CSWEA
Webinar
Series

Tuesday – March 8, 2022

11:00 AM to 1:00 PM

Topic: SCADA, Data, & Digesters

11:00 AM **Introduction – Grace Scarim, M.S. Student, Marquette University**

11:05 AM **Does my digester need a probiotic? Relating microbiome composition to digester health**

Daniel Zitomer, Ph.D., P.E., BCEE | ***Marquette University***

Operation and design of biotechnologies such as activated sludge or anaerobic digestion rely, in part, on the knowledge of the total mass of microbes in the system doing the work. Professionals rely on measurements of total biomass such as mixed liquor volatile suspended solids to define the rate at which waste can be treated in a given system; two pounds of microbes work twice as fast as one pound. However, the exact identity and number of individual taxa in a digester are not typically used to engineer the system, and it is assumed that all microbes that use the same substrate do so at the same rate. But not all microbes have the same abilities when it comes to the rate or extend of BOD removal. In fact, the identity and number of microbes present in a digester matters in terms of process performance. Just as different people can have different microbes in their gut that influence health, different digesters can have different microbial communities that influence process performance. In this talk, molecular tools to characterize and quantify digester microbial communities will be described. Correlations between the identity/number of specific microbes in digesters and the rate of biogas production or BOD removal will be presented. Future plans to incorporate microbial community data into design and operation models will be presented. In the near future, more stable and complete anaerobic digestion of municipal sludge and industrial wastes may be possible by employing microbial community-process function relationships.

11:45 AM **It's 2:00 AM – Do You Know Where Your SCADA System Backup is?**

Mauritz Botha | **Chief Technology Officer at XiO, Inc.**

A reliance on physical equipment such as PLCs, servers and PCs makes traditional SCADA systems vulnerable to natural disasters and time consuming to fully restore operability from backups. Cloud-based SCADA systems combine remote sensors and cellular communications with the robust power of cloud computing services. Cloud-based SCADA systems operate independent of physical equipment in an office and allow agency staff the ability to monitor and control operations from any web-enabled device, regardless of location. Systems are fault tolerant and resilient. Despite disruptions in internet connectivity, cloud-based SCADA systems provide full local control and continuous operations based on pre-programmed parameters.

12:40 PM **Panel Q&A with all presenters**

1:00 PM **Adjourn**

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Speaker Bio's

Dr. Daniel Zitomer is Professor and chair of civil, construction and environmental engineering and director of the Water Quality Center at Marquette University, Zitomer specializes in wastewater treatment and anaerobic biotechnology. He has more than 30 years of experience consulting with entities such as Jacobs, United Water Services, Liberty Paper and others. Zitomer has authored more than 100 journal articles, proceedings papers and technical reports. He received the 2008 Gordon Maskew Fair Distinguished Engineering Educator Medal from and is a Fellow of the Water Environment Federation for outstanding service in engineering education. He is Chair of the Department of Civil, Construction and Environmental Engineering at Marquette University and presently teaches graduate classes on anaerobic biotechnology and biological wastewater treatment. He has performed research for the National Science Foundation, US Department of Energy, Milwaukee Metropolitan Sewerage District, State of Wisconsin and others.

Mauritz Botha has been a leader at the intersection of operational technology and information technology and how it applies to cloud computing and security in a connected world. Over the past 30 years, he has developed large-scale, highly-secure industrial controls for multi-national companies. He has founded numerous businesses, including IMSI-Design where he was responsible for the TurboCAD product family. He holds Masters degrees in both Electrical Engineering and Business Administration.