

Up Coming Events

Nevada WEA

[Method Detection Limits Presentation](#)

Dec 7, 2020 1:00 pm

WEA of Utah

[Webinar: Wastewater Epidemiology: Using SARS-CoV-2 Genetic Material to Track COVID-19 Trends in Utah Communities](#)

Dec 9, 2020 1:00 pm – 3:00 pm

[Forum on Environmental Accreditation](#)

January 25 - 29, 2021

Virtual Event

New York

[93rd Annual Virtual Meeting](#)

Feb 9 -11 and Feb 16 – 18, 2021
Session 23: CECs 101: A Review of the Basics

Feb 18, 2021 1:30 pm

New England WEA

[Contaminants of Emerging Concern Series](#)

Webinar 1: CEC 101-What are they?

Archived webinar

From the LPC Chair

Our Annual Meeting on September 30, 2020 was a chance to celebrate the LPC's accomplishments. Some highlights include:

- Guest speakers on our full committee calls including Bill Lipps providing a Standard Methods update, Rasha Maal-Bared discussing water laboratories responses to Covid-19, and Chris Impellitteri discussing PFAS and wastewater issues.
- A "webinar library" of water lab related topics on our WEF website committee page
- Producing a webcast focused on calculating and using method detection limits. The presentation included a spreadsheet programmed with formulas used in MDL calculations.
- A WEFTEC session focused on innovations in laboratory equipment and analyses.

While we missed meeting together at WEFTEC, the virtual format of this year's meeting increased our usual attendance from under ten people to nearly forty.

As always, the LPC could not produce educational materials without our members working together. Many thanks to the Leadership Team and our WEF Staff Liaison, Beth Conway.

Mary Johnson

LPC Group Chats

One thing about working during Covid-19 — so many of us are now aware of how many on line tools communication tools are out there.

For WEFTEC 2020, the LPC had planned a mobile session focused on "Innovations in Laboratory Equipment and Analysis." This morphed into a Solutions Session which featured representatives from Hach and Xylem, as well as three laboratory professionals, discussing various analytical methods for nitrogen and phosphorus. Attendees were able to participate in conversation via Slido, a Q&A and polling platform.

For 2021, the LPC would like to expand its outreach using technology similar to that used during WEFTEC. Specifically, we are introducing a "group chat." The idea is for interested lab professionals to participate in an online discussion group focused on a particular analysis. Participants could talk about how they analyzed for a specific parameter, including some of their successes and challenges.

Stay tuned for more information. Expect the first chat will be focused on everyone's favorite analysis: Biochemical Oxygen Demand.

Virtual Operators Challenge



Bowery Bay Coyotes

On October 6 – 7th, WEF held the first (and I have to admit that I hope the last) Virtual Operations Challenge Laboratory event. The lab event was modified this year to allow two team members to compete by performing calibration and analysis of TDS samples using a YSI Xylem MultiLab Meter as well as calculate a mass balance across the treatment system to evaluate the removal efficiency of various treatment trains and other data related to solids analysis. There were three divisions that competed this year – the existing Division I and II and a new division for brand new teams. There were a total of 27 teams that competed this year with 8 brand new teams! Following are the laboratory event winners for each division:

Division 1

First Place – WEA of Texas Poseidons

Second Place – WEA of South Caroline Controlled Chaos

Third Place – Arizona Water Association Surprise Turdologists

Division 2

First Place – Virginia WEA Blue Ridge Brawlers

Second Place – North Carolina WEA WoW

Third Place – New England WEA Force Main

Division 3

First Place – WEA of Ontario Peel Wastewater Connoisseurs

Second Place – North Carolina WEA Smooth Operators 2

Third Place – North Carolina WEA Smooth Operators 1

Congratulations and thank you to the teams for all of their hard work, patience as we tried to get the cameras positioned right at the beginning of each new team, and willingness to jump in and compete this year virtually. It certainly wasn't the same as being together at WEFTEC in New Orleans, but everyone made the best of it and I hope enjoyed themselves! I also want to take a moment to thank my dedicated laboratory event judges and employers who jumped in and said they were up to the task even though we weren't exactly sure how we were going to pull off a completely virtual event: Laura St. Pierre, Reggie Morgan, Allan Clum, Ketki Sheth, Caitlin O'Leary, Devon Morgan, Mary Dressel, Paul Reese, Al Robdrup, Roy Zimmerman, Keith Richard, Rhonda Harris, Rich Weigand and Kristie Yeakle. We could not have done this without all of the volunteers!

I encourage you to get involved in Operations Challenge either at your member association competition or at WEFTEC. If you'd like to volunteer to be a judge next year, please feel free to contact me, Kim Riddell-Furry, at kim.riddell@alloway.com.



Controlle Chaos



Great Danes



Blue Ridge Brawlers

Article by Kim Riddle

Spotlight: Garland Water Utility Laboratory

1. What is the name and location of your facility? Garland Water Utility Laboratory, 2500 E. Centerville Road, Garland, TX 75040
2. What is the average daily flow (MGD)? Duck Creek WWTP – 40 MGD, Rowlett Creek WWTP – 15 MGD
3. How many analysts and/or technicians work in the laboratory? 5 chemists and Laboratory Manager
4. What analysis do you perform? Alkalinity, Ammonia, BOD, COD, Cyanide, E. coli, Ignitability, Hardness, Metals, Nitrate, Nitrite, Oil & grease, Ortho phosphorus, pH, Semi-volatile organic compounds, Total coliform, Total dissolved solids, Total phosphorus, Total suspended solids, Volatile organic compounds, Volatile suspended solids, % solids.
5. Which are for NPDES reporting? Ammonia, BOD, E. coli, pH, TSS
6. Which are strictly for operational information? Alkalinity, Nitrate, nitrite, ortho-phosphorus, total phosphorus, TSS, VSS, % solids, TDS
7. Do you accept samples for analysis from outside sources? Yes
8. Do you have one or more contract labs you send samples to for analysis? Yes
9. What instrumentation do you use? Discrete analyzers, GC, GCMS, ICPMS, Spectrophotometer
10. Do you utilize a LIMS system? Yes
11. What sort of certification or licensure is required/encouraged for your workforce? Water/Wastewater operator certification available.
12. Are there any 'out of the box' or 'pilot' testing your lab has assisted with? Pilot testing on sludge centrifuges in 2013 and Aqua-Aerobic systems (AASI) in 2017.

Spotlight: Garland Water Utility Laboratory, Continued

13. Is there anything unusual or special about your facility or lab? (i.e. – aquarium fed by plant effluent in the building? Plant garden fertilized with plant biomass?) The effluent from wastewater treatment have for over 20 years provided a local power plant with effluent water for boiler systems. The wastewater treatment effluent water flows through a man-made, 1840-acre wetland, providing natural habitat for a wide variety of birds and reducing nitrogen and phosphorus content and is then reused by being pumped to the drinking water's reservoir.



Arti-
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Lab Quiz

Lab analysts crunch numbers as part of their daily work. Try these problems for a review of formulas and calculations routinely used in the wastewater laboratory.

- Round each of the following values to three significant figures.
 - 105.6 mg
 - 1067 mL
 - 0.575 g
- Calculate the grams of nitrogen present in 35.5 g ammonium chloride. The chemical formula for ammonium chloride is NH_4Cl . Atomic masses are: Nitrogen = 14.01, Hydrogen = 1.01, and Chlorine = 35.45
- An analyst transfers 35.5 g of ammonium chloride to a 500-mL volumetric flask and dilutes to volume with deionized water. Calculate the percent ammonium chloride in this solution.
- An analyst transfers 35.5 g of ammonium chloride to a 500-mL volumetric flask and dilutes to volume with deionized water. Calculate the concentration of ammonium chloride in this solution as mg/L.
- An analyst titrates 50 mL of a sulfuric acid solution with a 0.10 N sodium hydroxide using phenolphthalein as an indicator. If the clear to pink color change requires 24.25 mL of the sodium hydroxide titrant, what is the normality of the sulfuric acid solution?
- An analyst spikes an ammonia sample with 10.0 mg/L prior to analysis. If the ammonia concentration of the original sample is 15.2 mg/L and the ammonia concentration of the spike sample is 24.3 mg/L, what is the percent recovery of the spiking solution?
- A treatment plant influent daily composite sample has a BOD of 152 mg/L. The effluent composite sample collected on the same day has a BOD of 7 mg/L. What is the BOD percent removal through the treatment plant?
- Calculate the BOD loading in lbs/day for a 10.5 MGD treatment plant if the influent BOD is 152 mg/L and the effluent BOD is 7 mg/L.

You can find answers on page 7 of this newsletter.

Lab Quiz: Answers

- 106 mg
 - 1070 mL
 - 0.58 g
- first calculate the atomic mass of NH_4Cl

$$\begin{aligned}\text{mass NH}_4\text{Cl} &= \text{mass N} + (4 * \text{mass H}) + \text{mass Cl} \\ &= 14.01 + (4 * 1.01) + 35.45 \\ &= 53.50\end{aligned}$$

then calculate the g nitrogen present in 35.5 g NH_4Cl

$$\begin{aligned}\text{g N} &= 35.5 \text{ g NH}_4\text{Cl} * \frac{\text{g N}}{\text{g NH}_4\text{Cl}} \\ &= 35.5 \text{ g NH}_4\text{Cl} * \frac{14.01}{53.50} \\ &= 9.3 \text{ g N}\end{aligned}$$
- $$\begin{aligned}\% \text{ NH}_4\text{Cl} &= \frac{35.5 \text{ g NH}_4\text{Cl}}{500 \text{ mL water}} * \frac{1 \text{ mL water}}{1 \text{ g water}} * 100\% \\ &= 7.1\%\end{aligned}$$
- $$\begin{aligned}\text{mg/L NH}_4\text{Cl} &= \frac{35.5 \text{ g NH}_4\text{Cl}}{500 \text{ mL water}} * \frac{1000 \text{ mL}}{1 \text{ L}} * \frac{1000 \text{ mg}}{1 \text{ g}} \\ &= 71,000 \text{ mg/L}\end{aligned}$$
- Normality of acid * Volume of acid = Normality of base * Volume of base

$$\begin{aligned}\text{N H}_2\text{SO}_4 * 50 \text{ mL} &= 0.10 \text{ N NaOH} * 24.25 \text{ mL NaOH} \\ \text{N H}_2\text{SO}_4 &= 0.05 \text{ N}\end{aligned}$$
- $$\begin{aligned}\% \text{ recovery} &= \frac{\text{spiked result} - \text{sample result}}{\text{spike concentration}} * 100\% \\ &= \frac{24.3 \text{ mg/L} - 15.2 \text{ mg/L}}{10.0 \text{ mg/L}} * 100\% \\ &= 91.0\%\end{aligned}$$
- $$\begin{aligned}\% \text{ removal} &= \frac{\text{concentration in} - \text{concentration out}}{\text{concentration in}} * 100\% \\ &= \frac{152 \text{ mg/L} - 7 \text{ mg/L}}{152 \text{ mg/L}} * 100\% \\ &= 95\%\end{aligned}$$
- $$\begin{aligned}\text{Loading, lbs/day} &= \text{mg/L} * \text{MGD} * 8.32 \\ &= 152 \text{ mg/L} * 10.5 \text{ MGD} * 8.32 \\ &= 13,280\end{aligned}$$

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tal Services
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Educational Content Sharing

In an effort to share best practices, innovation and the latest information for lab analysts, the WEF Lab Practices Committee (LPC) will link to educational content that has been used (and is owned) by WEF member associations. (WEF LPC is not hosting the material but is linking to it.)

The goal of this effort is to provide a warehouse of useful webcasts, seminars, etc. that can be accessed by audiences from all over the country. We believe that there is material that just needs to be shared in order to educate larger audiences.

Please contact John Rigdon, jrigdon@gmail.com, with suggestions of webinars/workshop content that you recommend we obtain or with topics you would like to see.

Check out the [WEF website LPC page](#) to see available topics.

About the LPC

The Water Environment Federation's Laboratory Practices Committee (WEF LPC) is made up of volunteer members from academia, consulting firms, utilities, government agencies, and manufacturers.

WEF LPC develops technical products to promote general understanding of laboratory practices for water and wastewater.

Membership is open to all WEF members.

Notify Beth Conway (econway@wef.org) if you would like to be placed on a mailing list for the WEF LPC newsletter

Now on Netflix: Brave Blue World

Film Summary: The [Brave Blue World](#) documentary paints an optimistic picture of how humanity is adopting new technologies and innovations to re-think how we manage water. The film takes viewers on an incredible journey to meet with pioneers and innovators who are addressing global water and sanitation challenges. Their stories reveal a hopeful and optimistic future for our most precious resource.

