

SUMMER
2024

The Official Publication of the Water Environment Association of Utah

DIGESTED news

Celebrating 50 Years of Clean Water

2024 WEAU ANNUAL CONFERENCE SUMMARY

Central Valley WRF
800 West Central Valley Road
Salt Lake City, Utah 84119
Address Service Requested

INSIDE:

Save the Date: WEAU 2024 Engineering Symposium



Discover the Cost-Effective Difference ACO Stormbrixx Makes For You.



Schoonover Case Study

The Schoonover Plumbing ACO Stormbrixx project was brought to Mountain Supply out of a need to find a cost-effective way to eliminate an on-site drainage pond, while staying in compliance with the current State of Utah Stormwater Requirements. In order to eliminate the pond, it was determined that an underground stormwater detention system would be necessary. Working with Mustang Design and ACO an appropriately sized below ground retention system was designed for the site that included two access and maintenance points. Once approved, the system was installed with on-site assistance from Mountainland Supply.

By using Stormbrixx the owner was able to eliminate the pond by detaining the stormwater under their parking lot in a Stormbrixx system. This system not only saved the owner from wasting land but created a structurally sound “modular vault” that will be able to be maintained for years to come. By retaining and infiltrating the storm water 100% on site the owner was able to eliminate the extra cost incurred by connecting to the city’s storm sewer system.



Call Your Mountainland Sales Rep.
for a FREE Site Evaluation and Solution!





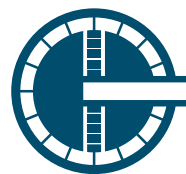
WE ARE BUILDERS, WATER EXPERTS

PLANNERS, PARTNERS, CRAFTSMEN

We are an established industry leader with deep general contracting, construction management and design-build experience in three key areas: pump stations, wastewater treatment facilities and water treatment plants. Our top reputation in this technically complex area stems from a combination of sophisticated project management skills and extensive self-performance capabilities.



#1 RANKED
Wastewater Treatment
Plant Builder



#2 RANKED
Water Treatment
Plant Builder



#3 RANKED
Sewerage and
Solid Waste Builder



#4 RANKED
Water Supply
System Builder

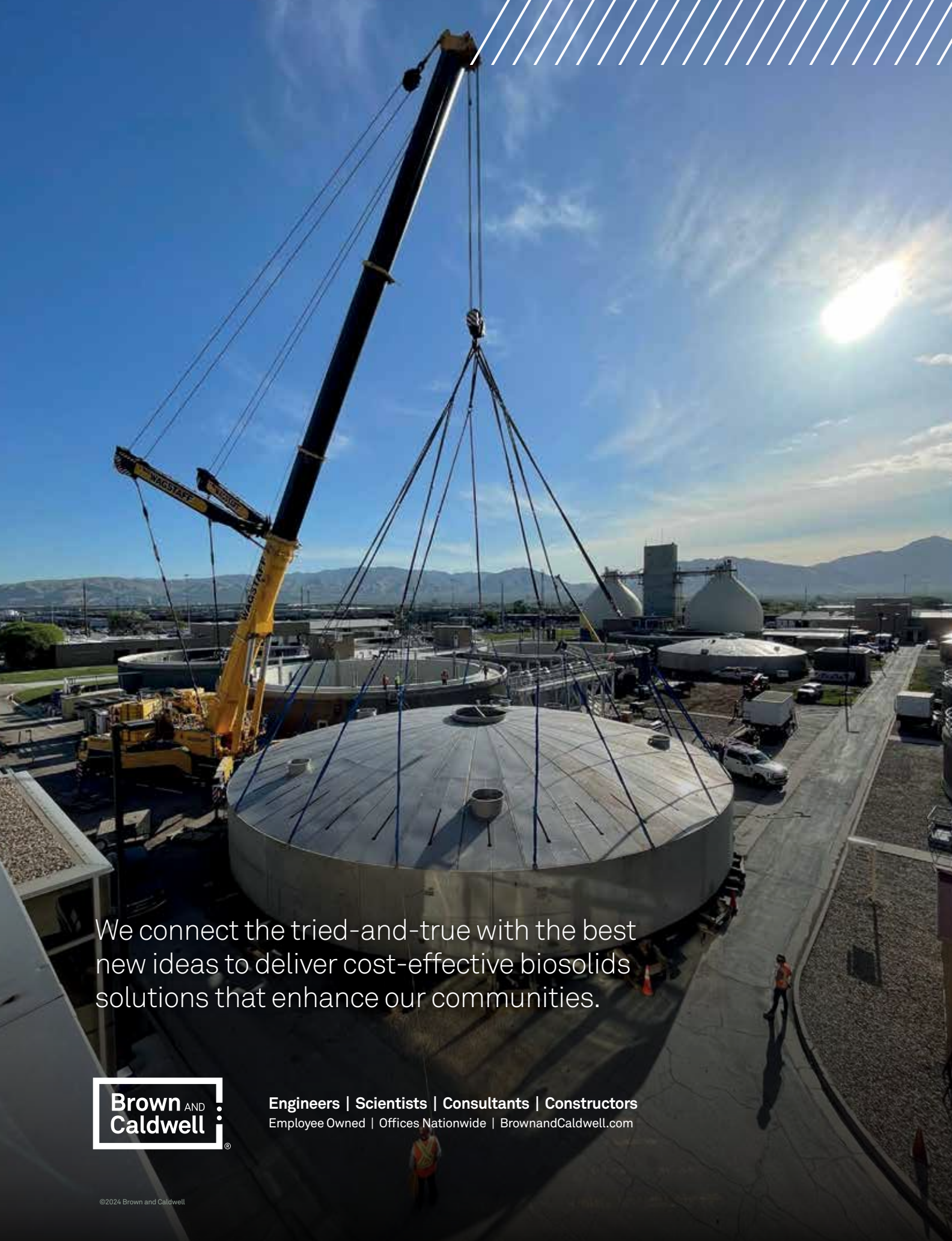


#15 RANKED
Largest U.S.
National Contractor

*2023 ENR TOP CONTRACTORS LIST



ARCHER WESTERN



We connect the tried-and-true with the best new ideas to deliver cost-effective biosolids solutions that enhance our communities.



Engineers | Scientists | Consultants | Constructors
Employee Owned | Offices Nationwide | BrownandCaldwell.com

**WEAU
BOARD OF DIRECTORS
2024-2025**

President
Chad Burrell
cburrell@sbwrd.org

President-Elect
Steve Myers
smyers@hach.com

Vice President
Gary Vance
gvance@jub.com

Treasurer
Randy Zollinger
rzollinger@carollo.com

Past President
Sherry Sheffield
sshield@svwater.com

WEF Delegate
Clint Rogers
clint.rogers@stantec.com

WEF Delegate
Jeff Beckman
jbeckman@bowencollins.com

PWO Representative
James Magill
magillj@cvwrfut.gov

PWO Representative-Elect
Taylor Byrum
tbyrum@ndsd.org

Director
Brandon Wyatt
bwyatt@bowencollins.com

Director
Marlo Davis
mdavis@sbwrd.org

Director
Tiffini Adams
tadams@sbwrd.org

Director
Matt Wiest
matt.waterford@gmail.com

Director
Nate Cloward
nate@cdsewer.org

Editor
Bryan Mansell
mansellb@cvwrfut.gov

Published by:
Craig Kelman
ASSOCIATES

On behalf of the WEAU



Tel: 866-985-9780
Fax: 866-985-9799

www.kelmanonline.com

Managing Editor, **Katie Woychyshyn**
Design/Layout, **Kellee Breckman**
Advertising Sales, **Kris Fillion**

Advertising Co-ordinator, **Stefanie Hagidiakow**



FEATURES

2024 Annual Conference Summary..... **21**
Save the Date: WEAU 2024 Engineering Symposium **39**
In Memoriam – Mike Howell Foerster **43**



Departments

President’s Message..... **7** Young Professionals..... **18**
Editor’s Message **9** WEAU Platinum Sponsors..... **45**
Collections Corner **11** News and Notes..... **47**
Certification Training..... **14** Advertiser Product & Service Center **49**
PWO..... **17**

Available Online **DIGESTED news**



With print and electronic communication operating hand-in-hand, you can take advantage of the fact that *Digested News* magazine is available online in a highly interactive format.

A user-friendly, interactive Media Rich PDF format that includes:

- 1.** Active hyper-links to all websites and emails contained in the publication
- 2.** Active links to the specific stories from the front cover and contents page
- 3.** Active links to advertiser websites from their ads


Increase efficiency and ensure compliance with experienced and trusted partners you can depend on



Endress+Hauser and Rust Automation & Controls, Inc. provide all relevant measuring parameters (flow, liquid analysis, level, pressure, temperature, gas analysis) for the safe and efficient treatment of water and wastewater.

The first electromagnetic flowmeter for unrestricted measurement



Endress+Hauser 

Endress+Hauser Proline Promag W 0xDN

- The first and only electromagnetic flowmeter with no inlet and outlet runs (0xDN), no measuring tube restriction (full bore) and thus no pressure loss
- Best measuring performance independent of flow profiles
- Perfect solution for installation in space-restricted situations (for example: on skids; especially after fittings and other turbulence-generating obstacles in the pipe)

Ease-of-use and cost effective solutions for even those remote areas



Proline Promag W 800
Battery-powered electromagnetic flowmeter



Micropilot FMR20
Continuous, non-contact radar with Bluetooth®



Micropilot FWR30
First cloud-connected radar level sensor for storage tanks

Endress+Hauser 



For additional information, please visit: www.rustco.com
Contact us at 1-321-395-1458 or hello@rustco.com

RUST
AUTOMATION & CONTROLS INC.

Rolling with WEAU



Chad Burrell

I want to thank everyone that attended or played a part in the planning of our annual conference in St George this year. We should be very proud of the fact that we are members of such a successful organization where all the roles are filled by volunteers.

Disclaimer: As the new President, you get what you paid for!! Ha ha ha.

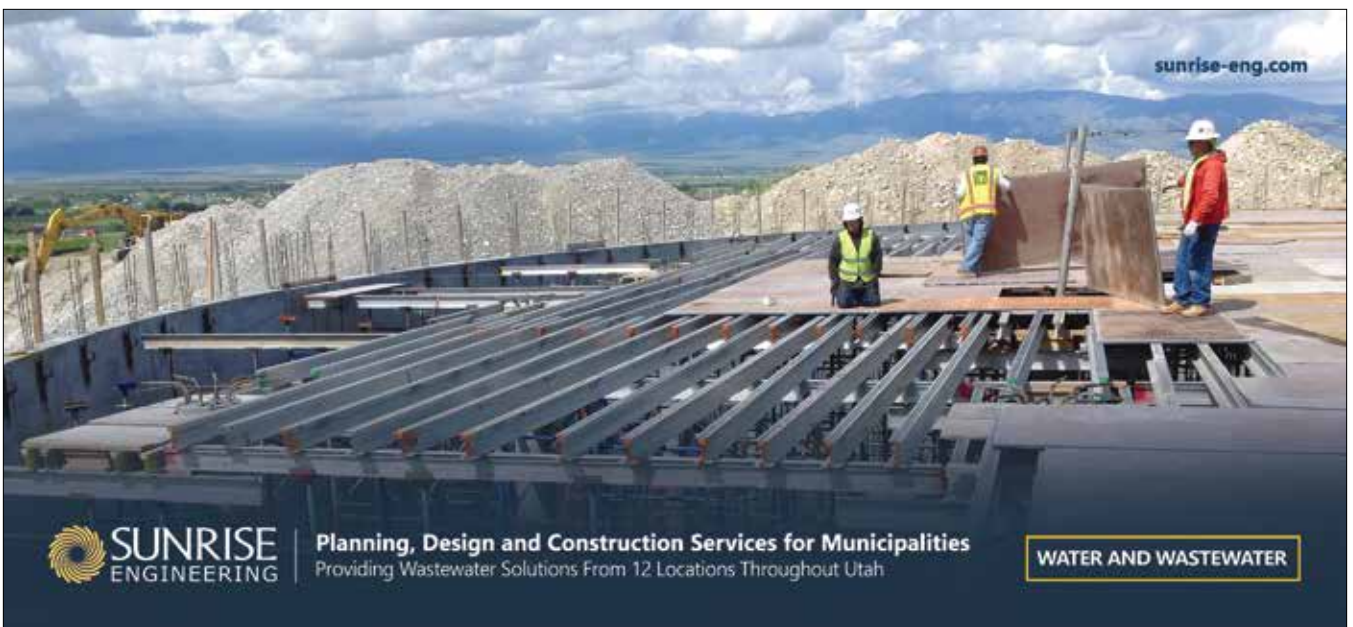
On a serious note, as the new President of WEAU, I want to take a moment to share a bit about myself, my personal life, my career, and what I like about my involvement with WEAU. I have been happily married for 26 years and have a daughter and four sons. Two of my kids are married, and I have one grandson! We have many hobbies as a family, one of which is collecting, repairing, and driving old cars, trucks, and motorbikes (I couldn't resist including some pictures). Our family motto is "Burrells may be short, but they will never be short on trucks!"

As a 19-year-old, I spent two years in Uruguay as a missionary. During that time, I witnessed firsthand the lack of clean drinking water, the lack of wastewater treatment, and the painful and acute devastating results

of intestinal bacterial infections. So, it was quite natural for me to return home and "fall" into a career in wastewater when I was introduced to the industry while attending Utah Valley State College (UVSC). Today, I have been in wastewater for almost 25 years, 15 of those years with the City of Orem Water Reclamation Facility, where I held several roles in Operations, Pretreatment and Biosolids. For the last 10 years, I have been with Snyderville Basin Water Reclamation District, where I have been the Pretreatment Coordinator and currently work as the Operations Manager over the Treatment departments.

For the majority of my career, I have been involved in WEAU. I wanted to highlight some of the ways that being involved in WEAU can build and enhance your career.

- **Operator Training:** This is a big priority of WEAU. We always have some form of training, tour, seminar, conference, or math class that you can be involved in that will increase your



President's Message



knowledge and help you with the certification tests, earn CEUs, or become a better employee right where you are serving now.

- **Networking:** You do not need to look far in our organization to find someone at another facility, a vendor, or a consultant that might have a similar issue that you have or have a solution for the issue.
- **Keeping Up-to-Date:** In our ever-changing world of emerging contaminants and concerns, it is vital that we are up to date on regulations and treatment technologies to address the issues of the future. We hope your involvement in WEAU will help you stay connected and be at the cutting edge of your line of work.

I look forward to serving with all of you this coming year. Let me know if you have suggestions, or want to be involved yourself – in the spirit of WEAU's volunteer tradition, we would love to put you to work to keep our WEAU community thriving. 



NICO | NICKERSON COMPANY 


**Celebrating 100 Years
of Pump Sales and Service**

nicody Pumps **PENTAIR HYDROMATIC**

Nicopumps.com 1-800-584-6793

We see the bigger picture.

We see more in water than the science. For 90 years, we've been inspired to safeguard the quality of life for our families and communities, while protecting our fragile ecosystems.

Salt Lake City / 801.233.2500 

Work Smarter, Not Harder

Jess Cooper, Assistant Editor

When Bryan asked if either of us assistant editors (myself and Katie Reams) could write the Editor's message, I said "sure" without much thought. Then I reread a few of Bryan's past messages, which are charming, interesting, and always undergirded with a great takeaway about life or our industry (often both!). That's when I became terrified – I'm not at all charming, interesting, or good at storytelling in that affable way that brings a smile to your face, much less imparts a valuable and relatable lesson.

So, I'm going to talk about my dog instead.

Maggie is my adorable, five-year-old Newfoundland and Poodle mix (a Newfiepoo, they call it). She's designed to look and act like a soft, cuddly teddy bear, but she also happens to be about 88 pounds of muscle. Just like me as a chunky toddler, she's stubborn and benefits



from a low center of gravity when she sets her mind against something. Luckily, she likes me enough to obey me, mostly.

Like many dogs, the highlight of her day is her walk. We usually take a nearby nature trail where she has a knack for finding the sharpest, spiniest burrs and the stinkiest who-knows-what dead animals to coat her hair. Of course, she gleefully galivants through all these hazards without a care in the world. The trouble comes at bath time, when her



usual stubbornness morphs into raucous cries and flails of desperation, culminating in letting her body go limp to avoid stepping into the dreaded tub. Drama queen.

Maggie's not the only one with questionable judgement – each time she does this, I (someone typically in an office behind a computer, and who could use a more robust exercise routine) convince myself that I am perfectly capable of safely lifting all 88 pounds of her gently into the tub.

Oh, the hubris. As I racked up a few minor battle injuries doing this, I learned two lessons quickly:

1. **Work smarter.** Maggie's stubborn trance is broken by a tasty treat carefully balanced at the edge of the tub.
2. **Work together.** When that trick fails, I can and should enlist help in lifting her giant potato body when I need it. Between my husband and I, we can typically lift her into the tub without issue.

So, maybe I do have a lesson after all. Maybe it's even the kind you can carry with you through your day when a pump breaks down or rags are clogging your screens. Work smarter whenever you can – after all, why make your job harder when a little finesse will work? But don't forget to work together, too. [DN](#)

FIND THE HIDDEN GOLDEN SLUDGE SHOVEL!*

Each quarter, *Digested News* has this golden sludge shovel icon hidden somewhere in the content of its pages.

Be the first to find it and email the editor (digestednews@weau.org) the correct page number to **win a \$25 Amazon Gift Card.**

Emails should include:

- Subject: I found the golden shovel
- Correct page number
- Your name and work address

Winners will be notified directly and named in the next issue of *Digested News*.

*For those of you new to WEAU, volunteers who give notable time and service to WEAU are awarded a "5S" golden lapel pin shovel. With that award, they become members of the **Select Society of Sanitary Sludge Shovelers**. WEAU is always looking for volunteers and maybe one day, you too can become a 5S member. [DN](#)



CONGRATS TO:
BROCK THOMPSON OF CENTRAL VALLEY WATER RECLAMATION FACILITY FOR FINDING THE GOLDEN SHOVEL ON PAGE 47 OF DIGESTED NEWS SPRING 2024. ENJOY YOUR GIFT CARD!

Have feedback or suggestions? We'd love to hear from you about what parts of *Digested News* you find helpful, or about what you'd like to see. Email us at digestednews@weau.org.



INTEGRITY INSPECTION SOLUTIONS, INC.

"Together, We Are the Solution"

Doing Business with Integrity

New Services Offered by Integrity Inspection Solutions: UV CIPP Installation and Schwalm Robotics

1. UV CIPP Installation: Integrity Inspection Solutions is excited to announce the addition of UV CIPP (Ultraviolet Cured-In-Place Pipe) installation to our comprehensive lineup of trenchless pipeline solutions. UV CIPP is a cutting-edge technology that allows for the rehabilitation of pipelines without the need for traditional excavation. With this service, we can efficiently repair and reinforce sewer lines, stormwater pipes, and other underground conduits, ensuring structural integrity and longevity. The UV CIPP process involves inserting a resin-soaked liner into the existing pipe, which is then cured in place using ultraviolet light. This results in a seamless and durable pipe-within-a-pipe, minimizing disruption to the surrounding environment and reducing project timelines. Our expert team is ready to deliver top-notch UV CIPP installation services tailored to your specific project needs.

2. Schwalm Robotics: In our continuous pursuit of cutting-edge solutions, Integrity Inspection Solutions is proud to introduce Schwalm Robotics to our suite of services. Schwalm Robotics represents the forefront of robotic technology for pipeline maintenance and rehabilitation. Equipped with advanced cutting capabilities, Schwalm Robotics allows us to precisely and efficiently remove obstacles, protrusions, or unwanted materials from pipelines. This technology is particularly useful in addressing challenges such as roots, intruding taps, or other impediments that may compromise pipeline functionality. By leveraging Schwalm Robotics, we enhance the accuracy and effectiveness of our pipeline maintenance services, ensuring a thorough and reliable solution for our clients. Trust Integrity Inspection Solutions for state-of-the-art robotic pipeline services designed to meet the evolving needs of the industry.

Integrity Inspection Solutions: Your Pipeline Solutions Partner

Locally owned and operated, Integrity Inspection Solutions stands committed to excellence, offering top-notch solutions to private firms and municipalities in Idaho and surrounding states.

Our Services:

- **CCTV Inspection (NASSCO Certified)**
- **Lateral Launch Inspection**
- **Hydro Cleaning & Root Cutting**
- **Hydro Excavation**
- **CIPP Point Repair**
- **Infiltration Repair**
- **Manhole Coatings**

Why Choose Us? With Integrity at our core, we bring you the highest ethical standards in the industry. Our certified team ensures precision and reliability in every project.

Discover the Integrity Advantage:

- **UV CIPP Installation:** Seamlessly repair and strengthen pipelines with cutting-edge UV Cured-In-Place Pipe technology.
- **Schwalm Robotics:** Precision robotic cutting to remove obstacles, ensuring optimal pipeline performance.

Contact Us:

- **Office:** (208) 442-4470
- **Richard Mason, President/Owner:** (208) 960-2883
- **24/7 Emergency Line:** (208) 960-2729 –
Keysha Hadley, Director of Operations and Project Management
- **John Raymond, Outside Sales:** 208-941-1733
- **Email:** integrity@iispipeline.com

Experience Integrity, Experience Excellence!

www.iispipeline.com

Collections Quiz

Submitted by Daniel M. Olson

1. **What information must be on a warning tag attached to a switch that has been locked out?**
 - A. Direction for removing tag.
 - B. Name of the nearest physician to call in case of an emergency.
 - C. Signature of person who locked out the switch, who is the only person authorized to remove tag.
 - D. Time to unlock switch.
2. **Calculate the water horsepower if the pump it operates provides 875 GPM against 118 feet total dynamic head (TDH)?**
 - A. 101 HP
 - B. 55 HP
 - C. 7 HP
 - D. 26 HP
3. **If the pump in the previous problem is 79% efficient, then what is the brake HP?**
 - A. 33.0 HP
 - B. 70.2 HP
 - C. 9.4 HP
 - D. 43.8 HP
4. **Why are gasoline and volatile solvents objectionable where present in a sewer?**
 - A. They produce an explosion hazard.
 - B. They tend to cause the solids to vaporize.
 - C. They will coagulate floatables and cause stoppages.
 - D. They represent wasted recourses.
5. **If you were in charge of a large operation with four foremen, three whose work was exceptionally good and a fourth whose work was substandard, what should you do?**
 - A. Demote the substandard foreman and bring up a replacement from the ranks.
 - B. Discuss the problem with the substandard foreman and offer to help before any other action is taken.
 - C. Find a replacement, then fire the substandard foreman.
 - D. Wait to see if the substandard foreman does better.
6. **A pump has an efficiency of 91% and a motor has a power factor of 0.93. If the water horsepower is 334 HP and electricity has a cost of 11.0 cents per kWh, how much will it cost to run the pump for one month (31 days) at 12.0 hours/day?**
 - A. \$ 12,047.49
 - B. \$ 10,963.22
 - C. \$ 3,109.31
 - D. \$ 8,032.37
7. **Which of the following is a type of shore?**
 - A. Bar
 - B. Aluminum hydraulic
 - C. Truss
 - D. Sand
8. **You should never attempt to install, troubleshoot, maintain or replace electrical equipment panels, controls, wiring, or circuits unless _____.**
 - A. A manhole is overflowing down a street.
 - B. A pump is unplugged.
 - C. You are receiving a lot of odor complaints.
 - D. You know what you are doing, are qualified, and are authorized.
9. **37 mg/l. of chlorine is required to treat a flow of 50.0 MGD. The solution available to you, however, is only 74% chlorine. How many lbs/day of solution are required to treat the flow?**
 - A. 85,403 lbs/day
 - B. 20,850 lbs/day
 - C. 15,429 lbs/day
 - D. 1,024,012 lbs/day
10. **A venturi meter measures quantity of fluid by _____.**
 - A. Difference in pressure between a constricted and a full-size portion.
 - B. Electronic measurement.
 - C. Velocity of the fluid past a given point.
 - D. Weight of the fluid.
11. **49 mg/l of root control must be added to a 42-inch sewer that is 2,125 feet long. If the root control chemical is in a solution that consists of only 38% of the chemical, how many lbs of the solution must be added to the sewer?**
 - A. 164.38 lbs
 - B. 23.74 lbs
 - C. 183.28 lbs
 - D. 3,418.02 lbs
12. **On Monday a flow totalizer read 11,156,800 gal. On Thursday the totalizer read 114,081,002 gal. What was the daily average flow?**
 - A. 114.08 MGD
 - B. 25.73 MGD
 - C. 40.03 MGD
 - D. 34.31 MGD
13. **Enclosed, open, and semi-closed are terms used for the designation and selection of _____.**
 - A. Impellers
 - B. Lantern Rings
 - C. Sleeves
 - D. Stuffing Boxes
14. **If the grade of a sanitary sewer has a slope of 0.50% for 350 feet, what is the rise of the pipe?**
 - A. 351.8 Feet
 - B. 1.75 Feet
 - C. 0.02 Feet
 - D. 0.18 Feet
15. **What must be checked before entering a manhole?**
 - A. Atmosphere in manhole
 - B. Safety equipment
 - C. Proper barricades or warning devices around a manhole
 - D. All of the above
16. **A crew surveys a sewer from STA. 9+54.00 to STA 32+65.25 If the elevation of the manhole (farthest to the treatment plant) is 742.6 feet, what is the elevation of the second manhole if the grade is 0.0017 FT/FT?**
 - A. 3.9'
 - B. 738.7'
 - C. 746.5'
 - D. 7.4'

17. Which of the following is not typical of a “submersible” pump?
 A. Can be installed in a crooked hole
 B. Minimizes vandalism
 C. Quieter operation
 D. Requires water lubrication

18. A map with a scale of 0.625 inch = 100 feet indicates that manhole “A” is 7.50 inches from manhole “B.” What is the actual distance between manholes?
 A. 4.7’
 B. 8.3’
 C. 1,200’
 D. 83.3’

19. Biological activity in long, sluggish-flow, flat-grade sewer lines will likely _____.
 A. Decrease line sediment.
 B. Create oxygen deficiency in the air in manholes, sewers, or wet wells.
 C. Stop toxic gas production.
 D. Increase the “carrying capacity” of the line.

20. If a repair job can be done by 14 people in 17 hours, how long will it take for five people to do a similar job?
 A. 12 hours, 0 minutes
 B. 47 hours, 6 minutes
 C. 6 hours, 4 minutes
 D. 47 hours, 36 minutes

21. Biological hazards in collection system operations include _____.
 A. Noxious or toxic gases or vapors
 B. Oxygen deficiency
 C. Physical injuries
 D. Hepatitis A

22. A trench is dug at 13-foot wide x 9-foot deep x 1,654-foot long. A 21-inch sewer is going to be installed in this trench 16 inches must be left out of the top for concrete. How much backfill will be required to fill the trench?
 A. 5,958 cuyd
 B. 17,875 cuyd
 C. 160,872 cuyd
 D. 7,020 cuyd

23. How many tons of backfill would there be in the previous problem if the backfill material weighed 3,724 lbs/cuyd?
 A. 11,094 Tons
 B. 33,283 Tons
 C. 299,544 Tons
 D. 13,071 Tons

24. If a loaded dump truck could haul 18 tons each, how many truck loads would be needed in the previous problem?
 A. 616 Trucks
 B. 727 Trucks
 C. 617 Trucks
 D. 16,642 Trucks

25. Given the following information, would it be less expensive to finish the job in two days, or finish the job in one day by working overtime?

*Actual job time = 15.00 hours
 Travel time & set-up time = 1.50 hours
 Average Workday = 8.00 hours
 Hourly pay rate = \$ 18.25
 Overtime is 1.50 times the normal hourly rate*

A. Cheaper to do the work with overtime.
 B. Cheaper to do the work in two days.
 C. Costs the same either way.
 D. None of the above. **DN**

Answers

17-D, 18-C, 19-B, 20-D, 21-D, 22-A, 23-A, 24-C, 25-B, 26-C, 27-A, 28-B, 29-D, 30-A, 31-A, 32-D, 33-A, 34-B, 35-D, 36-B, 37-D, 38-A, 39-B, 40-A, 41-A, 42-D, 43-A, 44-B, 45-D, 46-B, 47-C, 48-A, 49-B, 50-A, 51-A, 52-D, 53-A, 54-B, 55-D, 56-B, 57-C, 58-A, 59-B, 60-A, 61-A, 62-D, 63-A, 64-B, 65-D, 66-B, 67-C, 68-A, 69-B, 70-A, 71-A, 72-D, 73-A, 74-B, 75-D, 76-B, 77-C, 78-A, 79-B, 80-A, 81-A, 82-D, 83-A, 84-B, 85-D, 86-B, 87-C, 88-A, 89-B, 90-A, 91-A, 92-D, 93-A, 94-B, 95-D, 96-B, 97-C, 98-A, 99-B, 100-A, 101-A, 102-D, 103-A, 104-B, 105-D, 106-B, 107-C, 108-A, 109-B, 110-A, 111-A, 112-D, 113-A, 114-B, 115-D, 116-B, 117-C, 118-A, 119-B, 120-A, 121-A, 122-D, 123-A, 124-B, 125-D, 126-B, 127-C, 128-A, 129-B, 130-A, 131-A, 132-D, 133-A, 134-B, 135-D, 136-B, 137-C, 138-A, 139-B, 140-A, 141-A, 142-D, 143-A, 144-B, 145-D, 146-B, 147-C, 148-A, 149-B, 150-A, 151-A, 152-D, 153-A, 154-B, 155-D, 156-B, 157-C, 158-A, 159-B, 160-A, 161-A, 162-D, 163-A, 164-B, 165-D, 166-B, 167-C, 168-A, 169-B, 170-A, 171-A, 172-D, 173-A, 174-B, 175-D, 176-B, 177-C, 178-A, 179-B, 180-A, 181-A, 182-D, 183-A, 184-B, 185-D, 186-B, 187-C, 188-A, 189-B, 190-A, 191-A, 192-D, 193-A, 194-B, 195-D, 196-B, 197-C, 198-A, 199-B, 200-A, 201-A, 202-D, 203-A, 204-B, 205-D, 206-B, 207-C, 208-A, 209-B, 210-A, 211-A, 212-D, 213-A, 214-B, 215-D, 216-B, 217-C, 218-A, 219-B, 220-A, 221-A, 222-D, 223-A, 224-B, 225-D, 226-B, 227-C, 228-A, 229-B, 230-A, 231-A, 232-D, 233-A, 234-B, 235-D, 236-B, 237-C, 238-A, 239-B, 240-A, 241-A, 242-D, 243-A, 244-B, 245-D, 246-B, 247-C, 248-A, 249-B, 250-A, 251-A, 252-D, 253-A, 254-B, 255-D, 256-B, 257-C, 258-A, 259-B, 260-A, 261-A, 262-D, 263-A, 264-B, 265-D, 266-B, 267-C, 268-A, 269-B, 270-A, 271-A, 272-D, 273-A, 274-B, 275-D, 276-B, 277-C, 278-A, 279-B, 280-A, 281-A, 282-D, 283-A, 284-B, 285-D, 286-B, 287-C, 288-A, 289-B, 290-A, 291-A, 292-D, 293-A, 294-B, 295-D, 296-B, 297-C, 298-A, 299-B, 300-A, 301-A, 302-D, 303-A, 304-B, 305-D, 306-B, 307-C, 308-A, 309-B, 310-A, 311-A, 312-D, 313-A, 314-B, 315-D, 316-B, 317-C, 318-A, 319-B, 320-A, 321-A, 322-D, 323-A, 324-B, 325-D, 326-B, 327-C, 328-A, 329-B, 330-A, 331-A, 332-D, 333-A, 334-B, 335-D, 336-B, 337-C, 338-A, 339-B, 340-A, 341-A, 342-D, 343-A, 344-B, 345-D, 346-B, 347-C, 348-A, 349-B, 350-A, 351-A, 352-D, 353-A, 354-B, 355-D, 356-B, 357-C, 358-A, 359-B, 360-A, 361-A, 362-D, 363-A, 364-B, 365-D, 366-B, 367-C, 368-A, 369-B, 370-A, 371-A, 372-D, 373-A, 374-B, 375-D, 376-B, 377-C, 378-A, 379-B, 380-A, 381-A, 382-D, 383-A, 384-B, 385-D, 386-B, 387-C, 388-A, 389-B, 390-A, 391-A, 392-D, 393-A, 394-B, 395-D, 396-B, 397-C, 398-A, 399-B, 400-A, 401-A, 402-D, 403-A, 404-B, 405-D, 406-B, 407-C, 408-A, 409-B, 410-A, 411-A, 412-D, 413-A, 414-B, 415-D, 416-B, 417-C, 418-A, 419-B, 420-A, 421-A, 422-D, 423-A, 424-B, 425-D, 426-B, 427-C, 428-A, 429-B, 430-A, 431-A, 432-D, 433-A, 434-B, 435-D, 436-B, 437-C, 438-A, 439-B, 440-A, 441-A, 442-D, 443-A, 444-B, 445-D, 446-B, 447-C, 448-A, 449-B, 450-A, 451-A, 452-D, 453-A, 454-B, 455-D, 456-B, 457-C, 458-A, 459-B, 460-A, 461-A, 462-D, 463-A, 464-B, 465-D, 466-B, 467-C, 468-A, 469-B, 470-A, 471-A, 472-D, 473-A, 474-B, 475-D, 476-B, 477-C, 478-A, 479-B, 480-A, 481-A, 482-D, 483-A, 484-B, 485-D, 486-B, 487-C, 488-A, 489-B, 490-A, 491-A, 492-D, 493-A, 494-B, 495-D, 496-B, 497-C, 498-A, 499-B, 500-A, 501-A, 502-D, 503-A, 504-B, 505-D, 506-B, 507-C, 508-A, 509-B, 510-A, 511-A, 512-D, 513-A, 514-B, 515-D, 516-B, 517-C, 518-A, 519-B, 520-A, 521-A, 522-D, 523-A, 524-B, 525-D, 526-B, 527-C, 528-A, 529-B, 530-A, 531-A, 532-D, 533-A, 534-B, 535-D, 536-B, 537-C, 538-A, 539-B, 540-A, 541-A, 542-D, 543-A, 544-B, 545-D, 546-B, 547-C, 548-A, 549-B, 550-A, 551-A, 552-D, 553-A, 554-B, 555-D, 556-B, 557-C, 558-A, 559-B, 560-A, 561-A, 562-D, 563-A, 564-B, 565-D, 566-B, 567-C, 568-A, 569-B, 570-A, 571-A, 572-D, 573-A, 574-B, 575-D, 576-B, 577-C, 578-A, 579-B, 580-A, 581-A, 582-D, 583-A, 584-B, 585-D, 586-B, 587-C, 588-A, 589-B, 590-A, 591-A, 592-D, 593-A, 594-B, 595-D, 596-B, 597-C, 598-A, 599-B, 600-A, 601-A, 602-D, 603-A, 604-B, 605-D, 606-B, 607-C, 608-A, 609-B, 610-A, 611-A, 612-D, 613-A, 614-B, 615-D, 616-B, 617-C, 618-A, 619-B, 620-A, 621-A, 622-D, 623-A, 624-B, 625-D, 626-B, 627-C, 628-A, 629-B, 630-A, 631-A, 632-D, 633-A, 634-B, 635-D, 636-B, 637-C, 638-A, 639-B, 640-A, 641-A, 642-D, 643-A, 644-B, 645-D, 646-B, 647-C, 648-A, 649-B, 650-A, 651-A, 652-D, 653-A, 654-B, 655-D, 656-B, 657-C, 658-A, 659-B, 660-A, 661-A, 662-D, 663-A, 664-B, 665-D, 666-B, 667-C, 668-A, 669-B, 670-A, 671-A, 672-D, 673-A, 674-B, 675-D, 676-B, 677-C, 678-A, 679-B, 680-A, 681-A, 682-D, 683-A, 684-B, 685-D, 686-B, 687-C, 688-A, 689-B, 690-A, 691-A, 692-D, 693-A, 694-B, 695-D, 696-B, 697-C, 698-A, 699-B, 700-A, 701-A, 702-D, 703-A, 704-B, 705-D, 706-B, 707-C, 708-A, 709-B, 710-A, 711-A, 712-D, 713-A, 714-B, 715-D, 716-B, 717-C, 718-A, 719-B, 720-A, 721-A, 722-D, 723-A, 724-B, 725-D, 726-B, 727-C, 728-A, 729-B, 730-A, 731-A, 732-D, 733-A, 734-B, 735-D, 736-B, 737-C, 738-A, 739-B, 740-A, 741-A, 742-D, 743-A, 744-B, 745-D, 746-B, 747-C, 748-A, 749-B, 750-A, 751-A, 752-D, 753-A, 754-B, 755-D, 756-B, 757-C, 758-A, 759-B, 760-A, 761-A, 762-D, 763-A, 764-B, 765-D, 766-B, 767-C, 768-A, 769-B, 770-A, 771-A, 772-D, 773-A, 774-B, 775-D, 776-B, 777-C, 778-A, 779-B, 780-A, 781-A, 782-D, 783-A, 784-B, 785-D, 786-B, 787-C, 788-A, 789-B, 790-A, 791-A, 792-D, 793-A, 794-B, 795-D, 796-B, 797-C, 798-A, 799-B, 800-A, 801-A, 802-D, 803-A, 804-B, 805-D, 806-B, 807-C, 808-A, 809-B, 810-A, 811-A, 812-D, 813-A, 814-B, 815-D, 816-B, 817-C, 818-A, 819-B, 820-A, 821-A, 822-D, 823-A, 824-B, 825-D, 826-B, 827-C, 828-A, 829-B, 830-A, 831-A, 832-D, 833-A, 834-B, 835-D, 836-B, 837-C, 838-A, 839-B, 840-A, 841-A, 842-D, 843-A, 844-B, 845-D, 846-B, 847-C, 848-A, 849-B, 850-A, 851-A, 852-D, 853-A, 854-B, 855-D, 856-B, 857-C, 858-A, 859-B, 860-A, 861-A, 862-D, 863-A, 864-B, 865-D, 866-B, 867-C, 868-A, 869-B, 870-A, 871-A, 872-D, 873-A, 874-B, 875-D, 876-B, 877-C, 878-A, 879-B, 880-A, 881-A, 882-D, 883-A, 884-B, 885-D, 886-B, 887-C, 888-A, 889-B, 890-A, 891-A, 892-D, 893-A, 894-B, 895-D, 896-B, 897-C, 898-A, 899-B, 900-A, 901-A, 902-D, 903-A, 904-B, 905-D, 906-B, 907-C, 908-A, 909-B, 910-A, 911-A, 912-D, 913-A, 914-B, 915-D, 916-B, 917-C, 918-A, 919-B, 920-A, 921-A, 922-D, 923-A, 924-B, 925-D, 926-B, 927-C, 928-A, 929-B, 930-A, 931-A, 932-D, 933-A, 934-B, 935-D, 936-B, 937-C, 938-A, 939-B, 940-A, 941-A, 942-D, 943-A, 944-B, 945-D, 946-B, 947-C, 948-A, 949-B, 950-A, 951-A, 952-D, 953-A, 954-B, 955-D, 956-B, 957-C, 958-A, 959-B, 960-A, 961-A, 962-D, 963-A, 964-B, 965-D, 966-B, 967-C, 968-A, 969-B, 970-A, 971-A, 972-D, 973-A, 974-B, 975-D, 976-B, 977-C, 978-A, 979-B, 980-A, 981-A, 982-D, 983-A, 984-B, 985-D, 986-B, 987-C, 988-A, 989-B, 990-A, 991-A, 992-D, 993-A, 994-B, 995-D, 996-B, 997-C, 998-A, 999-B, 1000-A, 1001-A, 1002-D, 1003-A, 1004-B, 1005-D, 1006-B, 1007-C, 1008-A, 1009-B, 1010-A, 1011-A, 1012-D, 1013-A, 1014-B, 1015-D, 1016-B, 1017-C, 1018-A, 1019-B, 1020-A, 1021-A, 1022-D, 1023-A, 1024-B, 1025-D, 1026-B, 1027-C, 1028-A, 1029-B, 1030-A, 1031-A, 1032-D, 1033-A, 1034-B, 1035-D, 1036-B, 1037-C, 1038-A, 1039-B, 1040-A, 1041-A, 1042-D, 1043-A, 1044-B, 1045-D, 1046-B, 1047-C, 1048-A, 1049-B, 1050-A, 1051-A, 1052-D, 1053-A, 1054-B, 1055-D, 1056-B, 1057-C, 1058-A, 1059-B, 1060-A, 1061-A, 1062-D, 1063-A, 1064-B, 1065-D, 1066-B, 1067-C, 1068-A, 1069-B, 1070-A, 1071-A, 1072-D, 1073-A, 1074-B, 1075-D, 1076-B, 1077-C, 1078-A, 1079-B, 1080-A, 1081-A, 1082-D, 1083-A, 1084-B, 1085-D, 1086-B, 1087-C, 1088-A, 1089-B, 1090-A, 1091-A, 1092-D, 1093-A, 1094-B, 1095-D, 1096-B, 1097-C, 1098-A, 1099-B, 1100-A, 1101-A, 1102-D, 1103-A, 1104-B, 1105-D, 1106-B, 1107-C, 1108-A, 1109-B, 1110-A, 1111-A, 1112-D, 1113-A, 1114-B, 1115-D, 1116-B, 1117-C, 1118-A, 1119-B, 1120-A, 1121-A, 1122-D, 1123-A, 1124-B, 1125-D, 1126-B, 1127-C, 1128-A, 1129-B, 1130-A, 1131-A, 1132-D, 1133-A, 1134-B, 1135-D, 1136-B, 1137-C, 1138-A, 1139-B, 1140-A, 1141-A, 1142-D, 1143-A, 1144-B, 1145-D, 1146-B, 1147-C, 1148-A, 1149-B, 1150-A, 1151-A, 1152-D, 1153-A, 1154-B, 1155-D, 1156-B, 1157-C, 1158-A, 1159-B, 1160-A, 1161-A, 1162-D, 1163-A, 1164-B, 1165-D, 1166-B, 1167-C, 1168-A, 1169-B, 1170-A, 1171-A, 1172-D, 1173-A, 1174-B, 1175-D, 1176-B, 1177-C, 1178-A, 1179-B, 1180-A, 1181-A, 1182-D, 1183-A, 1184-B, 1185-D, 1186-B, 1187-C, 1188-A, 1189-B, 1190-A, 1191-A, 1192-D, 1193-A, 1194-B, 1195-D, 1196-B, 1197-C, 1198-A, 1199-B, 1200-A, 1201-A, 1202-D, 1203-A, 1204-B, 1205-D, 1206-B, 1207-C, 1208-A, 1209-B, 1210-A, 1211-A, 1212-D, 1213-A, 1214-B, 1215-D, 1216-B, 1217-C, 1218-A, 1219-B, 1220-A, 1221-A, 1222-D, 1223-A, 1224-B, 1225-D, 1226-B, 1227-C, 1228-A, 1229-B, 1230-A, 1231-A, 1232-D, 1233-A, 1234-B, 1235-D, 1236-B, 1237-C, 1238-A, 1239-B, 1240-A, 1241-A, 1242-D, 1243-A, 1244-B, 1245-D, 1246-B, 1247-C, 1248-A, 1249-B, 1250-A, 1251-A, 1252-D, 1253-A, 1254-B, 1255-D, 1256-B, 1257-C, 1258-A, 1259-B, 1260-A, 1261-A, 1262-D, 1263-A, 1264-B, 1265-D, 1266-B, 1267-C, 1268-A, 1269-B, 1270-A, 1271-A, 1272-D, 1273-A, 1274-B, 1275-D, 1276-B, 1277-C, 1278-A, 1279-B, 1280-A, 1281-A, 1282-D, 1283-A, 1284-B, 1285-D, 1286-B, 1287-C, 1288-A, 1289-B, 1290-A, 1291-A, 1292-D, 1293-A, 1294-B, 1295-D, 1296-B, 1297-C, 1298-A, 1299-B, 1300-A, 1301-A, 1302-D, 1303-A, 1304-B, 1305-D, 1306-B, 1307-C, 1308-A, 1309-B, 1310-A, 1311-A, 1312-D, 1313-A, 1314-B, 1315-D, 1316-B, 1317-C, 1318-A, 1319-B, 1320-A, 1321-A, 1322-D, 1323-A, 1324-B, 1325-D, 1326-B, 1327-C, 1328-A, 1329-B, 1330-A, 1331-A, 1332-D, 1333-A, 1334-B, 1335-D, 1336-B, 1337-C, 1338-A, 1339-B, 1340-A, 1341-A, 1342-D, 1343-A, 1344-B, 1345-D, 1346-B, 1347-C, 1348-A, 1349-B, 1350-A, 1351-A, 1352-D, 1353-A, 1354-B, 1355-D, 1356-B, 1357-C, 1358-A, 1359-B, 1360-A, 1361-A, 1362-D, 1363-A, 1364-B, 1365-D, 1366-B, 1367-C, 1368-A, 1369-B, 1370-A, 1371-A, 1372-D, 1373-A, 1374-B, 1375-D, 1376-B, 1377-C, 1378-A, 1379-B, 1380-A, 1381-A, 1382-D, 1383-A, 1384-B, 1385-D, 1386-B, 1387-C, 1388-A, 1389-B, 1390-A, 1391-A, 1392-D, 1393-A, 1394-B, 1395-D, 1396-B, 1397-C, 1398-A, 1399-B, 1400-A, 1401-A, 1402-D, 1403-A, 1404-B, 1405-D, 1406-B, 1407-C, 1408-A, 1409-B, 1410-A, 1411-A, 1412-D, 1413-A, 1414-B, 1415-D, 1416-B, 1417-C, 1418-A, 1419-B, 1420-A, 1421-A, 1422-D, 1423-A, 1424-B, 1425-D, 1426-B, 1427-C, 1428-A, 1429-B, 1430-A, 1431-A, 1432-D, 1433-A, 1434-B, 1435-D, 1436-B, 1437-C, 1438-A, 1439-B, 1440-A, 1441-A, 1442-D, 1443-A, 1444-B, 1445-D, 1446-B, 1447-C, 1448-A, 1449-B, 1450-A, 1451-A, 1452-D, 1453-A, 1454-B, 1455-D, 1456-B, 1457-C, 1458-A, 1459-B, 1460-A, 1461-A, 1462-D, 1463-A, 1464-B, 1465-D, 1466-B, 1467-C, 1468-A, 1469-B, 1470-A, 1471-A, 1472-D, 1473-A, 1474-B, 1475-D, 1476-B, 1477-C, 1478-A, 1479-B, 1480-A, 1481-A, 1482-D, 1483-A, 1484-B, 1485-D, 1486-B, 1487-C, 1488-A, 1489-B, 1490-A, 1491-A, 1492-D, 1493-A, 1494-B, 1495-D, 1496-B, 1497-C, 1498-A, 1499-B, 1500-A, 1501-A, 1502-D, 1503-A, 1504-B, 1505-D, 1506-B, 1507-C, 1508-A, 1509-B, 1510-A, 1511-A, 1512-D, 1513-A, 1514-B, 1515-D, 1516-B, 1517-C, 1518-A, 1519-B, 1520-A, 1521-A, 1522-D, 1523-A, 1524-B, 1525-D, 1526-B, 1527-C, 1528-A, 1529-B, 1530-A, 1531-A, 1532-D, 1533-A, 1534-B, 1535-D, 1536-B, 1537-C, 1538-A, 1539-B, 1540-A, 1541-A, 1542-D, 1543-A, 1544-B, 1545-D, 1546-B, 1547-C, 1548-A, 1549-B, 1550-A, 1551-A, 1552-D, 1553-A, 1554-B, 1555-D, 1556-B, 1557-C, 1558-A, 1559-B, 1560-A, 1561-A, 1562-D, 1563-A, 1564-B, 1565-D, 1566-B, 1567-C, 1568-A, 1569-B, 1570-A, 1571-A, 1572-D, 1573-A, 1574-B, 1575-D, 1576-B, 1577-C, 1578-A, 1579-B, 1580-A, 1581-A, 1582-D, 1583-A, 1584-B, 1585-D, 1586-B, 1587-C, 1588-A, 1589-B, 1590-A, 1591-A, 1592-D, 1593-A, 1594-B, 1595-D, 1596-B, 1597-C, 1598-A, 1599-B, 1600-A, 1601-A, 1602-D, 1603-A, 1604-B, 1605-D, 1606-B, 1607-C, 1608-A, 1609-B, 1610-A, 1611-A, 1612-D, 1613-A, 1614-B, 1615-D, 1616-B, 1617-C, 1618-A, 1619-B, 1620-A, 1621-A, 1622-D, 1623-A, 1624-B, 1625-D, 1626-B, 1627-C, 1628-A, 1629-B, 1630-A, 1631-A, 1632-D, 1633-A, 1634-B, 1635-D, 1636-B, 1637-C, 1638-A, 1639-B, 1640-A, 1641-A, 1642-D, 1643-A, 1644-B, 1645-D, 1646-B, 1647-C, 1648-A, 1649-B, 1650-A, 1651-A, 1652-D, 1653-A, 1654-B, 1655-D, 1656-B, 1657-C, 1658-A, 1659-B, 1660-A, 1661-A, 1662-D, 1663-A, 1664-B, 1665-D, 1666-B, 1667-C, 1668-A, 1669-B, 1670-A, 1671-A, 1672-D, 1673-A, 1674-B, 1675-D, 1676-B, 1677-C, 1678-A, 1679-B, 1680-A, 1681-A, 1682-D, 1683-A, 1684-B, 1685-D, 1686-B, 1687-C, 1688-A, 1689-B, 1690-A, 1691-A, 1692-D, 1693-A, 1694-B, 1695-D, 1696-B, 1697-C, 1698-A, 1699-B, 1700-A, 1701-A, 1702-D, 1703-A, 1704-B, 1705-D, 1706-B, 1707-C, 1708-A, 1709-B, 1710-A, 1711-A, 1712-D, 1713-A, 1714-B, 1715-D, 1716-B, 1717-C, 1718-A, 1719-B, 1720-A, 1721-A, 1722-D, 1723-A, 1724-B, 1725-D, 1726-B, 1727-C, 1728-A, 1729-B, 1730-A, 1731-A, 1732-D, 1733-A, 1734-B, 1735-D, 1736-B, 1737-C, 1738-A, 1739-B, 1740-A, 1741-A, 1742-D, 1743-A,

All trademarks owned by Lakeside Equipment Corporation.
© 2024 Lakeside Equipment Corporation.



WE TAILOR OUR SCREENING EQUIPMENT TO FIT YOUR NEEDS.

All wastewater treatment plants are not alike. That's why plant designers prefer our *Raptor*® line of screening products, the innovative all-in-one units that screen, wash, convey and dewater screenings efficiently, capturing more fine solids and long fibers than other available screens. *Raptor*® products are adaptable to a wide range of configurations, giving you more choices for better performance in your unique application. They are preferred among plant operators for their simple operation, ease of use, and minimal maintenance. When performance counts, count on the industry leader for more than 90 years—Lakeside Equipment Corporation.

REPRESENTED LOCALLY BY:



Goble Sampson Associates
3500 South Main Street, Ste. 200
Salt Lake City, UT 84115
Office: 801-268-8790



Cleaner Water for a Brighter Future®

Speak to one of our experts at **630.837.5640**, email us at **sales@lakeside-equipment.com** or visit **lakeside-equipment.com** for more product information.




Raptor® Screening Products

- Fine Screen
- Micro Strainer
- Rotating Drum Screen
- Septage Acceptance Plant
- Septage Complete Plant
- Complete Plant
- Multi-Rake Bar Screen
- FalconRake® Bar Screen
- Rotary Strainer Screen
- Wash Press

Maintenance Quiz

By James Magill

1. **Which type of bearing is specifically designed to support axial loads?**
 - A. Journal bearings
 - B. Split bearings
 - C. Solid bearings
 - D. Thrust bearings
2. **Which of the following are types of planned collections system maintenance?**
 - A. Predictive and preventive
 - B. Corrective and emergency
 - C. Deferred and redundant
 - D. Scheduled repair and emergency
3. **The best source to determine necessary personal protective gear for working with a chemical is _____.**
 - A. Safety Data Sheet (SDS)
 - B. Container label
 - C. EPA
 - D. To consult other workers with previous experience
4. **When using a micrometer, the part of the micrometer that you grip and turn to adjust the micrometer is called the _____.**
 - A. Anvil
 - B. Spindle
 - C. Sleeve
 - D. Thimble
5. **Positive-displacement air compressors can be categorized into two types: _____.**
 - A. Reciprocating and gear
 - B. Reciprocating and lobe
 - C. Reciprocating and rotary
 - D. Reciprocating and dynamic
6. **Sealing or grouting of lines is used to correct what condition?**
 - A. Exfiltration through cracks
 - B. Infiltration where large sections of pipe are missed
 - C. Infiltration through joints
 - D. Problems that cannot be televised
7. **A diaphragm pump is a type of _____?**
 - A. Dynamic feed pump
 - B. Centrifugal pump
 - C. Rotary pump
 - D. Positive displacement pump
8. **The area on a centrifugal pump that holds the packing is called _____?**
 - A. Packing gland
 - B. Packing box
 - C. Stuffing box
 - D. Stuffing gland
9. **The motor horsepower has been calculated at 50 hp. The pump is going to run for 148 hours during the week. Power costs \$0.09439/kWh. How much will it cost for the week to run the pump?**
 - A. \$468.33
 - B. \$521.07
 - C. \$256.48
 - D. \$603.03
10. **A tank is 45 feet in diameter with a 20-foot sidewall measurement. The water level is 18 feet. There is a gauge at the bottom of the tank. What psi does the gauge read?**
 - A. 8.7 psi
 - B. 11 psi
 - C. 15.6 psi
 - D. 7.8 psi
11. **Why is blower discharge piping typically insulated?**
 - A. More secure to climb on
 - B. To protect the operator from burns
 - C. Operators like shiny stuff
 - D. Gives the insulators work to do
12. **Which of the following can cause overheating of mechanical equipment _____?**
 - A. Water hammer
 - B. Over greasing
 - C. Under greasing
 - D. Dried out packing
13. **Safety features such as limit switches and shear pins are used on clarifier drives to _____.**
 - A. Guard against unauthorized personnel operating the equipment
 - B. Automatically shut down the equipment when high torque conditions occur
 - C. Control the incoming wastewater level to avoid flooding
 - D. Quickly take the clarifier off line for preventive or emergency maintenance
14. **Dual-element cartridge fuses are designed mainly for _____.**
 - A. High-voltage installations
 - B. Home-lighting circuits
 - C. Motor-circuit protection
 - D. Supplementary protection
15. **The type of gear referred to as the basic gear, which has straight teeth that are parallel to the bore center line, is called _____.**
 - A. A bevel gear
 - B. A single helical gear
 - C. A herringbone gear
 - D. A spur gear 

Answers

1-D, 2-A, 3-A, 4-D, 5-C, 6-C, 7-D, 8-C, 9-B, 10-D, 11-B, 12-B, 13-B, 14-C, 15-D.

Operations Quiz

1. In activated sludge process, microorganisms convert matter to _____.
 - A. New cells, carbon dioxide, and water
 - B. New cells, ammonia, and water
 - C. Carbon dioxide, water, and nitrate
 - D. Carbon dioxide, water, and chlorine
2. A special device that is used for sampling when foam covers the entire surface of the biological reactor is called a _____.
 - A. Bomb sampler
 - B. Depth of foam sampler
 - C. Mixed liquor sampler
 - D. Surface sampler
3. If 33 pounds of a chemical is added to 148 pounds of water, what is the percentage strength by weight?
 - A. 20.00%
 - B. 17.90%
 - C. 22.30%
 - D. 18.20%
4. Coliform bacteria are _____.
 - A. Pathogens that cause hepatitis
 - B. More resistant to chlorination than pathogenic bacteria
 - C. Pathogens that cause typhoid
 - D. Less resistant to chlorination than pathogenic bacteria
5. Which of these systems are typically used for sludge removal in rectangular clarifiers?
 - A. Draw tubes and siphons
 - B. Rapid sludge removal mechanism and vacuum tubes
 - C. Spiral blade and segmented rake
 - D. Traveling bridge and continuous flight
6. The surface overflow rate for a settling tank is determined from the _____.
 - A. Volumetric flow divided by the tank surface area
 - B. Sum of the volumetric flow and surface area
 - C. Volumetric flow divided by the tank volume
 - D. Product of the volumetric flow and the surface area
7. Typically, the largest source of pollutants for natural bodies of water is _____.
 - A. Hospital waste
 - B. Non-point
 - C. Domestic wastewater
 - D. Food-processing
8. Which of the following chemicals is used to correct a nutrient deficiency _____.
 - A. Ammonia
 - B. Sodium hydroxide
 - C. Chlorine
 - D. Lime
9. 250 mL of a 3N NaOH is diluted to 1000 mL. What is the new normality of the solution?
 - A. .75N
 - B. .25N
 - C. .50N
 - D. 1N
10. Chemical scrubbing solutions include _____.
 - A. Chlorine dioxide
 - B. Potassium permanganate
 - C. Hydrogen peroxide
 - D. All the above
11. To prevent biological and chemical alteration of samples, _____ is required.
 - A. Proper sample preservation
 - B. Refrigeration to reduce biological activity
 - C. Regular cleaning of sampling devices
 - D. All the above
12. In nitrification, the first step is oxidizing ammonia-nitrogen to nitrite-nitrogen via _____ bacteria.
 - A. Nitrosomonas
 - B. Nitrobacter
 - C. Nocardia
 - D. Acinetobacter
13. In 5 minutes, a chemical pump delivers 720 mL of polymer. The polymer solution is 1.3% solution by weight. Determine the feed rate in lbs/day of polymer. Assume the press runs for 24 hours.
 - A. 22 lbs/day
 - B. 11 lbs/day
 - C. 6 lbs/day
 - D. 3 lbs/day
14. Carbonaceous BOD and _____ make up the total oxygen demand for the nitrifying activated sludge process.
 - A. TSS
 - B. Ammonia
 - C. Nitrogenous BOD
 - D. Total residual chlorine
15. The desired solids loading rate for an 80 ft diameter clarifier is 40 lbs/day/sq ft. If the flow to the clarifier is 6.5 MGD, what is the required MLSS concentration?
 - A. 4615 mg/L
 - B. 3920 mg/L
 - C. 3517 mg/L
 - D. 3707 mg/L D1

Answers

1-A, 2-A, 3-D, 4-B, 5-D, 6-A, 7-B, 8-A, 9-A, 10-D, 11-D, 12-A, 13-C, 14-C, 15-D.



The Original Screw Impeller Pump Since 1955



Pumping Solutions for Solids and Sludge Handling

www.HidrostatPumps.com

Proudly represented by:



WWW.DSESLC.COM . 2441 South 3850 West . West Valley City, Utah . 84120 . 801-977-9200

Ops Challenge Competition

Another fantastic year of competition unfolded, featuring eight teams from Utah – six teams in the north and two in the south. We are proud to welcome the St. George Regional Water Reclamation Facility, Ash Creek Special Service District, and the Young Professionals team to this year's event.

This year's competition was exciting to watch. In addition to the camaraderie among the teams, we also saw significant involvement of family members cheering on their loved ones. We would like to thank all the teams and judges for their assistance in setting up and tearing down the equipment, recognizing this makes for a long day.

The teams started practicing in January; each team allocated a total of 11 practices with the equipment. Throughout these sessions, teams dedicated extensive time to practice and learn as much as possible until the competition arrived.

This year, we introduced a new change in the collections event by incorporating Victaulic Piping, instead of the Auto Sampler, where

competitors had to build a Vic Tower. The challenge starts with an 8" pipe, goes to an 8" to a 4" reducer, then must add three spools, check the valve, valve, and a 90-degree elbow on top. Additionally, there were minor adjustments made to the Lab event.

This year brought a fresh new twist as the cut tables were made available for anyone to attempt pipe cutting with a saw. It was a highly enjoyable experience with a fantastic turnout. Two competitions were held: the first one was for those who have never completed, and the second was for those who had competed. Heath from Ash Creek Special Service District won the competition for a new competitor.

I would like to congratulate all the teams for their outstanding performance and hard work, which truly increases the enjoyment of these events for everyone involved. I would also like to thank all the entities, managers, and board members for supporting all our competitors throughout the seasons. [DRI](#)

Operator Spotlight: Mario Campos

By Nathan Cloward



This quarter, I have been given the chance to spotlight Mario Campos. Mario based in Hurricane, UT, has been working at Ash Creek Special Service District for six years as a collections operator. His duties at Ash Creek consist of operating a jet truck, CCTV, sewer inspections, and continual system evaluations utilizing the SL-RAT. He is part of a four-person crew. Mario has a Grade III Collections certification, flagger certification, and a National Association of Sewer Service Companies (NASSCO) certification. He has applied to attend Brigham Young University (BYU) and seeks to attain a degree in business.

Mario is the only person that I have personally met who is from Guatemala – cool! Spanish is his first language, and he has lived in

Utah for seven years. Previously, he served a mission for two years in Nicaragua, where he met his wonderful wife. Together they have two children: a five-year-old daughter and a one-year-old son.

Mario had the opportunity to compete in the Ops Challenge for the first time this year. He showed a great competitive attitude and sportsmanship that exemplified the convictions of an outstanding member of our group. He enjoys his work at Ash Creek and makes good use of his free time, focusing on studying, preparing for college, and continually improving his English. He seeks to advance his career and become a better leader. He also likes to spend time outdoors and ride dirt bikes with his good friends.

I am grateful for my opportunity to connect with Mario and get to know more about him. I am excited to see where his career takes him, and due to his dedication, experience, and involvement, we are certain to see more of him in the years to come. [DRI](#)

Bringing you the best manufacturers in the industry



Wastewater &
Water Treatment
Specialists



For a full line card scan the QR code

720-450-2523

www.ambienteh2o.com

Harnessing the Power of Connection

By Katie Reams

As the world has emerged from the historic global pandemic, we all witnessed a shift in workforce dynamics. The way we work and our priorities towards our relationship with work has changed, especially amongst our Young Professionals. While surveying the changes in our modern workplace, one word has emerged as a key toward guiding professionals towards success: Connection. Selected as the 2024 WEAU Young Professional (YP) Word of the Year, 'connection' embodies the essence of building meaningful relationships within our clean water industry.

While the importance of connection may seem obvious, there are many factors that hinder us from forming connections in the workplace. Between the rise in hybrid and remote work, the generational gap amongst workers, a shrinking supply of job-seekers, and high employee turnover; building connection in our workforce has never been more difficult.

Despite these challenges, the importance of connection in our workforce cannot be overstated. Connection in the clean water industry provides the opportunity to learn about the people who are passionate about cleaning Utah's water; whether they are regulators, operators, manufacturers, engineers, administrators, or one of WEAU's many volunteers. Connection allows us to do our part in this collaborative industry better.

Both WEF and WEAU's mission is to connect water professionals; enrich the expertise of water professionals; increase the awareness of the impact and value of water; and provide a platform for water sector innovation by aiming to provide water quality professionals with the latest in water quality education, training, and business opportunities.

Connection within WEAU will help members gain the most benefit from the talents provided within the organization. By understanding the aspirations and capabilities of its members, WEAU leaders can then provide the programs and opportunities best fit for the growth and development of Utah's clean water professionals.

This year, the YPs are urging members of WEAU to prioritize connection and to share their water stories. By fostering connections and sharing experiences, WEAU members can create a stronger, more cohesive community dedicated to preserving and protecting our most precious resource: water.

Connection is not just a word; it is a powerful tool that can transform our industry and our local communities. By overcoming the barriers that hinder connection and embracing its benefits,

we can unlock the full potential of our clean water industry and create a more inclusive, collaborative and successful water future for all. [DRI](#)

Harnessing the Power of the YP

By Lauren Schmidt

The 2024 WEAU Annual Conference in St. George was an absolute whirlwind of a week. From competing in the Operations Challenge, to coordinating and leading YP events to giving two presentations – Harnessing the Power of the YP and Harnessing the Power of Connection – with my YP Co-Chair Katie Reams, it was a week to remember. Getting involved in your local professional organization such as WEAU is incredibly rewarding. One of my favorite parts of serving as the WEAU YP Co-Chair is connecting with my fellow YPs, finding my advocates in this industry, and growing in our professional careers together. At the conference this year, I competed in the Operations Challenge with four of my fellow WEAU Young Professionals (Michael Callison, Josh Matson, Meagan O'Hare, EIT, Nate Rogers), comprising the YP Team. The Operations Challenge competition is a showcase of excellence in wastewater treatment, where skilled teams of professionals compete in a series of five timed events. These events simulate real-world challenges faced in the operation and maintenance of wastewater treatment facilities. Teams within WEAU practice the five events between January and April, leading up to Annual Conference. I want to thank the PWO Committee for welcoming a YP team into this year's competition and for all the encouragement and moral support from the other teams throughout practices and at the conference.

I am a proud Team Captain, as our YP team placed 2nd in the Process Control event in our first year of competing!



While none of us YPs are operators, by competing, we gained a greater understanding of the critical role our professional wastewater operators have in our industry. I encourage all WEAU members and YPs to consider participating in the Operations Challenge at the future annual conference. The team building, industry connections, and knowledge about the operations world that I gained from participating in the challenge is invaluable. As engineers and contractors, we can design and build the most sophisticated, creative, and best wastewater treatment plants, but without operators to run them, what is the point? [DRI](#)



2024 WEAU SUMMER PICNIC

FRIDAY, SEPTEMBER 6th
vs. SACRAMENTO RIVER CATS

GATES OPEN AT 5:35 PM; FIRST PITCH AT 6:35 PM

SALT LAKE BEES

Come on down to the ballpark to enjoy a picnic & summer baseball game with our group!

SAVE THE DATE



Water
Wastewater
Water Resources
Natural Resources
Civil Engineering
Electrical Engineering
Structural Engineering
SCADA
Studies/Master Planning
GIS Mapping
Construction Management
Environmental



SALT LAKE CITY
(801) 495-2224

OGDEN
(801) 495-2224

ST. GEORGE
(435) 656-3299

BOISE
(208) 939-9561

WWW.BOWENCOLLINS.COM



INTEGRITY INSPECTION SOLUTIONS, INC.



At Integrity Inspection Solutions we believe it is best to do everything with Integrity and the highest ethical standards. Locally owned and operated, we are dedicated to providing the best solutions to private firms and municipalities in Idaho and surrounding states.

Services offered:

- CCTV Inspection (NASSCO Certified)
- Lateral Launch Inspection
- Hydro Cleaning
- Root Cutting
- Hydro Excavation
- CIPP Point Repair
- Infiltration Repair
- Manhole Coatings

Discover the Integrity Advantage:

UV CIPP Installation: Seamlessly repair and strengthen pipelines with cutting-edge UV Cured-In-Place Pipe technology.

Schwalm Robotics: Precision robotic cutting to remove obstacles, ensuring optimal pipeline performance.

Contact us:

(208) 442-4470 – Office

(208) 960-2883 – Richard Mason, President

24/7 Emergency Line:

(208) 960-2729 – Keysha Hadley, Director of Operations and Project Management

John Raymond, Outside Sales: 208-941-1733

Email: integrity@iispipeline.com



www.iispipeline.com

2024 WEAU ANNUAL CONFERENCE SUMMARY

April 23-26, 2024

WELCOME TO OUR NEW 2024-2025 WEAU BOARD

President	Chad Burrell
Vice President	Gary Vance
President-Elect	Steve Myers
Past President	Sherry Sheffield
Treasurer	Randy Zollinger
WEF Delegate	Clint Rogers
WEF Delegate	Jeff Beckman
WEF Delegate (Starting October 2024)	Sarah Ward
PWO Representative	James Magill
PWO-Elect	Taylor Byrum
Director	Brandon Wyatt
Director	Marlo Davis
Director	Tiffini Adams
Director	Matt Wiest
Director	Nate Cloward

LEADERSHIP TRANSITION



Outgoing President Sherry Sheffield addresses conference at final banquet.

OTHER HIGHLIGHTS:

Incoming President Chad Burrell addressed the conference at final banquet.

Myron Bachman was recognized for his service as WEAU Treasurer.

Jeff Beckman was recognized for his service as WEAU WEF Delegate.

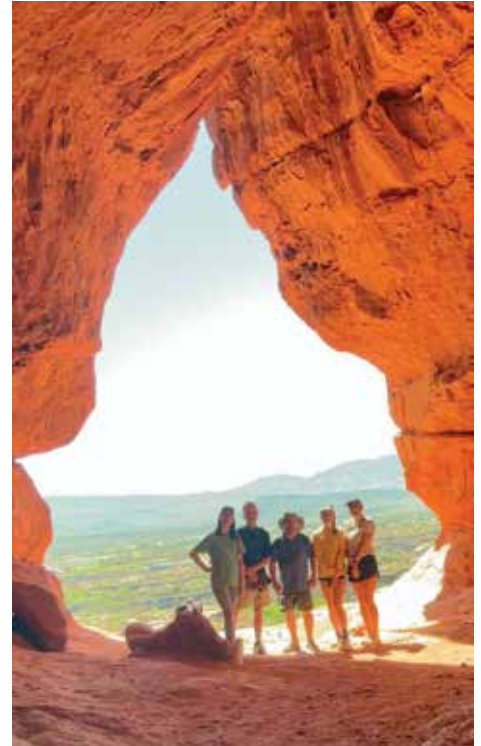
Rob Jaterka was recognized for his service as WEAU Board Director.

2024 WEAU ANNUAL CONFERENCE SUMMARY

CONFERENCE ACTIVITIES



WEAU YOUNG PROFESSIONALS/RMNASTT BIKE AND HIKE ACTIVITY



LEADERSHIP TRAINING CLASS



GOLF TOURNAMENT RESULTS

TEAM WINNERS

1st PLACE

Mark Jepps
Jordan Gardner
Eric Sahm
Justin Logan

2nd PLACE

Drew Geiger
Kasey Chesnut
Brian Short
Scott Rackman

3rd PLACE

Dallas Henline
Trevor Andra
Paul Mora
Clint Rogers

INDIVIDUAL WINNERS

LONG DRIVE

Joey Willardson	Point No. 6 – Men's
Angelia Duke	Point No. 6 – Women's
Dustyn Shaffer	Black Rock No. 6 – Men's
Jarolen Brough	Black Rock No. 6 – Women's



Drew Geiger presents Golf Tournament winners.

CLOSEST TO THE HOLE

Larry Rutherford	Point No. 3
Declan Brown	Black Rock No. 3

PIPE CUTTING COMPETITION



TWIN "D" Inc.



Layton, Utah

- | | |
|-----------------------|------------------------------|
| CCTV VIDEO INSPECTION | LATERAL LAUNCH / LOCATING |
| HYDRO EXCAVATING | AIR/DEFLECTION TESTING |
| LINING POINT REPAIRS | SCHWALM ROBOT CUTTING |
| ACOUSTIC TESTING | PIPE CLEANING |
| TAP CUTTING | VACUUMING |
| ROOT REMOVAL | ROTATIONAL MAINTENANCE PLANS |

801-771-3038
www.twind.net



GO ABOVE.



Wet Well Mounted Pump Stations



Go Above the Wet Well with the #1 Pump Station for O&M Ease and Safety, Pump Longevity, and Lowest Life-Cycle Costs

See How to Easily Switch from Submersibles!

Eliminate Confined Space Hassles Forever!



Represented in Utah by:



801-463-9900
jeff.waterford@gmail.com



Smith & Loveless Inc.



Seeing the world from YOUR PERSPECTIVE

“I’ve been in your shoes and I’ve worn the regulatory hat. I understand the things that keep you up at night. You deserve a resource in your corner that truly understands your organization and where the industry is going, and who can help you navigate both the deep and shallow waters.”

Marie Owens, PE, AE2S Engineer



Water Engineering and Beyond

Award-Winning Best Place to Work

OPERATIONS CHALLENGE

TEAMS



Ash Creek Special Service District



Central Valley Water Reclamation Facility



Central Weber Sewer Improvement District



North Davis Sewer District



Snyderville Basin Water Reclamation District



South Valley Water Reclamation Facility



St. George City



Young Professionals

2024 WEAU ANNUAL CONFERENCE SUMMARY

OPERATIONS CHALLENGE RESULTS

COLLECTIONS CHALLENGE



1st Place
Central Valley Water Reclamation Facility



2nd Place (Tie)
South Valley Water Reclamation Facility



2nd Place (Tie)
Snyderville Basin Water Reclamation District

LABORATORY CHALLENGE



1st Place
Central Valley Water Reclamation Facility



2nd Place
South Valley Water Reclamation Facility



3rd Place
Central Weber Sewer Improvement District

MAINTENANCE CHALLENGE



1st Place
Central Valley Water Reclamation Facility



2nd Place
South Valley Water Reclamation Facility



3rd Place
North Davis Sewer District

SAFETY CHALLENGE



1st Place
Central Weber Sewer Improvement District



2nd Place
South Valley Water Reclamation Facility



3rd Place
North Davis Sewer District

OPERATIONS CHALLENGE RESULTS

PROCESS CHALLENGE



1st Place
Central Valley Water Reclamation Facility



2nd Place
Young Professionals



3rd Place
South Valley Water Reclamation Facility

OVERALL OPS CHALLENGE WINNERS



1st Place
Central Valley Water Reclamation Facility



2nd Place
South Valley Water Reclamation Facility



3rd Place
Central Weber Sewer Improvement District

SPORTSMANSHIP



North Davis Sewer District



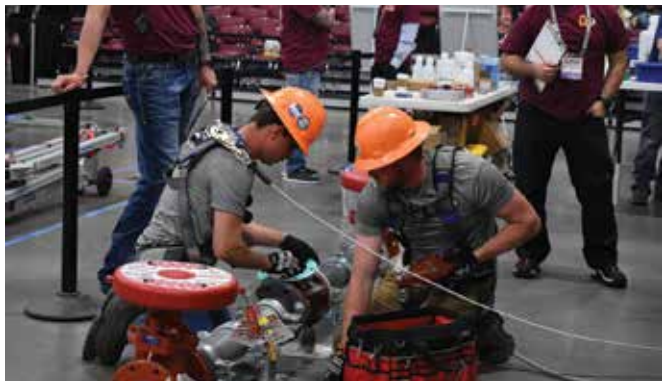
Ops Challenge Chair Austin Peterson presents ops challenge winners

Congratulations to all Winners!

2024 WEAU

ANNUAL CONFERENCE SUMMARY

THE OPERATIONS COMPETITION IN PHOTOS



This Year, the Ops Challenge Was a Family Affair



THE OPERATIONS COMPETITION IN PHOTOS



Thank you to all Ops Challenge Teams and Judges for your hard work!



2024 WEAU ANNUAL CONFERENCE SUMMARY

WEAU'S OUTSTANDING INDIVIDUAL AWARDS

OUTSTANDING COLLECTIONS OPERATOR (OVER 5 MGD)



*Dylan Thomas,
Orem City Water Reclamation Facility*

OUTSTANDING MAINTENANCE SPECIALIST



*James Magill,
Central Valley Water Reclamation Facility*

OUTSTANDING PRETREATMENT SPECIALIST



*Dustin Walton,
Snyderville Basin Water Reclamation District*

OUTSTANDING WATER RECLAMATION OPERATOR (UNDER 5 MGD)



*Colby Willoughby,
Snyderville Basin Water Reclamation District*

OUTSTANDING WATER RECLAMATION OPERATOR (OVER 5 MGD)



Brian Lamar, North Davis Sewer District

OUTSTANDING SUPERVISOR (OVER 5 MGD)



*Josh Hunsaker,
Central Valley Water Reclamation Facility*

OUTSTANDING YOUNG PROFESSIONAL



Katie Reams, J-U-B Engineers, Inc

OUTSTANDING SUPERVISOR (UNDER 5 MGD)



Gary Wilcox, Ash Creek Special Service District

OUTSTANDING LABORATORY TECHNICIAN



Paul Pope, Central Valley Water Reclamation Facility

OUTSTANDING WATER RECLAMATION FACILITY (UNDER 5 MGD)



Colton Campbell, Ash Creek Special Service District

WEAU'S OUTSTANDING PLANT AND PROGRAM AWARDS

OUTSTANDING COLLECTIONS SYSTEM (OVER 5 MGD)



Orem City Water Reclamation Facility

OUTSTANDING LAGOON SYSTEM, DISCHARGING



Morgan City Lagoon Treatment System

OUTSTANDING LAGOON SYSTEM, NON-DISCHARGING



Ash Creek Special Service District

OUTSTANDING BIOSOLIDS PROGRAM



Central Valley Water Reclamation Facility

OUTSTANDING LABORATORY



South Valley Water Reclamation Facility

OUTSTANDING PRETREATMENT PROGRAM



South Valley Water Reclamation Facility

OUTSTANDING SAFETY PROGRAM



Central Valley Water Reclamation Facility

WEAU EXCELLENCE AWARD



Ash Creek Special Service District

OUTSTANDING WATER RECLAMATION FACILITY (OVER 5 MGD)



North Davis Sewer District

OUTSTANDING WATER RECLAMATION FACILITY (UNDER 5 MGD)



Magna Water District

2024 WEAU ANNUAL CONFERENCE SUMMARY

WEF MEMBERSHIP ASSOCIATION AWARDS

WEF QUARTER CENTURY OPERATORS CLUB



Marlo Davis, Snyderville Basin Water Reclamation District

As well as:
Michael Bradshaw, Corry King, Marty Marsing, Brent Maxwell, Timothy Munden, Brandon Rice



Diego Rosso, Member of the WEF Board of Trustees speaking at conference.



David Barnes, Central Davis Sewer District

HATFIELD AWARD



Jill Jones, Central Davis Sewer District

LAB ANALYST EXCELLENCE AWARD



Shellie Turnbow, Provo City

WEAU GRANT K. BORG EXTRAORDINARY SERVICE AWARD



Myron Bachman, North Davis Sewer District

ARTHUR SIDNEY BEDELL AWARD



Mike Chandler, Ash Creek Special Service District

BEST OPERATIONS PRESENTATION



Aimee Matthies (left), Central Davis Sewer District

SELECT SOCIETY OF SANITARY SLUDGE SHOVELERS (5S) INDUCTEES

Since 1940, the Select Society of Sanitary Sludge Shovelers (5S) has honored those who make outstanding contributions, above and beyond the call of duty.

This Year's Inductees



Nate Cloward



Josh Humsaker



Hadley Gunn



Steven Myers



Matt Weist

Honoring the 2024 5S Inductees



Chad Burrell announces the 2024 5S Inductees.



The Honor Guard Members stand by.



The 2024 5S Inductees in their regalia.



The ritualistic head plunge.

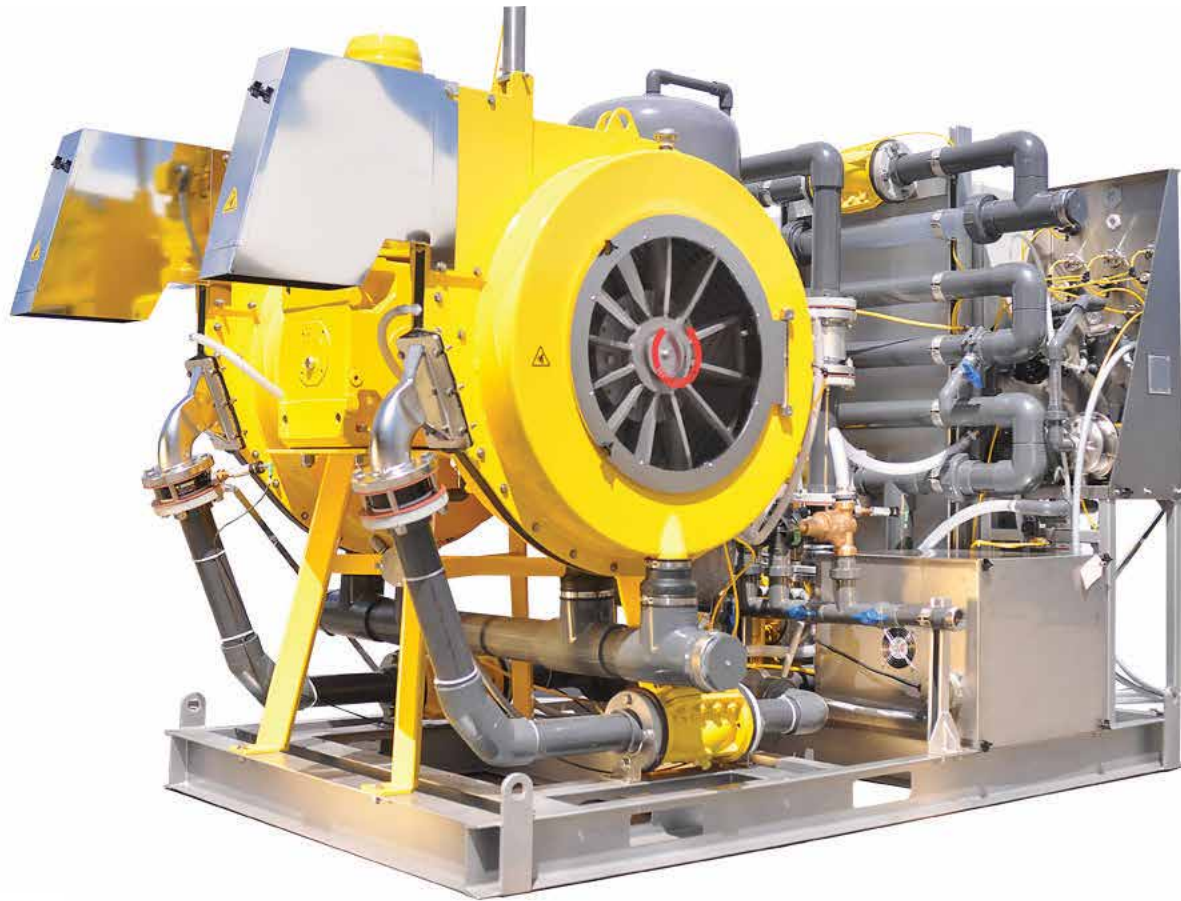


PRIME
SOLUTION



DEWATERING PERFORMANCE SIMPLIFIED

THE PRIME ROTARY FAN PRESS FAMILY



HIGH PERFORMANCE, COST EFFECTIVE ROTARY FAN PRESSES

Prime Solution designs, manufactures and services dewatering equipment. Our technology is designed and built in Michigan, in the heart of the USA.

ROTARY FAN PRESS • ROTARY FAN PRESS 2.0 • ROTARY FAN SCREW PRESS

SERVING INDUSTRIES WORLD WIDE

Proudly represented by:



Davidson Sales & Engineering

West Valley City, Utah | p. 801-823-6006 | e. info@dseslc.com | www.dseslc.com

WEAU'S ANNUAL BUSINESS MEETING



President Sheffield kicks off Business Luncheon.



Jared O'Brien presents Membership Report.



Myron Bachman presents Financial Report.



Young Professionals Committee Co-Chairs Katie Reams and Lauren Schmidt present YP Committee Report.



James Goldhart presents Biosolids Committee Report.



Shellie Turnbow presents Laboratory Committee Report.



Navneet Prasad presents Digital Water Committee Report.



Mike Chandler presents Leadership Training Committee Report.



Ryan Bench presents Student Activities Committee Report.



Mike Kobe reports on NASTT Events.

2024 WEAU ANNUAL CONFERENCE SUMMARY

WEAU'S STUDENT DESIGN TEAM HONORED AT CONFERENCE



Front (L to R): Ella Leonelli, Tamma, Bahr, Jacob Ramsey. Back: Ryan Bench (WEAU liaison), Jessica Watkins, Sterling Brinkerhoff, Donald Olsen, Sarah Miller, Jerron Stead, and Professor Austin Ball (Advisor).

THE FINAL RAFFLE



Thank You, Annual Conference Committee



Conference Committee Chair Ben Skousen (right) and Attendee Amanda Stoudt (left) pose with Vector Truck.

- Ben Skousen, Committee Chair
- Meagan O'Hare, Technical Program Chair
- Mike Chambers, Exhibitor Chair
- Korey Walsh, Website Chair
- Aimee Matthies, Social Media Chair
- Bryan Mansell, Publications Chair
- Tiffini Adams & Spencer Parkinson, Awards Committee Co-Chairs
- Tiffini Adams & Andrew Hobson, Registration
- Lauren Schmidt & Katie Reams, YP Committee Co-Chairs
- Austin Petersen, Ops Challenge Chair
- Gordan Call, Ops Challenge
- Navneet Prasad, Digital Water Committee Chair
- Mike Kobe, Sporting Clays (NASTT)
- Jeff Beckman, Golf Tournament Chair

Wastewater / Reuse ❖ Drinking Water ❖ Water Resources

We're engineering stronger communities.

FORSGREN
Associates Inc.

801.364.4785 ❖ Forsgren.com

Thank You, Annual Conference Sponsors

PLATINUM



GOLD



SILVER



2024 WEAU

ANNUAL CONFERENCE SUMMARY

SAVE THE DATES!

WEAU
MIDYEAR CONFERENCE
Utah Cultural Celebration Center in West Valley City, UT
NOVEMBER 6, 2024

WEAU
YP SUMMIT
South Valley Sewer District
NOVEMBER 5, 2024
12:00 pm (noon) to 5:00 pm
Watch for more details at www.weau.org.

2025 WEAU
ANNUAL CONFERENCE
The Dixie Convention Center in St. George, UT
APRIL 22-25, 2025



PROCESS AND ROTATING EQUIPMENT SPECIALISTS!

Proudly representing the following manufacturers!



WWW.DSESLC.COM . 2441 South 3850 West . West Valley City, Utah . 84120 . 801-977-9200



Water Environment Association of Utah 2024 Engineering Symposium

Please join us for this in-person event to learn about this year's topic: All Things Preliminary and Primary Treatment. Coffee/Breakfast and lunch will be provided. Please contact Jade Echard with any questions at (435) 671-2687 or jechard@carollo.com.

WHEN/WHERE:

- » Thursday, August 22, 2024
- » 8:00 AM to 1:00 PM
- » TBD

*AGENDA COMING SOON!

REGISTRATION

- » Sign up at WWW.WEAU.ORG
- » \$50 per WEAU member
\$75 per non-member
- » Lunch is included

RELIA SOURCE®

Total System Responsibility – What does it mean for you?



Since 1933, you've trusted Gorman-Rupp to manufacture the best-performing, most durable pumps in the industry. Easy to specify, purchase and install, ReliaSource® systems come precisely engineered and completely tested by a company that has been building complete pumping stations for over 50 years.

Carefully inspected, they carry an industry-leading warranty. And, most importantly they carry the Gorman-Rupp name - giving you the confidence that your pumping system will stay on the job so you don't have to.

VISIT US AT GRpumps.com TO SEE OUR NEWEST RELIA SOURCE PACKAGES!

DISTRIBUTED BY:

COOMBS HOPKINS COMPANY

8706 SOUTH 700 EAST | SUITE 201
SANDY, UT 84070
PH: (801) 990-3174
coombshopkins.com

GR
GORMAN-RUPP
PUMPS
GORMAN-RUPP PUMPS
P.O. BOX 1217 | MANSFIELD, OHIO 44901-1217
419.755.1011 | GRSALES@GORMANRUPP.COM
GRPUMPS.COM

**HANSEN
ALLEN
& LUCE** INC
ENGINEERS

50 YEARS
1974 - 2024

Serving your community for over 50 years



View HAL's legacy of
service to your community

Photo credit to Kearns Improvement District

HALengineers.com



Hansen, Allen & Luce Celebrates its 50th Anniversary



With Steve Jones, CEO

What started in 1974 as Vaughn Hansen Associates has grown to become Hansen, Allen & Luce (HAL), an environmental and water resources engineering firm that serves Utah and the surrounding Intermountain West. As HAL celebrates its 50th anniversary in 2024, the firm continues to meet the needs of public- and private-sector clients and their communities.

In 1987, the firm became Hansen, Allen & Luce, led by Marvin Allen, Dr. David Hansen, and Bill Luce. In 2021, Steve Jones, Gordon Jones, and Dr. Tyler Allen became the new corporate leadership. Dr. Vaughn Hansen's goal was to create a highly ethical consulting team that would help meet the growing water engineering needs of the Intermountain West. With two internal transfers of the company, the trust and core values have stayed the same.

"Vaughn always wanted to maintain a high level of expertise," says Steve Jones, HAL's CEO. "If you had a really hard problem to solve, you came to HAL, and we've kept that reputation all along the way. Today, 80% to 90% of our staff have graduate degrees, including several Ph.D.'s. We maintain our roots of having highly educated engineers who specialize in solving the more difficult problems than the everyday ones you may come across."

Since HAL's 2021 change in leadership, the firm has grown significantly, something Jones says was necessary to meet the needs of growing communities.

"We still haven't found the ceiling yet," says Jones. "We're still focused on finding

“As HAL celebrates its *50th anniversary* in 2024, the firm continues to meet the needs of public- and private-sector clients and their communities.”

top talent because we don't want to change that reputation, but at the same time we're trying to meet the demand in our community to provide these services.”

Ingrained in Dr. Hansen's philosophy was the phrase, "How can I help?," which Jones says has been a pillar of success at HAL, both for the clients and internally among employees and management to develop solutions.

HAL has always had a strong focus on the needs of the environment and cities. Currently, at a state level, an increasing focus is on rising populations with only finite amounts of water to match.


"That has been at the forefront of many of our projects: identifying what water is physically available, matching that to water rights, and then understanding what is needed for the environment and what is needed to support the growing communities, because we're all sharing the water," says Jones. "So that's very rewarding. It's become required to look broader than just one community. We can't ignore one part of the puzzle, because that will create a problem going into the future. We want to create win-win solutions for everyone."

At a city level, HAL has studied systems to treat stormwater and delay runoff with low-impact development techniques. This allows for continued development and improvement of the environment

while reducing pollution discharged to natural waterways.

"It came about as an effective, efficient way to treat stormwater because when we pave and build, and the storm hits, it washes off all that dirt and contaminants into streams, rivers, and lakes. It's a way to naturally use the process of delaying that runoff, putting it in grassy swales or letting it seep it into the ground, so that the natural process treats the water," says Jones. HAL has advocated similar innovative solutions in drinking water, irrigation, wastewater, and more, helping clients do more with less and benefitting the environment at the same time.

This spring, Jones and his team at HAL plan to celebrate accomplishments and successes with their clients at an open house. Internally, HAL is planning an evening of dinner and awards in Park City to celebrate staff members' hard work and contributions. As HAL looks to the future, the team will continue to develop and provide top-tier services to the Intermountain West area.

"It's exciting and even a little scary for the company to grow so fast because we want to keep it in control, but I think the exciting part is we are able to meet the needs of more clients and we have the opportunity to provide more rewarding careers for engineers in our area for years to come." 



*AquaNereda® Installation:
Wolcott WWTP at Wolcott, KS*

THE ONE AND ONLY. TRUE AEROBIC GRANULAR SLUDGE TECHNOLOGY

With over two decades of installed experience at more than 100 facilities worldwide, Nereda® technology is the **One and Only** true aerobic granular sludge on the market today.

Since its introduction to the U.S. and Canada in 2017, more than 40 AquaNereda® plants are currently in design, under construction or in operation throughout North America.

Consultants and end-users continue to realize the process and cost saving benefits associated with AquaNereda technology through on-site pilot testing, installation visits and technical seminars.

ADVANTAGES OF AQUANEREDA® TRUE AGS TECHNOLOGY:

- Design MLSS of 8,000 mg/l greatly reduces footprint
- Robust process that adapts to changing conditions
- Capable of enhanced nutrient removal
- Applicable for municipal and industrial waste streams
- Suitable for retrofits and greenfield sites
- Significantly less construction cost compared to conventional treatment
- Exceptional effluent without chemical addition
- Energy and chemical savings results in lowest cost of ownership



SVI₅ comparison of aerobic granular sludge (left) and conventional activated sludge (right)



AQUA-AEROBIC SYSTEMS, INC.
A Metawater Company

www.AquaNereda.com | 815.654.2501

Represented by:



Davidson Sales & Engineering
West Valley City, Utah
P 801-977-9200 | www.dseslc.com

Aqua-Aerobic Systems, Inc. is the exclusive U.S. and Canada provider of Nereda® technology developed by Royal HaskoningDHV.

In Memoriam

Mike Howell Foerster

It is with great sadness that we announce the passing of Michael Howell Foerster. He passed away peacefully in his sleep on February 21, 2024, at the age of 52. Mike was born on June 7, 1971, in Salt Lake City, UT, to Gert and Shirley Howell Foerster. He led a life marked by unwavering faith, boundless energy, and selfless service.

After graduating from Brighton High School in 1989, Mike served a mission for the Church of Jesus Christ of Latter-day Saints in Frankfurt, Germany, where he felt honored to serve in the land of his ancestral roots. He earned his degree in Civil Engineering from the University of Utah in 1996 (Go Utes!). On June 15, 1994, he married the love of his life, Anne Linford, in the Salt Lake Temple. Their love was deeply profound, evident to all who knew them.

Mike enjoyed working as the District Engineer for the South Valley Sewer District. He made significant contributions and was an active member of the Water Environment Federation (WEF) and the Water Environment Association of Utah (WEAU). From 2007-2020, he served as Committee Chair, Board Director, Vice-President, President Elect, President, Past President, and WEF Delegate. Mike also was the creator and host of Collections System Jeopardy, a continuing education class. He enjoyed his career and loved his work family. Mike was passionate about the outdoors, sharing countless adventures with the Boy Scouts from mountain tops to national and international jamborees. His commitment to the Boy Scouts of America helped many young men and Mike was honored when he received the prestigious Silver Beaver Award.

Mike's interests were diverse, from swimming and boxing to the year-round singing of Joy to the World. He had an enthusiasm for game shows like The Price Is Right, as well as a love for Saturday-morning cartoons. His creativity and spirit were evident in the family traditions he cherished, such as the annual Pie Day after Thanksgiving, and the elaborate Christmas morning games and treasure hunts.

Mike is survived by his devoted wife, Anne; children Jared (Rebekah), Mariah, Adam, Andrew, and Brooke; parents Gert and Shirley; and siblings Rebecca (Kim), Matthew (Roberta), Elizabeth (Aaron), Daniel (Travis), Stephen (Brooke), along with numerous cousins, in-laws, nephews and nieces who knew him as Favorite Uncle Mike.

In the words of his family, "Finding the right words feels almost impossible, but we aim to honor the incredible man our dad was. He was the soul of our family and a friend to everyone fortunate enough to know him. His faith in God, his ability to spread love, coupled with his unwavering support for anyone in need, truly set him apart as a devoted husband, an inspiring father, and role model. He faced life with resilience, compassion, and without complaint. He taught us to dream big." We will miss his humor, welcoming smile, and constant energy. [DN](#)

Don't Gamble with Water



39th ANNUAL
TRI-STATE SEMINAR
August 5 – 8, 2024

South Point Hotel & Casino | Las Vegas

ALL UNDER ONE ROOF

- ◆ More Than 300 Exhibitors
- ♣ 200+ Technical Sessions
- ♥ Expanded Tour Offerings and Workshops for New and Experienced Operators
- ♠ Up to 24 Contact Hours Available Over 3 Days

HOTEL RESERVATIONS

GROUP NAME:
Tri-State Seminar 2024

ROOM RATE: \$88/night
(not including taxes & fees)

DATES: August 4 - 8, 2024

GROUP CODE: TRI2024
(first 3 are letters, last 4 are numbers)

CUT-OFF DATE: 07/19/2024

REGISTRATION RATES (Per Person)

- ◆ \$99 Early Bird
- ♣ \$199 After July 19, 2024
- ♥ \$249 After August 4, 2024



Thank you,

WEAU PLATINUM SPONSORS



ARCHER WESTERN



CONSTRUCTION



Smith & Loveless Inc.

Protecting Water. Protecting People.™



PISTA®

95% Removal. Down to 75 Microns. All Flows.



WE GET GRIT

We get it. Treatment plants don't have the same grit removal goals, site plan reqs, and flow conditions. So, we innovate multiple **PISTA®** solutions like the ultra-fine **INVORSOR™** (95% removal down to 75 μ) and space-saving **PISTA® VIO™** (100 μ removal and variable inlet/outlets) and **OPTIFLOW 270™** retrofits to optimize your existing system. We don't just get grit – we get your grit.

Represented locally by: **Waterford Systems**

Phone: (801) 463-9900

Email: jeff.waterford@gmail.com

Website: waterfordsystems.com



Smith & Loveless Inc.
Protecting Water. Protecting People.™

CALL 800.898.9122
VISIT SmithandLoveless.com

Learn More



Leadership Training Workshop

WEAU is happy to host the Northern Utah and New Southern Utah Leadership Training Workshop locations. Northern Utah Workshops will be held at the South Valley Sewer District Jordan Basin Training Room. Southern Utah Workshops will be held at the Ash Creek Special Service District Board Room.

Enrollment is limited to 50 people at both locations.
Member cost per person: \$500
Non-member cost per person: \$650
Scan the QR Code for training dates and registration information.



Applications Open for the Operator and Professional Scholarships

Contact weauscholarship@weau.org with any questions and scan the code to apply.



Who is Your Mentor?

WEAU wants to recognize individuals who have impacted the wastewater field by providing professional and personal development of one or more water quality professionals, including providing personal, social, and intellectual support. Nominate your mentor for recognition at the WEAU Mid-Year conference! Nominees will receive a one-time recognition.

Scan the QR code to nominate.



STRUCTURE. & INTEGRITY.

PITTSBURGH TANK & TOWER GROUP

An ESOP Company Since 1919

"100 years and still climbing"

WWW.PTTG.COM

INSPECTIONS REPAIR TANKS

NEW TANKS
(270) 826-9000 ext. 2601

EXISTING TANKS
(270) 826-9000 ext. 4601

Driving Innovation in Municipal Wastewater



As you work to bring water full circle, Sulzer is the one to take you forward. Sulzer offers the most advanced equipment for wastewater collection and treatment, including submersible pumps, mixers, flow boosters, aeration systems and turbocompressors, along with easy-to-use systems for monitoring and control.

Our solutions provide many ways to boost reliability and curb your energy costs. With our extensive knowledge and experience, we can identify the networks and systems where they will benefit you most. And we secure those benefits not only through our equipment, but also through our long-term service and support.

For more information visit www.sulzer.com

SULZER

Proudly represented by:



DAVIDSON
SALES & ENGINEERING

2441 South 3850 West, Site 'B'
West Valley City, Utah 84120

801-977-9200

www.dseslc.com



Advertiser Product & Service Center

Digested News is made possible by the companies below who convey their important messages on our pages. We thank them for their support of WEAU and its publication and encourage you to contact them when making your purchasing decisions. To make it easier to contact these companies, we have included the page number of their advertisement, their phone number, and, where applicable, their website.

Company	Page Number	Telephone	Website
(AE2S) Advanced Engineering and Environmental Services, Inc.	24	801-331-8489	www.ae2s.com
Ambiente H2O	17	801-532-4812	www.ambienteh2o.com
Aqua-Aerobic Systems, Inc.	42	815-654-2501	www.aquanereda.com
Archer Western	3	801-534-4440	www.walshgroup.com
Bowen Collins & Associates, Inc.	19	801-495-2224	www.bowencollins.com
Brown and Caldwell	4	801-316-9800	www.browncaldwell.com
Carollo Engineers	8	800-523-5826	www.carollo.com
Coombs Hopkins Company	39	303-477-1970	www.coombshopkins.com
Davidson Sales & Engineering	16, 34, 38, 42, 48	801-977-9200	www.dseslc.com
Endress+Hauser USA	6	888-363-7377	www.us.endress.com
Forsgren Associates, Inc.	36	801-364-4785	www.forsgren.com
Goble Sampson Associates	50	801-268-8790	www.goblesampson.com
Hansen, Allen & Luce, Inc.	40-41	801-566-5599	www.hansenallenuce.com
Hidrostal	16	630-948-3355	www.hidrostalpumps.com
Integrity Inspection Solutions, Inc.	10, 20	208-442-4470	www.iispipeline.com
Lakeside Equipment Corporation	13	630-837-5640	www.lakeside-equipment.com
MGC Contractors	52	801-739-6948	www.mgccontractors.com
Mountainland Supply Company	2	801-224-6050	www.mountainlandsupply.com
Nickerson Company	8	801-973-8888	www.nicopumps.com
Pittsburg Tank & Tower Group Inc.	47	270-826-9000	www.pttg.com
Prime Solutions	34	269-694-6666	www.psirotary.com
Smith & Loveless Inc.	24	800-898-9122	www.smithandloveless.com
Sulzer	48	801-977-9200	www.sulzer.com
Sunrise Engineering Inc.	7	801-523-0100	www.sunrise-eng.com
Tri-State Seminar LLC	44	866-791-7626	www.tristateseminar.com
Twin "D" Environmental Services	23	801-771-3038	www.twind.net
Val Kotter & Sons	12	435-734-9598	www.valkotterandsons.com
Waterford Systems	46, 51	801-463-9900	www.waterfordsystems.com

GOBLE SAMPSON

Providing Water and Wastewater Solutions Since 1957

www.goblesampson.com 801-268-8790



Flow • Level • Pressure • Aeration • Screens • Grinders
 Blowers • Analyzers • Dewatering • SBR • UV Disinfection
 Grit Removal & Processing • Package Treatment Plants
 Valves & Gates • Ultra Filtration & RO • Chemical Feed
 Lift Stations • Vacuum Sewer Systems • Fe, Mn, As Removal



cleanwater1



PSI WATER TECHNOLOGIES

UGSI CHEMICAL FEED

PAX WATER TECHNOLOGIES



Trust Monster Quality



Smith & Loveless Inc.



WATERFORD SYSTEMS

waterfordsystems.com • 801 463 9900
 2850 East 3300 South, Ste. 201 • Salt Lake City, UT 84109

Employee Owned



QUALITY · PERFORMANCE · VALUE

MGC is a premier provider of Water and Wastewater general contracting services



- WATER RESERVOIRS
- WATER TREATMENT
- WASTEWATER TREATMENT
- BOOSTER PUMP STATION
- LIFT STATION
- WELL DRILLING
- ARSENIC REMOVAL
- DISINFECTION
- WATER REUSE
- ODOR CONTROL