardous substances, or know how to safely wear a respirator and know what its limits are, etc. So many things today require training and proof of that training through certification. Certifications prove that you have attended a class and have shown competency to perform tasks. Permits are designed to make sure you have checked for all of the hazards before you get started… before it is too late. Permits are the check sheet to assure that all the certified folks follow all the rules.

> "In today's society you must be able to prove competency in almost everything that you do.

In today's society you must be able to prove competency in almost everything that you do. Keeping compliant and current on all these certifications can be daunting… but think of a world of professionals without permits and certifications. Everything would be affected by this chaos. There would be no driver's licenses – folks could get in a car without knowledge of traffic or driving skills and just drive. There would be no training or certification to be a policeman – they could run around with guns handing out law and order and interpreting the rules all on their own. Anyone could practice medicine – "doctors" would not be certified or licensed professionals – removing the wrong kidney would be part of the lifesaving experience. Imagine yourself sitting in the doctor's office… you have just been diagnosed with a major disease, the doctor wants to do emergency surgery in order to stop the disease from spreading and then comments to you, "I just wish I knew more about the internal organs." Imagine an un-certified contractor building a bridge – thousands of people must cross every day, there would be no rules requiring proof of his knowledge to know how much weight it must hold, the material it would be constructed of, etc. the results could be catastrophic! These examples are just a small fraction of the certifications that people all over the world must have to prove they are competent to do their job. This all sounds extreme, but the idea is the same no matter how major or minor the certifications are. They are put in place to make sure you do not hurt yourself or others by not knowing what you are doing.

It is human nature to not want to be told what to do or have to prove something to someone else. The certification programs are not designed to question your ability to operate equipment; they just prove to the world that you can. So the next time any of us complain about going to a boring class, or taking another test, or filling out another permit, remember the alternative. DN

Toolbox Safety Talk: Be Successful

According to a book called *How Successful People Think*, written by John Maxwell. A common trait among successful people is that they think and give of themselves unselfishly. John describes how to practice unselfish thinking…

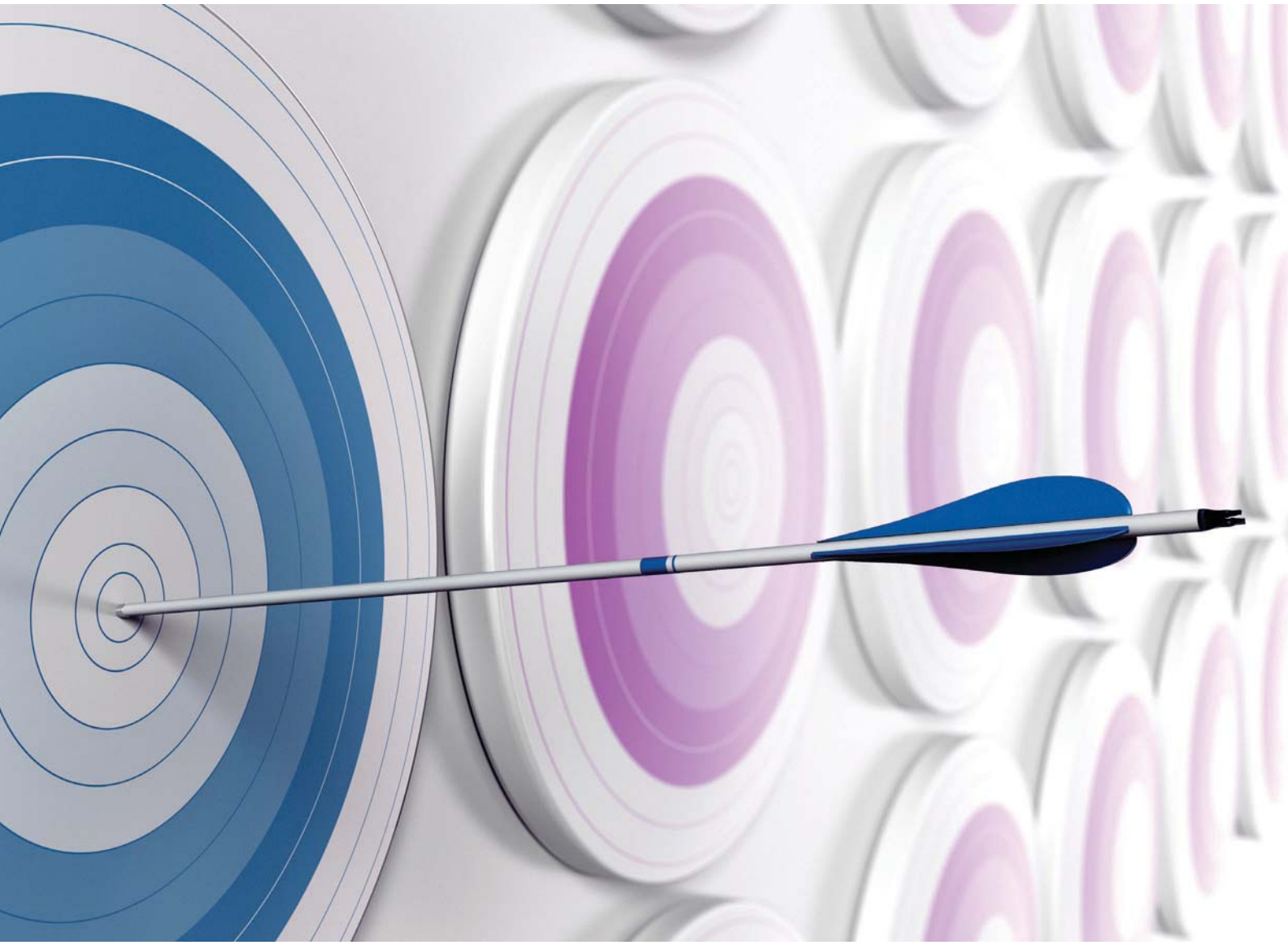
- Put others first.
- Expose yourself to situations where people have needs.
- Give quietly or anonymously.
- Invest in people intentionally.

When you practice unselfish thinking, you increase the quality of your life and the lives of others around you. To relate this to safety means that there is no room for selfish thinking, we all must help each other. Not only should you follow good safety procedures but you should help others to remember the same. One simple act of selflessness could keep someone from getting hurt or even killed.

When it comes to safety it is everybody's job, it is everyone's responsibility. Any reasonable person would go out of their way to avoid injury. That same person should feel the same way about helping others avoid injury as well.

Please take some time to look around you while you work. Learn to recognize hazards as they appear, this is the art of hazard avoidance. Whatever you do never ignore a hazard that may affect you or your safety and never take shortcuts. Then take a moment and think of the next person that may come in contact with this same hazard – repair it, replace it, or report it! If we take just a little more time looking out for each other it will make everyone that much safer. DN

WEAU Safety Committee
Contact us: *csimmons@ndsd.org*



Toolbox Safety Talk: Biological Hazards

Sewage and wastewater contain bacteria, funguses, parasites, and viruses that can cause intestinal, lung, and other infections. If equipment, work practices, and personal protective equipment (PPE) don't protect you from ingesting these agents, you can get sick. During any part of treatment, transport, or application of sewage sludge, you can be exposed to materials that can cause disease. This is true even if you work around treated Biosolids. Careful work habits can help protect you. For work around sewage or wastewater, engineering controls and work practices are the best ways to protect workers from exposures to disease. When engineering controls are not possible, use personal protective equipment (PPE).

What you can do:

- Most important, wash your hands well with clean water and soap before you eat or smoke and after work.
- Do not touch your nose, mouth, eyes, or ears with your hands, unless you have just washed. Most of the time, people get these diseases when they have germs on their hands and they touch their mouth or nose or eyes.
- Keep your fingernails short; use a stiff soapy brush to clean under your nails.
- Wear waterproof gloves when you clean pumps or screens and when you handle wastewater, sludge, or grit.
- Always wear gloves when your hands are chapped or burned or you have a rash or a cut.
- Shower and change out of your work clothes before you leave work.
- Do not keep your soiled work clothes with your other clothes.
- Report any injury or illness you think you got from work right away.
- If you do get sick, be sure to tell your doctor you work in a sewage or wastewater treatment plant. That information will help the doctor know what to look for. DN

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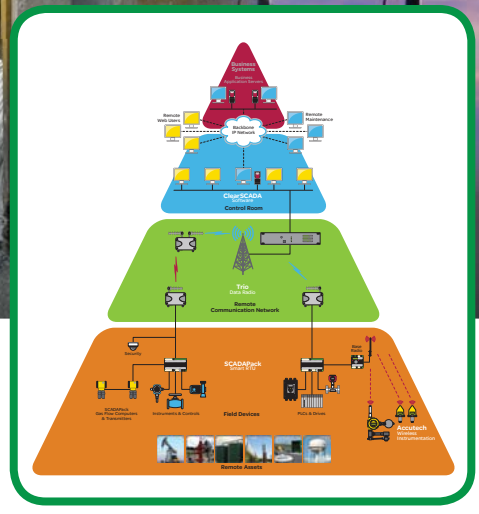

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ANALYZING VIRUSES

By Ken Burgenerer, Lab Director

Recently I attended the Water Environment Federation's Annual Technical Exhibition and Conference (WEFTEC) in New Orleans, LA. This conference highlights many of the problems we are facing around the US and Canada with water and its treatment. No one person or group has all the answers, but we have a lot of problems that need to be addressed. The topic from this conference that I would like to discuss is Viruses.

Viruses have been around since the beginning and have always caused illnesses in plants, animals and humans. This is nothing new. There is however concern that since we do not currently measure viruses environmentally, we may be missing a significant cause of human illness that we have not been measuring.

Wikipedia states "Viruses are a major cause of human waterborne and water-related diseases. Waterborne diseases are caused by water that is contaminated by human and animal urine and feces that contain *pathogenic microorganisms*. A subject can get infected through contact with or consumption of the contaminated water.[1] Viruses affect all living organisms from single cellular plants, bacteria and animal to the highest forms of plants and animals including human beings. Viruses can interact with their host through several methods and mechanisms; some viruses can be host specific (HIV) and some can be less host specific (influenza) viruses. Different viruses can have different routes of transmission; for example, HIV is directly transferred by contaminated body fluids from an infected host into the tissue or bloodstream of a new host while influenza is airborne and transmitted through inhalation of contaminated air containing viral particles by a new host. Enteric viruses primarily infect the intestinal tract through ingestion of food and water contaminated with viruses of fecal origin. Some viruses can be transmitted through all three routes of transmission.

Water virology started about half a century ago when scientists attempted to detect the polio virus in water samples.Since then, other pathogenic viruses that are responsible for gastroenteritis, hepatitis, and many other virus strains have replaced enteroviruses as the main aim for detection in the water environment. From influenza to polio, small pox and HIV, viruses have a major impact on us human beings.

Current thought in the environmental real that a majority of water borne illnesses are caused by viral and not by microbiological elements. Therefore, we need to be analyzing for viruses. This change will probably not come soon, since the best indicator virus has not been chosen and the best methodology is still lurking in the future. However, in order to understand wastewater and its impact on such things, we need more data. DN

1 *http://en.wikipedia.org/wiki/Human_viruses_in_water*

Ken Burgenerer
Lab Director

Advanced Hydraulic Grit Removal Helps Resolve Plant's Combined Sewer Challenges

By Michael Microbi, Technical Writer

Pennsylvania treatment plant upgrades its headworks to innovative grit removal system that handles combined sewer storm surges, removes fine grit particles, and lessens maintenance on operations staff.

The Shamokin Coal Township (Penn.) Joint Sewer Authority's 2015 treatment plant upgrade and expansion, designed by Great Valley Consultants, centered on two primary goals: long term control to mitigate overflows emanating from combined sewers and enhanced biological treatment capability. The project also expanded capacity from 7 MGD to 8.5 MGD average daily flows and peak flow conditions from 9 MGD to 13 MGD.

Adding sequencing batch reactors to the Authority's existing trickling filters allows the plant to achieve nutrient reduction and further lessen its eventual impact on the Chesapeake. In order to deal with the surge events and further protect the new downstream process equipment, the design team from Great Valley Consultants focused on augmenting plant headworks infrastructure.

Incoming grit historically caused problems at the plant. Wet weather surges could overwhelm the older grit scheme, which consisted of an Archimedes screw device that auguered grit from two separate grit chamber wells. The composition of grit entering the collection system during sewer overflow events includes sediment and other forms of very fine grit particles that can be damaging to downstream equipment.

According to the Sewer Authority's General Manager Paul Petrovich, the outmoded grit system was unable to keep up, and it necessitated costly maintenance to clear the accumulated grit four times year. Even though the Sewer Authority could utilize its own Vac trucks, the quarterly clean-outs still took two days and with multiple personnel.

"It was very labor intensive," Petrovich said.

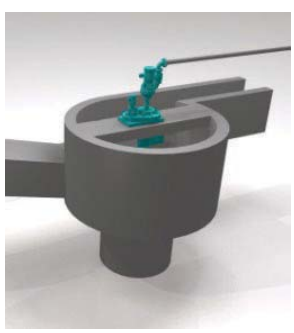
The older system was not equipped to meet the wide variety of grit loads inherent in the combined sewers located in this coal-heavy region, including the finer grit particles that were depositing downstream in the plant. So, the design team undertook a thorough evaluation of various grit removal technologies that would accomplish fine grit removal while maintaining effective performance during the surge events. With funding coming from varied state and federal sources, it made successful grit system selection more complex, and with the historical infiltration, more essential.

Designers visited other treatment plants, and conducted meetings with various operators and also equipment suppliers. The variety of approaches, combined with fine screening being added to the headworks scheme, presented several different potential design scenarios and channel configurations. The designers ultimately specified hydraulic forced vortex technology because of the high grit removal efficiencies that could be achieved with minimal long-term cost.

The specified system was a complete PISTA® 360™ grit removal system with integral hydraulic velocity control technology, grit handling and dewatering components. Unlike conventional

The Sewer Authority's compact PISTA® 360™ Grit Removal System operates in its new headworks building with complete grit pumping and dewatering equipment.

The grit system is removing 99 percent of the plant's incoming grit even during wet weather events.



The PISTA® 360™ integral chamber baffles allow for a 10:1 turndown to maintain ideal grit capture velocities during the plant's storm surges and low flow periods without downstream level control devices.

This underwater image demonstrates how incoming grit efficiently sweeps along the grit chamber's flat-floor for easy removal.

"After start-up, we had to adjust certain settings, but since then we have had basically no other maintenance."

vortex-type systems, the PISTA® 360™ grit removal system with V-Force Baffle™ maintains ideal velocity during low flow and high flow periods, ensuring consistent grit capture. Its inlet flume and integral flow control baffling, positioned within a 360-degree flat-floor grit chamber, comprise the system's patented hydraulic design. The hydraulic action guided by the inlet and chamber geometry cause the incoming grit to be swept along the chamber floor toward the center opening for collection into a lower hopper. There, the grit is fluidized and then pumped for cleaning and dewatering prior to disposal.

The design prerequisites and operating principle differ significantly from sloped vortex or stacked tray type systems, which rely on advance particle sizing and settling rate analysis to achieve proper system sizing and grit capture. Sizing the Sewer Authority's grit removal system simply meant knowing the range of anticipated flows. With that, the hydraulics can be controlled so that the ideal velocity conditions effectively transport and remove 95 percent of grit particles ranging in size from 100 microns to 300 microns.

Additionally, its 10:1 turndown ratio within the chamber means no additional downstream control devices are required to handle peak conditions. When lower or higher flows ensue, the baffle design causes the water level to properly adapt to ensure ideal velocities between 1.6 fps to 3.5 fps.

Petrovich, who joined the Sewer Authority in 2012, has been present from the project groundbreaking to plant commissioning in June 2015. More than a year after start-up, he indicates two major differences between the old grit system and the new PISTA® system: superior grit removal performance and very little maintenance.

"It's removing ninety-nine percent (99%) of the grit, pre-storm and during storm events," Petrovich said. "We don't see any grit downstream, including in the motors, where grit can tear them up."

And that's significant because of the heavy flows encountered during wet weather.

"We are a combined sewer system so during storm events flows can actually reach 13.5 MGD," Petrovich said, adding that the single 12 MGD grit chamber "wasn't missing a beat."

In terms of operation and maintenance, Petrovich said his staff follows the basic maintenance schedule, which primarily consists of periodic lubrication. He reports that the amount of time dedicated to O&M is drastically different than before.

"After start-up, we had to adjust certain settings, but since then we have had basically no other maintenance."

The system is built for the long-haul as well. For the Sewer Authority's project, the grit removal system's wetted parts are constructed of durable 304 stainless steel. The other parts are commercially-blasted and prime-coated to ensure long-lasting performance and value over time.

All in all, removing fine grit in order to protect the newer biological treatment equipment allows the plant to meet its effluent quality goals. The heavy grit loads, once a physical and financial burden to plant staff and maintenance, are capably handled with new and simple, yet innovative hydraulic forced vortex technology.

Petrovich is pleased with the new developments.

"There has been very little trial and pain. It pulls all of the grit out." DN

Acknowledgements

The author thanks Paul Petrovich and Jennifer Kintzer, P.E., for their contributions to this piece.

Velocity Control Advancements In Vortex Grit Removal Demonstrate High Removal Efficiency Results

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Dale White, M.S., Smith & Loveless Inc.

INTRODUCTION and OBJECTIVES

The intrinsic problem of grit and its scouring activity means that efficient grit removal is fundamental for protecting and optimizing downstream Water Resource Recovery Facility (WRRF) processes and equipment. Recent water industry activity has placed a greater emphasis on understanding the profiles and advanced technologies to optimize the grit removal process, and the test procedures in which these systems can be properly evaluated.

The article will analyze the complete aspects of four professional grit characterization and efficiency tests conducted within the last 12 months at four regionally different U.S. WRRFs, located in the states of Florida, Wisconsin, Utah, and Louisiana. The grit removal systems of the profiled WRRFs range from seven MGD to as large as 50 MGD (per unit); covering the most common types encountered for engineered grit removal systems in the U.S.

Further each of these newer grit facilities utilize patented internal grit chamber baffling, a design development which not only helps achieve high grit removal efficiency results, but eliminates the need for larger or multiple units and

Florida

Size		Influent (g)	Effluent (g)	Cumulative Efficiency (%)
U.S. Mesh	Microns			
50	300	954.78	6.78	99.29
70	212	379.81	1.64	99.37
100	150	438.17	2.40	99.39
140	106	230.59	1.86	99.37
Residual	0	10.05	0.05	99.37
Total		2013.40	12.73	99.37

Wisconsin

Size		Influent (g)	Effluent (g)	Cumulative Efficiency (%)
U.S. Mesh	Microns			
50	300	139.19	4.07	97.08
70	212	54.42	2.70	96.50
100	150	44.58	3.64	95.63
140	106	22.50	2.95	94.88
Total		260.69	13.36	94.88

Louisiana

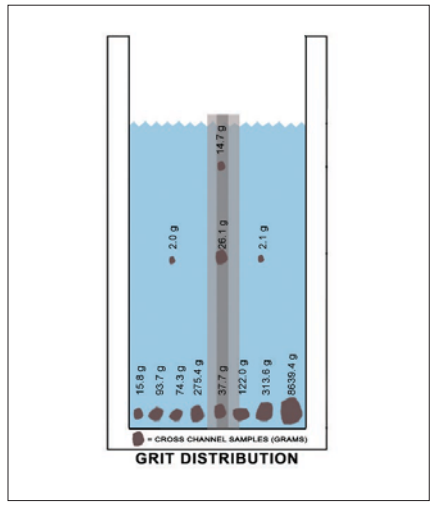
Size		Influent (g)	Effluent (g)	Cumulative Efficiency (%)
U.S. Mesh	Microns			
18	1000	208.08	1.76	99.15
50	300	129.14	11.42	96.09
70	212	7.01	3.05	95.29
100	150	4.09	1.34	94.96
140	106	2.79	0.64	94.81
Residual	0	9.21	3.47	93.98
Total		360.32	21.68	93.98

Utah

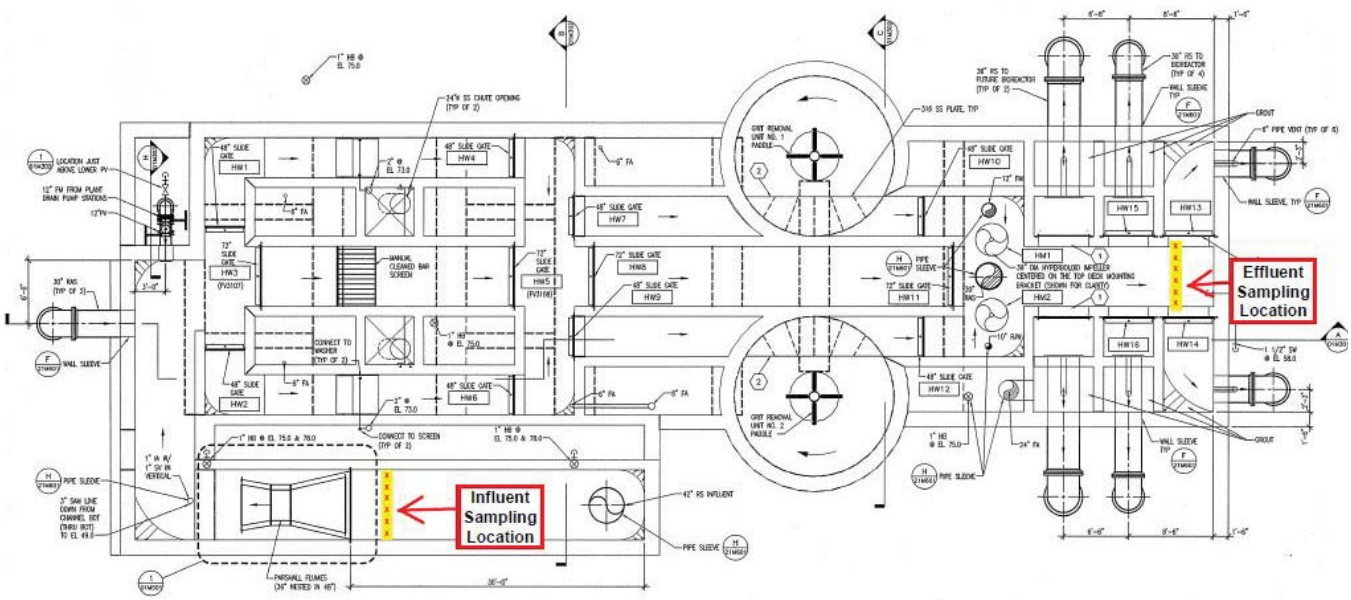
Size		Influent (g)	Effluent (g)	Cumulative Efficiency (%)
U.S. Mesh	Microns			
50	300	259.49	2.40	99.08
70	212	20.17	0.87	98.83
100	150	9.47	0.78	98.60
140	106	5.24	0.44	98.47
Residual	0	24.56	3.00	97.65
Total		318.93	7.49	97.65

Grit Test Protocol/Cross Channel Sampling Grit Distribution

downstream level control devices in the WRRF's design phase. Using the four WRRF studies, the paper will discuss designers and end-users on the different criteria required for properly sizing baffled hydraulic vortex grit systems, demonstrating why and when velocity and capacity flow should be emphasized over settling and surface overflow rates generated from traditional sizing methods.



Finally, with uniform sampling and testing procedures applied at each facility, performance benchmarks were established for these hydraulic vortex systems with integral flow control baffles. Despite different grit profiles established in each study, each system achieved results of 95 percent removal efficiency and greater. DN



Influent Channel Baffle Retrofit Optimizes 270 Degree Grit Chamber For Significantly Improved Removal Efficiency

Authors:
Rodney. Mrkvicka, P.E., Smith & Loveless Inc.
Dale White, M.S., Smith & Loveless Inc.

INTRODUCTION and OBJECTIVES

The Southside Wastewater Treatment Plant is one of two wastewater treatment plants operated by Dallas Water Utilities in Dallas, Texas. The utility processes up to 150 million gallons of wastewater per day, utilizing more than 4,000 miles of sewer pipes to serve the City of Dallas. The headworks of the Southside Treatment Plant includes four (4) Model 30.0 Smith & Loveless PISTA® 270™ Grit Chambers that have been in operation for the past 17 years. Following Smith & Loveless' development of the OPTIFLOW 270™ Baffles for 270° Grit Chambers, Smith & Loveless agreed to perform side-by-side grit removal efficiency testing and grit size classification on two (2) of the PISTA® 270™ Grit Chambers at the Dallas Southside Plant. Dallas Water Utilities along with the engineering consultant firms CP&Y and Garver agreed with the testing project to provide information on potential improvements to the existing facilities. Sampling was performed from February 25 through March 2, 2015. During the test Grit Chamber #5 was operated in the original PISTA® 270™ design without baffles while Grit Chamber #3 was simultaneously operated with the OPTIFLOW 270™ Baffles.

Dallas, TX – Dallas Water Utilities

Size		Influent (g)	Effluent (g)	Cumulative Efficiency (%)
U.S. Mesh	Microns			
50	300	336.62	9.48	97.18
70	212	79.67	11.71	94.91
100	150	80.16	21.50	91.40
Residual	0	35.23	12.32	89.65
Total		531.68	55.01	89.65

Methodology

Cross-Channel Sampling yields an accurate portrayal of the waste stream's grit profile and its flow path within the channel. Multiple grit sample pairs are collected at different points across the width of the channel as shown in Figure 4. One (1) grit sample pair equals one (1) sample taken from the influent and one (1) sample taken from the effluent. The difference between the mass of influent and effluent sample is the grit removal efficiency of the unit. Samples are collected from a single probe location typically for 30 minutes, but test duration can be several hours depending on the amount of grit at a given probe location.

"The PISTA® 270™ with OPTIFLOW 270™ Baffles is rated to remove 95% of grit measuring greater than 100 mesh (150 microns)."

The sample probe had a low profile so that it has minimal effect on the velocity in the channel. The flow rate through the probe was set such that it did not affect the grit flow. This is done to collect a representative sample of the grit flowing in the waste stream at the point location where the probe is placed.

Conclusion

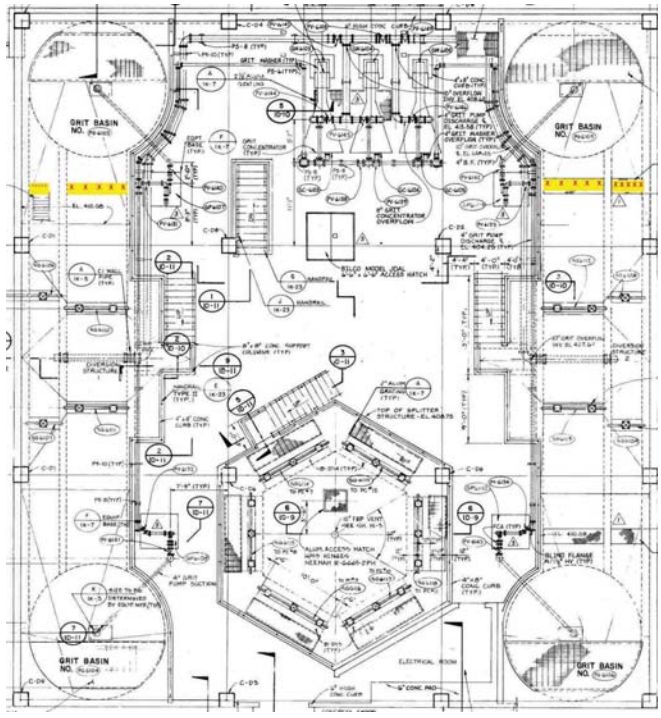
Two (2) Model 30.0 PISTA® 270™ Grit Chambers were tested side-by-side at the Southside Treatment Plant in Dallas, Texas. Unit #3 was operating with OPTIFLOW 270™ Baffles, and Unit #5 was operating in the original PISTA 270™ design without baffles during the test. A total of five (5) sample pairs were collected from each grit removal unit for a total of ten (10) grit samples from each unit.

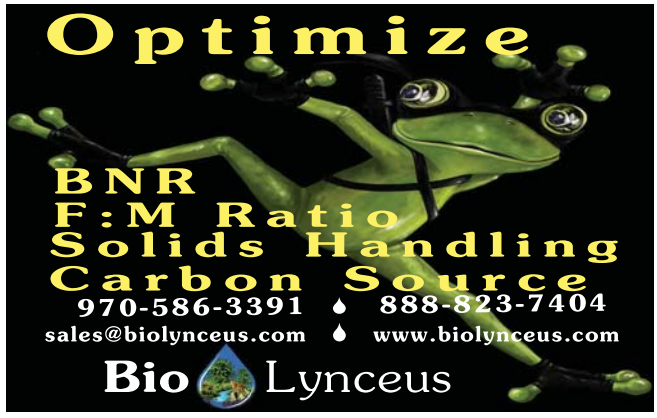
More than 530 grams of influent grit was captured and 55 grams of effluent grit was captured from Unit #5 (operating without baffles). According to dry sieve analysis, 63% of Unit #5's influent grit measured larger than 50 mesh (300 microns) in size and 93% measured larger than 100 mesh (150 microns) in size.

The PISTA® 270™ original design is rated to remove 95% of grit measuring greater than 50 mesh (300 microns), 85% of grit smaller than 50 mesh but larger than 70 mesh (212 microns), and 65% of grit smaller than 70 mesh but larger than 100 mesh (150 microns). Unit #5 at the Southside Treatment Plant was operated with the PISTA® 270™ original design and removed 97% of grit larger than 50 mesh (300 microns), 85% of grit smaller than 50 mesh but larger than 70 mesh (212 microns), and 73% of grit smaller than 70 mesh but larger than 100 mesh (150 microns) during the test, exceeding the manufacturer's specified performance for a grit removal unit of this type.

More than 1,100 grams of influent grit was captured and 36 grams of effluent grit was captured from Unit #3 (the baffled unit). According to dry sieve analysis, 68% of Unit #3's influent grit measured larger than 50 mesh (300 microns) in size and 87% measured larger than 100 mesh (150 microns) in size.

The PISTA® 270™ with OPTIFLOW 270™ Baffles is rated to remove 95% of grit measuring greater than 100 mesh (150 microns). During the test at Southside WWTP, Unit #3 was operated with OPTIFLOW270™ Baffles and cumulatively removed 97% of grit larger than 100 mesh, exceeding the manufacturer's specified performance for a grit removal unit of this type. Additionally, Unit #3 performed better than Unit #5 overall, removing a greater proportion of all grit particle sizes than the unit without baffles. Dn





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Tour in September organized by the YP committee

By Gary Vance

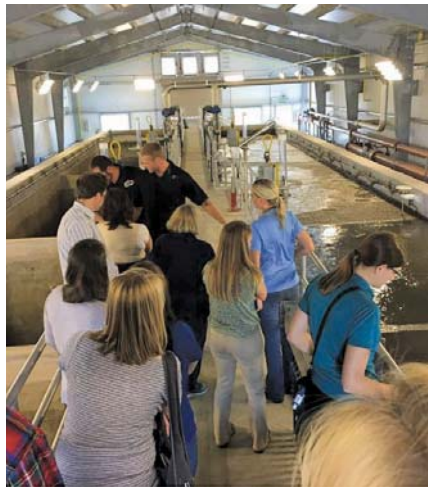
In September, the WEAU Young Professionals Committee and Utah Women of Water jointly organized a tour of the newly constructed Coalville WWTF. The tour was hosted by Coalville City staff and J-U-B Engineers. Lunch was provided to the more than 20 attendees while City staff described the project and how it has benefited the community.

The Coalville WWTF is one of the first plants in Utah designed to meet the upcoming nutrient limits for both nitrogen and phosphorus and sets an example of how this can be achieved in smaller rural communities. The treatment facility was integrated into the community/next to center of town with minimal aesthetic impacts. There is an equestrian/barn architectural theme based on other structures in the area, the rooflines are kept low, and all treatment areas are covered to minimize odors. Nearly $8M in grant funding was obtained for the project.

The treatment facility is an activated sludge process that was designed with the flexibility to operate in three different modes or configurations:

- MLE (Modified Ludzack Ettinger) to primarily target nitrogen removal
- A2/O process to target both nitrogen and phosphorus removal
- Step Feed Mode to manage peak flow events of up to 5X the AADF.

The new wastewater treatment facility preserves water quality in the Weber River/Echo Reservoir – both critical recreational waters for the City that attract visitors to the area. DN



Midyear Social

The WEAU Young Professionals evening social this year was held at Red Robin immediately following the Midyear Conference. This was a great opportunity for YPs attending the conference to network and meet others in the industry and WEAU organization. The social was huge success with about 20 people including conference speakers, university students, operators, vendors, consulting engineers, and President Matt. This was the best attendance we've had for the past several years and everyone had a great time. 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 this spring! DN

Taking Water from the Big Sandy River

With a name like the "Big Sandy River," it's no surprise that extracting water for drinking presents challenges for treatment plant operators. Two treatment plants situated along this tributary of the Ohio River found solutions to coping with turbid flows carrying high quantities of river sands and sediments.

In many parts of the US, drinking water is extracted from rivers to be treated, stored and distributed. But few areas present greater challenges than South East Kentucky. Common practice for treatment plant, where there is room, is to use pre-sedimentation basins to allow sands and other sediments to settle out prior to the treatment process. If the pre-sedimentation area is not sufficient, the basins can bypass huge amounts of river sand during heavy rain periods. Once sand enters the process it wears out mechanical equipment and clogs downstream processes.

SOLUTIONS TO COST AND DAMAGE

As well as abrasion, accumulated sand and sediment can lead to reduced volumes in process tanks, higher volumes of sludge and high energy usage; each of these issues adds significantly to operational costs. With high sand and sediment content in river flow, pre-sedimentation basins rapidly fill up, making the sedimentation process less effective and allowing bypass; the accumulated sand and sediment have to be manually cleaned, a costly process that can take the basin out of the treatment process for significant time. The material removed must be further dewatered and disposed.

LOADED WATER

Sand, silt and coal accumulation is a common problem in the Appalachian rivers, as high density of industry and mining upstream creates a high concentration of sediment. The river is very turbid – especially when it rains.

"The Big Sandy River didn't get that name accidentally," said Ralph Varney the Plant Operations Manager for Pikeville Water Treatment Plant. "When there's a lot of rain, the river gets atrocious. I mean, it's awful."

Described by locals as "the city that moves mountains," Pikeville received national recognition for rerouting the Big Sandy River and the result, the Pikeville Cut-Through, enabled the construction of a new Water Treatment Plant in 1987.

However, shortly after the Pikeville plant began operating, the superintendent noticed that equipment was getting clogged with large amounts of river sand. As there was no pre-sedimentation tank the flocculation tanks would accumulate as much as six feet of river sand every three months and the city needed a better solution than manually removing it every quarter.

River sand often clogged the plant's two flocculator basins so much that when they were turned off, they could not be turned back on. As a result, the basins needed to be checked regularly and monitored constantly. Cleaning the basins proved to be especially expensive and time-consuming.

"When we cleaned the basins ourselves, it was extremely costly," Varney continues. It usually took two or three of us about a week. We would have to spend $15,000 to $20,000 for an outside company to do the cleaning for us." The basin's mixer paddles would also become worn and twisted, requiring constant replacement.

Treatment options included an infiltration well, but there was too much clay in the ground which would keep the water from percolating. A pre-sedimentation basin was also considered. However, at a treatment plant 20 miles upriver at Prestonsburg. Verner saw vortex separation technology being used effectively. By using dynamic energy found in pumped influent to separate solid from liquid, no moving parts were required and maintenance requirements were minimized.

SUCCESSFUL SEPARATION TECHNOLOGY

After looking at a couple of vortex separation models, Varney decided on the Eutek TeaCup® from Hydro International. The Eutek TeaCup® works with a combination of free vortex separation and a boundary layer to capture, classify, and remove river sand. It also requires no chemicals and produces a clean, low organic slurry. In Pikeville, this technology allowed separated sand to be directly returned to the river prior to the water treatment process.

Water flows through coarse screens in the river to an intake inside a wet well building. From the wet well water is pumped at 4,000 gpm to the Eutek TeaCup®. The Eutek TeaCup® uses centrifugal force to separate the sediment 106 micron and larger, achieving 95% removal.

The sediment settles to the bottom of the device where it is swept to a center collection cone via the boundary layer. The pretreated water then flows to the rest of the treatment process for further treatment.

SAVING ON OPERATION COSTS

The operators were able to retrofit the 96 in. Eutek TeaCup® system into the plant's existing treatment process and, shortly after installation, the plant started realizing its benefits. "When we first started it up, we had all the basins clean and we went a year before having to worry about them," said Varney. "Now the basins are cleaned annually and only around four inches of sand is removed, depending on how much rain the area received."

BIG STUFF REMOVAL

The solution that Varney saw was at a plant owned and operated by City of Prestonsburg Utilities Commission. Here, a system was needed to remove sand from the pumped raw river water prior to its entering the plant for treatment to save maintenance time and money spent cleaning out the settling basins, minimize wear and tear on mechanical equipment, and reduce sediment volume.

By installing a Hydro Grit King® vortex separator unit before the water treatment process, the performance of the entire plant was improved, significantly reduced long-term maintenance costs in downstream equipment and reduced sludge volume.

The free-standing system was designed to remove 95% of sand particles greater than 150 microns (100 mesh) with specific gravity of 2.65 at flows up to 6 mgd. Headloss for the installed unit is less than 12 inches at peak flow. This objective was achieved with a 108 in. diameter unit constructed out of 304 stainless steel.

In both plants vortex separation technology is being used successfully to cope with high peak flows and low particle size in systems that require low power and maintenance requirements.

For further information email *wastewaterinquiry@hydro-int.com*, visit *www.advancedgritmanagement.com* or *www.hydro-int.com* or call (503) 615 8130. DN

Hydro International

ABOUT THE COMPANY

Hydro International provides costeffective solutions for controlling the quantity and improving the quality of water with minimal maintenance. Developed over more than 30 years of research and development, many of Hydro's award-winning solutions in the water, wastewater and stormwater sectors are based on sustainable vortex technologies. Hydro Americas' Water and Wastewater division is headquartered in Hillsboro, Oregon, USA.

PRESS INQUIRIES TO

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In Memoriam – Rick Wheadon

Rick Dean Wheadon, 59, beloved husband, son, father, grandfather, brother, uncle, and friend died on October 19, 2016 in Alpine, Utah, surrounded by his family. Rick was diagnosed with pancreatic cancer on April 1, 2016.

He was born on July 14, 1957, in Murray, Utah, to Dean Asial Wheadon and Sherrie Helen Fitzgerald. He was raised in Provo, Utah as the oldest of seven children. Growing up, he worked on his uncle Ferris' farm, where he learned the value of hard work. He carried that work ethic with him throughout the rest of his life. He started his own sprinkler company while attending Provo High School (Class of 1975). He served a mission in Helsinki, Finland during 1976-1978, where he developed a great love for the Finnish people. He received a Bachelor's Degree in Civil Engineering and a Master's Degree in Engineering Management at Brigham Young University.

Rick married his sweetheart Jana Fuhriman on September 12, 1979 in the Provo LDS Temple. They enjoyed 37 wonderful years together. They made their home in Provo, Orem, Antioch (CA), and Sandy, before settling in Alpine, where they have lived for the past 23 years. Their greatest joy has been their five children and nine grandchildren.

Rick's career began at a small engineering firm, Community Consultants, which he ran with his father. Rick and his family moved to California in 1988 where Rick took a job at Carollo Engineers. During his 28 years at Carollo, he served in various leadership and technical roles for water/wastewater projects throughout the U.S. Rick's specialty was managing large water treatment and infrastructure projects. He served as a member of the Board of Directors, as a partner, the Chief Financial Officer, Office Manager, and most recently as the Managing Director of Client Services. Rick served in leadership positions in the American Water Works Association and was a member of the American Society of Civil Engineers. He was honored with the George Warren Fuller Award, the Charlie Wilson award, and was awarded the Outstanding Service Award from the American Water Resources Association. Rick and Jana treasure the friendships they made throughout Rick's career with co-workers, clients, partners, and other members of these organizations. He is remembered professionally for his creativity, integrity, sensitivity, but most of all, his capacity to care for and build up others.

Rick was active in the LDS church where he served in many positions including two turns as a bishop's counselor in Alpine and three years as bishop of the YSA 22nd ward in Provo. Most recently Rick and Jana worked with the young adults in the YSA Fort Canyon Ward in Alpine. He has spent decades working with the youth of the church, and loved the scouting program. Rick was an Eagle Scout and attended the Woodbadge Scouting Leadership Program.

Rick always took time to stop and enjoy the world around him. Rick loved the outdoors and had a great reverence for nature. He enjoyed boating, hunting, fishing, golf and skiing. Since Rick's diagnosis in April, Rick and Jana enjoyed every day they had together. Many times Rick would say, "I can be sick at home or I can be sick while I'm fishing, so let's go fishing." Rick lived with passion and joy, and had great love for the people and places around him. He loved spending

time in the mountains and canyons near his home, and the red rocks of St. George and Lake Powell. He especially loved sharing his favorite spots with people. Rick and Jana loved their date nights to watch BYU basketball and football. He also developed a great love for family history work. Rick was a handyman and loved to build, create, and renovate. He treasured time with his children and grandchildren. He always believed that his family was his greatest blessing, but also felt great love and support from his Carollo family, his church family, and his many other friends and colleagues throughout his life.

Rick was a strong, hard worker, but was always able to make those around him feel comfortable and confident. He was a master communicator, and was known for remembering each individual and expressed sincere interest in their challenges and aspirations. He was loyal and fiercely protective of his loved ones. Above all, though, he loved the Savior and never wavered in his faith. His love for Jesus Christ and the testimony of Him remains an example to all who knew Rick. His mantra was to never shrink, but to have faith in the plan that Our Heavenly Father has for us. He valiantly faced his battle with cancer with courage and optimism. His bright smile never faded and his strength inspired everyone that knew him.

He is survived by his wife, Jana, his five children, Jake (Erin) Wheadon, Whitney (Bill) De Groot, Kelsey (Evan) Shelley, Tanner (Marcia) Wheadon, Madison Wheadon, and nine grandchildren: Ava, Noah, Henry and Elodie Wheadon, Nina and Elin De Groot, Agnes, Emmerich and Edith Shelley. Rick was also survived by his mother, Sherrie (Dale) Howlett, and his siblings: Keri (David) Frampton, Mark (Ann) Wheadon, Kristie Gordon, Kate Wheadon, Kimberly Wheadon, and Joseph (Clare) Wheadon and his stepmother, Maureen Wheadon. He was preceded in death by his father, Dean Wheadon.

The Wheadon family would like to thank Dr. Ignacio Garrido Laguna and the pancreatic cancer team at Huntsman Cancer Institute. We appreciate the loving care you gave to our husband and father. *#stronglikerick* DN

Wastewater & Collection Exam Preparation

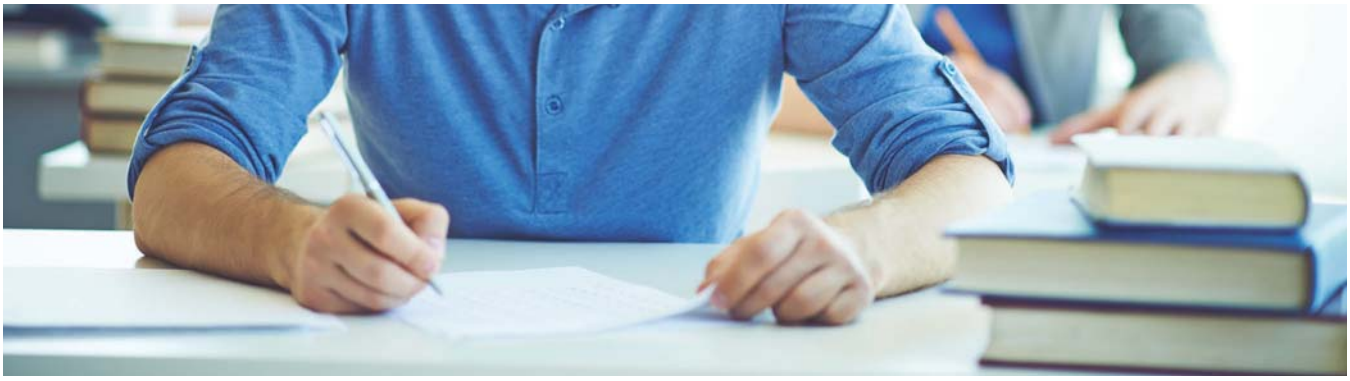
Do you want to Pass your Certification Exam?

Collections College is held at Cottonwood Improvement District on Wednesdays from 12:30pm to 3:30pm. Contact Lonn Rasmussen at *lonn@cid.utah.gov* or 801-943-7671. Lonn does a great job with the Collections College.

There is not a Treatment Certification Exam Preparation available this fall. But there are other options to help you study for the Exam.

California State University at Sacramento at *www.owp.csus.edu/courses/wastewater.php*

American Water College at *https://americanwatercollege.org/weau*. They have offered WEAU a discount you can go to their website, scan the QR Code or call them at 661-874-1655. The discount code is WEAUtah. Classes are available for Grade 1 through 4 for wastewater and collections. This is an online program to help you work at your own pace with printable lessons, online videos that go over each lesson, with flashcards, quizzes, tests, support of an instructor and study helps. DN



WEAU Scholarship/Grant

2016 WEAU Awards Nominations

Nominations Due Friday, December 30, 2016.
Forms available online at *www.weau.org* or from Daniel Griffin
For more information contact Dan at 801-536-4387
or by email *dgriffin@utah.gov*
Fax all completed forms to 801-536-4301

Water Environment Association of Utah General Association Awards

2016 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 30, 2016.

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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- ☐ Discharging Lagoon
- ☐ Non-Discharging Lagoon
- ☐ Laboratory Technician
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- ☐ Operator Over 5 MGD
- ☐ Safety
- ☐ Collection System Under 5 MGD
- ☐ Collection System Over 5 MGD
- ☐ Maintenance Specialist
- ☐ Collection Operator Under 5 MGD
- ☐ Collection Operator Over 5 MGD
- ☐ Supervisor
- ☐ Pretreatment Program
- ☐ Pretreatment Specialist
- ☐ Biosolids Program
- ☐ Young Professional

2016 NOMINEE INFORMATION

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Facility Name: _____

Facility Manager: _____

Address: _____

City/State/Zip: _____

Phone: _____ FAX: _____

Supervisor's Name/Signature: _____

NOMINATOR INFORMATION

Name: _____

Facility Name: _____

Facility Manager: _____

Address: _____

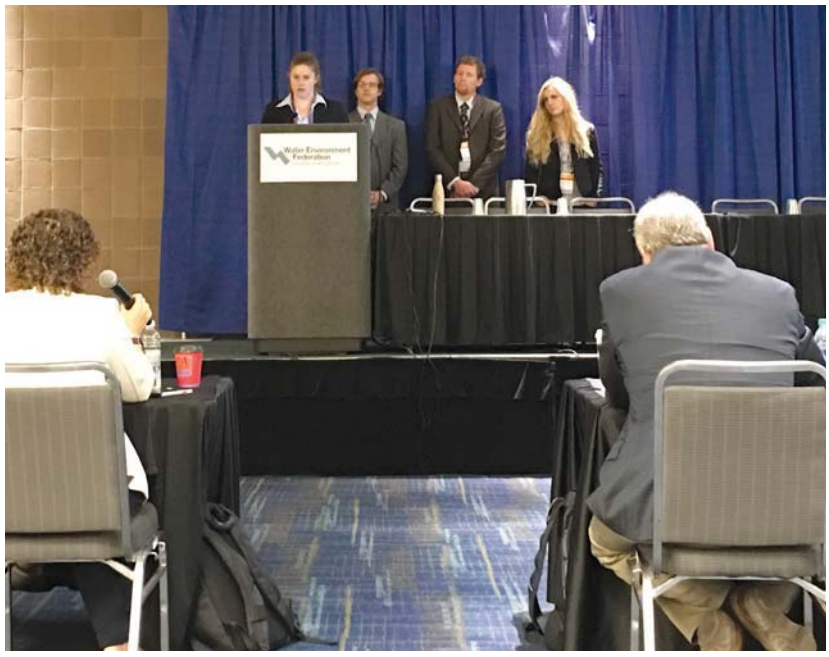
City/State/Zip: _____

Phone: _____ FAX: _____

Briefly describe why you think the nominee should be considered for an award

_____

Utah Student Design Team WEFTEC 2016



Darren Bingham, Erin Andersen, Dominque Bentrand, and Dan Horne - not shown Ahmad Bitar

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Goble Sampson Associates	14	801-268-8790	www.goblesampson.con
Hansen, Allen & Luce	39	801-566-5599	www.hansenallenluce.com
Holland Equipment Co.	47	800-234-8611	www.hecplows.com
Hydro International	15	866-615-8130	www.hydro-int.com
isiWEST	37	801-718-6518	www.isiWEST.com
LaTech Equipment & Controls	21	800-801-3982	www.latechequipment.com
Medora Corporation (SolarBee and GridBee brands)	9	866-437-8076	www.medoraco.com
Mountainland Supply Company	2	801-224-6050	www.mountainlandsupply.com
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