

LIFT, Leaders Innovation Forum for Technology

Monday, 02/11/19, 1:00

Understanding the Sensing Capabilities of Microbial Electrochemical Cells

Roland D. Cusick, Ph.D., Assistant Professor, Department of Civil and Environmental Engineering, University of Illinois
Patrick Kiely, University of Illinois

This talk will focus on the leveraging the current produced by electro-active biofilms to monitor and improve the performance of aerobic and anaerobic wastewater treatment technologies.

Monday, 02/11/19, 1:30

Installation and performance review of the first installed Algae Based Wastewater Treatment Facility

Daniel Johnson, Chief Technology Officer, OneWater Inc.

Illinois permitted its first Algae based wastewater treatment facility for construction in January of 2018 and bids were accepted for the project at the end July. Construction on the project was initiated in September of 2018 with a start-up goal of November 1, 2018. The project is a 30,000 gpd surface discharge system near Gardner, Illinois which services a premanufactured housing community. The Plant discharges into the Mazon River and must comply with a 10 CBOD5, 12 TSS, and 0.9 NH3 permit limit.

Monday, 02/11/19, 2:00

Digital Water: Treatment Plant Operational Improvements Enabled by Machine Learning

Andrew Chastain-Howley, Director of Water Solutions, Atonix Digital

Treatment Plants are complex facilities which require experienced operators to keep them running. However, there are many basic tasks and analyses which can take up significant parts of the working day and can reduce the time spent on truly running the plant and the effectiveness of those operations. This presentation will outline some of the automation, data management and machine learning techniques being developed to remove those repetitive tasks, and to allow operators and management alike to concentrate on running the plants more effectively. Pumping efficiencies can be gained by constant feedback on flow dynamics and efficiency, process improvements can be better understood if the masses of time-series data are able to be automatically monitored and visualized, and regulatory requirements can be improved with online analyzers and alerting when trends (as defined through machine learning) predict future issues. Each of these features and benefits will be discussed outlining real world data and applications from water and wastewater utilities in North America and Asia.

Monday, 02/11/19, 3:00

Emerging Water Reuse Frameworks for Military Sustainment and Resiliency

Dr. Martin Page, , US Army Corps of Engineers

This presentation will provide an overview of water reuse frameworks and technologies being evaluated by the US Army Engineer Research and Development Center. Frameworks under investigation include building scale non-potable reuse, building scale direct potable reuse, gray water recycling, and centralized direct potable reuse. Technologies being demonstrated include intermittent biofiltration, membrane bioreactors, membrane filtration, and advanced oxidation processes. Associated health risk and life cycle cost analyses will also be discussed.

Monday, 02/11/19, 3:30

Membrane Aerated Biofilm Reactors: A Pilot Scale Study

Leon Downing, Principal Process and Innovation Leader, Black & Veatch

Sandeep Sathyamoorthy, Principal Process and Innovation Leader, Black & Veatch

Membrane Aerated Biofilm Reactors (MABRs) hold promise to revolutionize the delivery of oxygen for biological treatment in Water Resource Recovery Facilities (WRRFs). The MABR combines the benefits of process intensification (i.e., increased loading capacity and reduced footprint), with aeration efficiencies up to 2 times higher than fine bubble aeration, as reported by the manufacturers. For the retrofit of an activated sludge basin, a hybrid process is typically employed, where both the suspended sludge and MABR participate in biological treatment. Pilot testing results will be presented for the MABR from a research collaboration led by Black & Veatch in California.

Monday, 02/11/19, 4:00

Introducing the First Full-Scale Membrane Aerated Biofilm Reactor

Amy Underwood, , Walter E. Deuchler Associates, Inc.

Yorkville-Bristol Sanitary District (YBSD) is subject to complying with a Total Phosphorus (TP) effluent limit compliance schedule under their National Pollutant Discharge Elimination System (NPDES) permit. In addition, local industries were planning to send waste streams with a high organic loading relative to their hydraulic discharge. This impending higher organic load coupled with implementing Biological Phosphorus Removal (BPR) by converting aeration tanks to anaerobic tanks will significantly reduce the existing treatment capacity. The existing treatment plant site is built-out and any increase in conventional treatment will require a separate treatment plant on adjacent property, which will be a large capital expenditure. In conjunction with Biological Phosphorus Removal (BPR), YBSD elected to install a Membrane Aerated Biofilm Reactor (MABR) system to increase organic treatment capacity and meet the new TP limit without construction of a separate treatment plant.

Sustainability

Monday, 02/11/19, 1:30

Sustainability Introduction Roundtable

Dominic Brose, , MWRDGC

Young Professionals

Monday, 02/11/19, 3:00

The Value of Participation in Professional Societies

Monday, 02/11/19, 3:30

Mentorship: How to Identify and Learn from Experienced Individuals

Monday, 02/11/19, 4:00

Panel Discussion: Tips for Your Future Career

Biosolids

Monday, 02/11/19, 1:00

Mitigating the Unintentional Consequences of Biological Phosphorus Removal at MWRD, Colorado

Blair Wisdom, Technology and Innovation Officer, MWRD (Denver)

Waste sludge from biological phosphorus removal systems has been associated with negative impacts to anaerobic solids digestion and dewatering processes. Ahead of instituting a large-scale full plant biological phosphorus removal process, Metro Wastewater Reclamation District in Denver, CO, conducted in-depth pilot-scale investigations of WAS release pretreatment and post-digestion phosphorus recovery technologies as possible approaches to mitigate undesirable effects of Bio-P on the facility's solids treatment and handling processes. Results from these evaluation will be presented to show impact to nuisance struvite production in the anaerobic digesters and downstream infrastructure, impacts to total biomass for dewatering and hauling, and dewaterability.

Monday, 02/11/19, 1:30

Energy Efficiency and Nutrient Reduction Through Process Optimization in Aerobic Digester

Payal Shah, Process Engineer, Xylem Inc.

Digesters in wastewater treatment plant is the second most energy consuming unit next to biological treatment. If not used properly then it can increase nutrient loading by up to 50% in main stream secondary process via recycle. Poorly operated system can lead to treatment instability and high chemical consumption. This abstract explains the basis of Aerobic Digestion Process and emphasis on how to optimize energy, reduce nutrient recycle and chemical consumptions in design and operation.

Monday, 02/11/19, 2:00

A Survey of WRRF Biosolids: Identifying the Parameters Affecting Dewatering from Bio-P and THP

Jeff Nicholson, HRSD Intern, Graduate Student, Virginia Tech

Improving the dewatered cake solids of biosolids at water resource recovery facilities (WRRF) is important in order to control costs of fuel for hauling or incineration, tipping fees for landfilling, or real estate and structures dedicated to onsite storage. A survey of biosolids from Bio-P and non Bio-P plants were analyzed and dewatered in order to identify the primary parameters controlling dewatering. Reactor studies were also conducted in order to evaluate the effects of removing phosphorus from a Bio-P waste activated sludge (WAS) and the effects of thermal hydrolysis pretreatment (THP). The effect of THP on the anaerobic digestion and dewatering of separated primary and WAS biosolids was also investigated.

Monday, 02/11/19, 3:00

A Story of Biosolids Autocatalytic Pyrolysis: Process Scalability and Biochar Applications

Dr. Zhongzhe Liu

Improving on-site energy generation and recovering value-added products are common goals for sustainable used water reclamation. A new process called autocatalytic pyrolysis was developed and validated to greatly enhance energy recovery from biosolids on a bench scale, sub-pilot scale, and pilot scale. The biosolids autocatalytic pyrolysis process can be coupled with other existing technologies and applications to simultaneously enhance energy recovery, minimize adverse environmental impacts, and generate value-added products from wastewater.

Monday, 02/11/19, 3:30

Marketing of the Metropolitan Water Reclamation District of Greater Chicago's EQ Compost

Dominic Brose, , MWRDGC

In the fall 2018, the Metropolitan Water Reclamation District of Greater Chicago (MWRD) was requested by the associate vice president, marketing and communication for Loyola University Chicago to present to a marketing class an overview of the EQ Compost program. The class was broken into several groups and each group will develop a marketing plan to address the needs identified in the MWRD's presentation. The winning team will present the marketing plan to the MWRD Board of Commissioners. This talk will provide an overview of current marketing efforts at the MWRD for EQ Compost, present the elements of the winning marketing plan developed by the Loyola University students, including target markets and outreach strategies, and discuss how those marketing elements will be incorporated into future efforts.

Monday, 02/11/19, 4:00

Capture Phosphate by Designer Biochars Produced from Biosolids: A Win-Win Strategy

Dr. Wei, Senior Research Scientist/ Adjunct Faculty, NRES Illinois Sustainable Technology Center

This presentation is to illustrate designer biochars that can effectively adsorb dissolved phosphorus. The designer biochars were generated from biomass pre-treated with lime sludge collected from water treatment plants. The use of the designer biochars to capture phosphorous could be a win-win strategy, which converts waste biosolids to valuable products and reduces nutrient losses.

Laboratory

Tuesday, 02/12/19, 9:00

Regulatory Update

Scott D. Siders, Director of Quality Assurance, PDC Laboratories, Inc.

Tuesday, 02/12/19, 9:30

The Importance of Proper Sample Collection

Justin Monroe, Environmental Chemist, Metropolitan Water Reclamation District of Greater Chicago

There are several users of data provided by a wastewater treatment facility. With so many depending on reliable data, it is paramount that the results of analyses are accurate and precise. The collection of samples has a significant impact on the accuracy and precision of analytical results. Sample contamination, improper containers/labels, and lack of documentation are potential causes for inaccurate data. Implications of using inaccurate data can range from improper plant process adjustments to receipt of noncompliance fines from the Environmental Protection Agency. This informative presentation will be of value to entry level treatment works employees as a training tool.

Tuesday, 02/12/19, 10:30

Ammonia Measurement by Ion Selective Electrode

Eric Link, LabtronX

Ammonia is Basic. It has been used by man for thousands of years. But now the world uses 140 million tons of ammonia each year and in the USA 36 million tons are used just as fertilizer. It is no wonder that it ends up in our water and monitoring ammonia has never been more important. How do we measure ammonia correctly, what are the pitfalls we may run into, and how do we maintain our equipment? This presentation will focus on how ammonia meters actually work and how to get more accurate and reliable ammonia readings.

Tuesday, 02/12/19, 11:00

Understanding Oil and Grease

David Smith, Technical Director, Environmental Express

Oil and Grease is a fairly common parameter for environmental compliance monitoring. As a method defined analyte it is limited in the amount of flexibility given to adapt the analysis to various circumstances. Understanding what is happening during the analysis will help the analyst make better decisions in working with difficult samples and deciding how to best approach the procedure. We will discuss the two most common variations, liquid-liquid extraction and solid phase extraction, as well as the advantages and disadvantages of each method.

Tuesday, 02/12/19, 11:30

Quality Assurance in the Lab

Cora Fickinger, Quality Training Officer, Teklab, Inc.

Quality Assurance is obtained by implementing the quality controls necessary to provide reliable data. The QC requirements of some of the basic wastewater testing methods will be discussed, including where to find them and how to use them to support the validity of your lab results.

Wet Weather

Tuesday, 02/12/19, 9:00

Cost-effective Combined Sewer Overflow Long-term Control Pla

Jennifer Anders, Senior Client Manager, Vice-President, Woodard & Curran

Andrew Jackson, Director, Monmouth IL Department of Public Works, City of Monmouth

Case study for the revision of a Combined Sewer Overflow (CSO) Long-Term Control Plan (LTCP) for the City of Monmouth, Illinois will be presented in order to understand the challenges, opportunities, constraints, costs and benefits for a small community to cost effectively address CSOs. The presentation will focus on the City's historical improvement projects, coordination efforts with Illinois Environmental Protection Agency (IEPA), flow monitoring, hydraulic modeling, and recommendations to provide the City with a cost effective upgrade to their existing end of pipe CSO management system and drive to achieve compliance with a 2008 IEPA Compliance Commitment Acceptance Letter.

Tuesday, 02/12/19, 9:30

Green Infrastructure and Its Economic Impacts

Paul E. Hurley IV, EIT, ENV SP, Mr., Greeley and Hansen

Green Infrastructure is a growing trend in stormwater management, and while many are familiar with the concept, the details are still obscure. The term Green Infrastructure (GI) describes structures or practices that manage stormwater using natural processes to treat and control runoff. While these can be aesthetically pleasing and energy saving, an understanding of GI principles is crucial to the value added engineering that creates healthy urban landscapes. The goal of this presentation is to provide background on common GI installations and practices, assess how effective they are, and discuss the common challenges that municipalities face when incorporating GI.

Tuesday, 02/12/19, 10:30

Intelligent Odor Warning System at an MWRD Reservoir

Nina Kshetry, President, Ensaras, Inc.

John Mulrow, PhD Candidate, University of Illinois at Chicago

Data analytics and Intelligent Water Systems are poised to play major roles in addressing operational challenges of utilities in the future. We will present our work on using advanced analytics combined with artificial intelligence for developing an advanced warning system for odors at the Metropolitan Water Reclamation District of Greater Chicago's (MWRDGC) Thornton Composite Reservoir (TCR). More broadly, we will summarize some key steps wastewater utilities can take to better position themselves for readily deploying advanced analytics and intelligent water systems.

Tuesday, 02/12/19, 11:00

Biological High-Rate Clarification with use of Existing SBR

Jeff Miller, Process Engineer, Veolia

The City of McHenry, IL recently installed a Biological High-Rate Clarifier system to treat wet weather flows up to 10 MGD for BOD and TSS removal. The plant also installed an SBR system to treat everyday flow. The design was set up so that one of the SBR basins would automatically become the biological contact tank for the Biological High-Rate Clarifier during a wet weather, high-flow event. By having fresh process water in the largest basin in the system, the start-up time of the Clarifier is reduced by roughly 75% during a rain event.

Tuesday, 02/12/19, 11:30

Hurricane Harvey: Damage and Recovery at the Conroe Southwest Regional WWTP

Paul Wood, Associate, Lockwood, Andrews & Newnam, Inc.

Greg Hall, Superintendent, City of Conroe, Texas

Hurricane Harvey hit the Texas coast on August 26, 2016. The Conroe Southwest Regional Wastewater Treatment Plant (WWTP) lies south of Lake Conroe. Lake Conroe released water at a record 79,000 cfs. These releases swelled the downstream San Jacinto river and overtopped the levee that normally protects the Southwest Regional Plant, causing staff to be air lifted out on August 28, 2017. Through heroic efforts of the City staff, support by local vendors and repair shops, the plant was able to return to operation on August 3, 2017 three days later, and meeting permit on August 4, 2017.

Nutrients 1

Tuesday, 02/12/19, 9:00

Balancing operations, reliability and costs needed to achieve phosphorus removal

Susan Guswa, Wastewater Practice Leader, Woodard & Curran

Paul Dombrowski, Senior Principal, Woodard & Curran

Total phosphorus removal has long been required by many water resource recovery facilities (WRRF) that discharge to inland waters. In recent years, more and more facilities are being required to meet effluent total phosphorus limits of 0.1 mg/L or lower. Meeting these limits typically requires a balance of capital improvements, O&M costs and an investment of human resources. This presentation will provide an overview of how WRRFs can implement proven and

evolving technologies to provide a balance between these investments. The presentation will include case studies that have implemented combinations of technologies and operational measures to achieve consistent performance.

Tuesday, 02/12/19, 9:30

Phosphorus Influent Reduction Measures

Chris DeSilva, Professional Engineer, Greeley and Hansen

Water resources recovery facilities (WRRFs) are seeking cost effective approaches to reduce their total phosphorus effluent concentrations. Effluent phosphorus levels can be reduced by using phosphorus removal technologies at the WRRFs and by using influent reduction measures. A key step in reducing influent phosphorus load is understanding the current phosphorus levels of these sources and implications on phosphorus reduction of proposed reduction measures. Quantifying the impacts and implementing influent reduction measures can be a challenging task, but a potentially cost effective component of an overall phosphorus removal strategy.

Tuesday, 02/12/19, 10:30

Doubling Down on Phosphorus

Rachel M. Lee, P.E., Sales Manager, Ostara Nutrient Recovery Technologies Inc.

Matt Seib, Ph.D., P.E., Process and Research Engineer, Madison Metropolitan Sewerage District

The Madison Metropolitan Sewerage District (MMSD) installed Ostara's nutrient recovery system including Pearl and WASSTRIP at their Nine Springs plant in 2013. The system started up well and achieved several benefits for MMSD; however, the phosphorus recovery for the system fell short of expectations. In recent years, Ostara and MMSD collaboratively tested several strategies with goals of improving recovery and reducing fines loss. Efforts have yielded twice as much phosphorus recovery increasing the average monthly Crystal Green production from 1 ton/day to 2 tons/day and they have reduced the fines loss from around 60 percent to less than 30 percent.

Tuesday, 02/12/19, 11:00

Tons of Green: Algae-based Nutrient Recovery

Leo Kucek, Project Engineer, Applied Technologies, Inc.

Nutrient-rich surface waters across our region teem with uncontrolled algae. However, algae can also be harnessed to drive a "green" economic and environmental future via nutrient recovery. To meet ultra-low phosphorus limits, two facilities evaluated various technologies, including algae-based advanced biological nutrient recovery (ABNR). ABNR pilot tests confirmed that these systems could consistently meet effluent phosphorus concentrations below the detection limit (0.02 mg/L). At each facility (2 and 5.5 mgd), these systems are expected to generate millions in annual revenues, offering a sustainable waste recovery process. Results will be presented from two facility plans wherein algae-based ABNR technology was evaluated.

Tuesday, 02/12/19, 11:30

Enabling Fully Integrated Wastewater Resource Recovery

Autumn Fisher, Regional Director of Project Delivery, CLEARAS Water Recovery

Wastewater resource recovery lies at the heart of the global circular economy. Increasing pressure on freshwater resources for communities and industries, as well as demand for the recovery of additional value from generated waste streams benefiting the bottom-lines of cities and manufacturers, requires the advent of new biological technologies capable of performing those tasks at unprecedented levels. As early adopters, South Davis Sewer District are paving the way to the future with their implementation of Advanced Biological Nutrient Recovery (ABNR) technology under

construction as the first commercially integrated resource recovery facility of its kind in the world. CLEARAS Water Recovery has pioneered the most effective biomechanical platform in commercial operation to date for industrial and municipal wastewater treatment, using advanced information management systems, sensor arrays, and the naturally aggressive nutrient uptake properties of microalgae to effectively remove 99.9% of excess phosphorus and nitrogen, along with other common contaminants, from wastewater without the need for costly chemicals or acres of open raceways. The South Davis full-scale 4 million gallon per day ABNR installation and ground-breaking was announced in May 2017, in conjunction with the construction of a regional food waste-to-energy project set to produce an amazing energy footprint offset for the district and their ratepayers. In addition to their energy savings, the District is recycling the CO2 produced from this food waste to energy or combined heat and power (CHP) operation as an essential input to their ABNR platform. South Davis and CLEARAS are a case study in the economic benefits in transitioning from traditional, linear wastewater treatment to true resource recovery facilities for businesses, communities, and the world. Once fully operational, it is expected that South Davis will produce energy savings of nearly 734 megawatt hours with 1,100 tons of dry-weight biomass per year for use in downstream industries as varied as soil enhancement to bioplastics to protein supplements.

Pretreatment

Tuesday, 02/12/19, 1:00

2018 US EPA Pretreatment Training Highlights and Update

Eduardo Gasca, Senior Environmental Engineer, St. John-Mittelhauser & Associates, Inc.

In 2018, the US Environmental Protection Agency (US EPA) sponsored a series of two-day Clean Water Act NPDES Pretreatment Training. One of this training was offered in Indiana at the Indiana Government Center on July 18-19, 2018. The main target audience was municipality representatives in charge of the Publicly Owned Treatment Works (POTW) or entity that normally enforce the Pretreatment regulations to those Industrial Users that discharge their effluent to municipal wastewater sewer and wastewater treatment works. The purpose of this presentation is to help disseminate the information presented during this training sessions. This presentation is essentially a summary of the 2-day training which includes a general overview of the Pretreatment program, regulations and standards; approaches to develop industrial user inventories and industrial users classification; resources available for industrial user inspections, reporting requirements; regulating Non-Categorical Significant Industrial Users; common deficiencies of Sewer Use Ordinances (as observed by US EPA), Enforcement Response (as presented by US EPA); when Significant Non-Compliance is reached by IUs, and constituents or parameters of concern that US EPA is studying and evaluating to include in the Pretreatment program.

Tuesday, 02/12/19, 1:30

Industrial Pretreatment Essentials-Identifying Industrial Use

Nichole Schaeffer, Environmental Department Manager, Baxter & Woodman, Inc.

The USEPA National Pretreatment Program Headquarters gave an estimate in May 2017 at the National Association of Clean Water Agencies (NACWA) National Pretreatment Conference that over 500 categorical industrial users (CIU) in Illinois are operating without control mechanisms and discharging unregulated categorical process wastewater to treatment facilities (WWTF). It is crucial for wastewater treatment facilities with and without pretreatment programs understand how to locate and identify industrial and commercial users in order to survey and evaluate the industrial processes, liquid chemical storage for spill potential assessment, and waste stream generation, pretreatment, discharge and or disposal.

Tuesday, 02/12/19, 2:00

EPA Pretreatment Compliance Inspection Preparedness

Karen K. Clementi, Vice President, Deuchler Environmental, Inc.

Tim Rubis, Environmental Compliance Coordinator, Fox Metro Water Reclamation District

Is your facility prepared for a U.S. EPA Pretreatment Compliance Inspection (PCI)? Pretreatment compliance is a renewed priority for the U.S. EPA and they will be increasing both the number and frequency of PCIs in Illinois. In June 2018, the Fox Metro Water Reclamation District (FMWRD) had their first PCI in 15 years.

This presentation will focus on the recent experience during FMWRD's PCI and the U.S. EPA's specific priorities. The presentation will provide guidance on: Pre-Inspection Paperwork, Format and Procedures, Interviews, Site Visits, File Review Preparation, Lessons Learned, Tips for a Successful PCI

Tuesday, 02/12/19, 2:30

Conducting Pretreatment Site Inspections

Lisa G. Lucht, , Baxter and Woodman

Unauthorized wastewater discharge from industries and other non-domestic sources can cause significant problems at wastewater treatment plants, including hazardous conditions, interference of operations, and pass-through of pollutants. Site inspections are essential to fully understand an industry's process and to correctly classify an industry for both approved and non-approved pretreatment programs. This talk's focus will present guidance from the 2017 "USEPA Industrial User Inspection and Sampling Manual for POTWs", and suggestions for key questions to ask of several industrial user types for classification and confirmation of compliance.

Energy

Tuesday, 02/12/19, 4:00

Upgrades to the Secondary Treatment System to Increase Process Efficiency and Decrease Operating Costs

Andrew Deitchman, Senior Project Manager, Walter E. Deuchler Associates, Inc.

Joel Ilseman, Operations Supervisor, Fox Metro Water Reclamation District

Walter E. Deuchler Associates, Inc. collaborated with Fox Metro Water Reclamation District to improve the single stage nitrification activated sludge process to increase plant efficiency and prepare the process for future conversion to biological phosphorus removal. The improvements included air main replacement, process instrumentation addition, blower replacement, and implementation of a dissolved oxygen control system.

Significant energy savings are obtained as a result of the blower replacement and air valve control scheme optimization. Data trends show the DO control curves tracking the DO setpoints. The 20-year present worth of the power savings realized by the project is approximately \$3.38 million.

Tuesday, 02/12/19, 4:30

CHP and Solar Systems in Wastewater Treatment

Jorge Carvajal, Mechanical Engineer, Greeley and Hansen

The City of Lafayette, Indiana, through their program Lafayette Renew, has embarked on a mission to reduce energy consumption in their wastewater treatment plant. The plant understands that while a portion of digester gas is currently used for digester and building heating, there are opportunities to further optimize digester and natural gas utilization by improving solids and waste handling processes. Additionally, the plant has long envisioned the installation of a solar field to accomplish their long-term goal of energy and carbon neutrality. Greeley and Hansen studied different scenarios and technologies to help Lafayette Renew accomplish their immediate and future goals.

Tuesday, 02/12/19, 1:00

Customizing Your Energy Mix: Can Solar Improve Plant Operations?

Charity Sack, Sol Systems

With the implementation of Illinois' recently passed Future Energy Jobs Act (FEJA), solar energy is rising rapidly as a preferred source of power in Illinois. Given the potential for reduced energy costs, utilities and plant operators are re-evaluating their energy mixes. This session is designed to provide plant operators with a case study containing resources and information needed to understand what solar options are available in Illinois, the impact on financial and sustainability goals, and notable challenges when pursuing solar energy.

Tuesday, 02/12/19, 1:30

Energy and Cost Saving Opportunities for Wastewater Processes

Ryan Siegel, Energy Engineer, Smart Energy Design Assistance Center (SEDAC)

Chad Kruse, Manager, Office of Environment, Illinois Environmental Protection Agency

Energy use can significantly impact local governments' annual operating budgets, especially for local governments that own and operate wastewater treatment facilities. Energy efficiency improvements can save energy and money, and provide other economic and environmental benefits for local governments. This session will focus on energy-saving opportunities at wastewater facilities, highlighting case examples from the Illinois EPA's Wastewater Treatment Plant Assessment Program, and discussing ways to overcome common implementation barriers. Available technical support and funding opportunities across Illinois will be featured to help facilities achieve energy reduction and cost-savings.

Tuesday, 02/12/19, 2:00

Choosing the Right Blower Technology

Travis L McGarrah, Product Manager - Blowers, Atlas Copco

For several decades, lobe and multistage blowers had been the tried and true blower technologies for wastewater treatment plants, and until recently there had been no major developments in this portion of the wastewater treatment process. However, over the past 15 years the demand for increased energy efficiency has led to major advances in the available equipment to provide aeration. The primary technologies developed over the last 15 years have been single-stage integrally geared centrifugal blowers, positive displacement screw blowers, and high speed direct-drive centrifugal blowers. These technologies can greatly reduce the power consumption and electricity costs of a plant.

Tuesday, 02/12/19, 2:30

Managing the Migration of Outdated Programmable Logic Controllers

Thomas Powell, Instrumentation and Controls Group Head /Associate, Greeley and Hansen

Water and Wastewater treatment plants require many types of monitoring and control systems for automation and equipment monitoring. How systems work together and communicate defines project success. As these systems age, performance can diminish and repair costs can skyrocket.

Many times the process control system is either left as originally installed or modified through multiple contracts resulting in either a hybrid system of multiple vintages and manufacturers. The method of replacement migration an outdated system can present operational, construction, and engineering challenges.

An engineered migration can improve process system operation, energy efficiency, and improve information available to operators.

Tuesday, 02/12/19, 4:00

GreenBush CSO Tank- Electrical Design Innovation

Nitika Yadav, Electrical Engineer, Greeley and Hansen

Brian R. Goldman, Electrical Engineer- Associate and Electrical Group Head, Greeley and Hansen

The Greenbush CSO Storage Tank project provided a spark to transform the city's underutilized area and serve as a spring board for the redevelopment of the site. An electrical building was constructed to house electrical and control components. Electrical and Control Design considerations and challenges included: electric utility coordination, NFPA 820 compliance, maintenance considerations, flood risk mitigation, security, aesthetics, safety and complete automation. The Project design involved making sure the top of the tank has minimum or no electrical equipment above grade. The presentation will discuss the innovative solutions implemented for Electrical design using the project as case study.

Tuesday, 02/12/19, 4:30

Power in Planning - Electrical Upgrades at WSSC's Piscataway

Jay Bielanski, Associate, Greeley and Hansen

Wastewater facilities are in a constant state of change as improvements are implemented, as these improvements are implemented they compete for various resources. The competition for one resource is often overlooked, but is essential: a continuous source of reliable electrical power. Without reliable power critical wastewater treatment processes can fail and cause costly service disruptions. This paper will look at the key electrical elements that should be considered when implementing any infrastructure improvement and will present a case study discussing the challenges during the Washington Suburban Sanitary Commission's (WSSC) Piscataway WRRF Electrical Upgrades Project.

Nutrients 2

Tuesday, 02/12/19, 1:00

Thinking Differently: A Synergistic Solution for Nutrient Removal Improvements

Ted R. Bluver, Civil Engineer, Greeley and Hansen

Tim Leach, Director of Planning and Construction, Greater Peoria Sanitary District

As nutrient limits begin to take shape in Illinois, developing cost-effective solutions to satisfy new regulatory constraints can be challenging. The Greater Peoria Sanitary District proactively completed planning, design, construction, and commissioning of nutrient removal improvements. The thoughtful approach presented in this case study is useful to municipalities as it shows how nutrient removal improvements can be used as an opportunity to simultaneously reduce

operational costs through plant-wide energy savings, address other operational challenges, and supplement the capital costs for the improvements with energy efficiency grant funding and public-private partnership.

Tuesday, 02/12/19, 1:30

S2EBPR Configuration for Phosphorus Removal at DuPage County WWTP

Mark Halm, Vice President, Walter E. Deuchler Associates, Inc.

Nick Kottmeyer, Jay Dahlberg, Sean Reese, Tom Dyba, DuPage County

Walter E. Deuchler Associates, Inc. (WEDA) was retained to prepare a 'Phosphorus Removal Feasibility Plan and Discharge Optimization Plan' for the DuPage County Woodridge Greene Valley and Knollwood WWTP. The feasibility study became the basis for the design of the Knollwood WWTP. The waste was characterized, and jar testing conducted to determine metal salt chemical dosages. A calibrated process model was developed and the process performance of several alternatives were evaluated.

The biological process implemented and Knollwood can be configured for S2EBPR SSR, or an AO process. Configuration and performance data will be presented from the startup and operation.

Tuesday, 02/12/19, 2:00

Achieving Stable EBPR at Gary Sanitary District

Anthony Giovannone, Environmental Engineer, CDM Smith

Rhonda Anderson, Superintendent, Gary Sanitary District

The Gary Sanitary District operates a 60 MGD design average daily flow WWTP with an effluent total phosphorus limit that is based on a percentage removal of the influent phosphorus. Biological phosphorus removal was not reliable as influent carbon was insufficient and operational conditions were not ideal for PAO growth. GSD moved forward with a HSW receiving program at the WWTP, increasing available influent carbon for EBPR and made significant operational improvement. GSD eliminated chemical use for phosphorus removal and saving \$36,000 annually while consistently meeting their effluent phosphorus limit using EBPR and without any upfront capital costs.

Tuesday, 02/12/19, 2:30

Startup, Optimization, and Operational Results from a Biolog

Eric Redmond, Process Engineer, Black & Veatch

Leon Downing; Bikram Sabherwal, Principal Process and Innovation Leader; Senior Process Engi, Black & Veatch

Biological nutrient removal (BNR) coupled with ammonium based airflow control (ABAC) provides a process configuration and control to enhance nutrient removal, provide process stability, provide selective biological pressures and aeration energy savings. This presentation will provide 12 months of startup data related to process troubleshooting, controls optimization, and performance summary from a 189 mgd facility in Texas.

Tuesday, 02/12/19, 4:00

A Shortcut Nitrogen Removal Process for a Wisconsin WWTP

Bradley Lake, Project Manager, Strand Associates, Inc.

Troy Stinson, P.E., Senior Associate/Project Manager, Strand Associates, Inc.

The City of Fond du Lac, Wisconsin Regional Wastewater Treatment Facility is a 9.84 MGD (design average) conventional activated sludge plant. This facility co-digests high strength waste with excess biosolids in its temperature phased anaerobic digestion process (TPAD) to generate energy in a biogas engine. However, digestion of the high-strength waste results in large ammonia recycle loading back to the aeration tanks from the centrate generated by the centrifuge

dewatering process. This facility will soon start-up a shortcut nitrogen removal process which reduces ammonia in the centrate prior to recycling to the aeration system.

Tuesday, 02/12/19, 4:30

Fermenters and Sidestream Phosphorus Treatment: Process Design and Practical Considerations

Jennifer Loconsole, Civil Engineer, Black & Veatch

James Kerrigan, Sr. Project Engineer, Fox River Water Reclamation District

The Fox River Water Reclamation District (FRWRD) in Elgin, IL owns and operates three water reclamation facilities (WRFs), the Albin D. Pagorski WRF (ADP WRF), the North WRF (NWRF) and the West WRF (WWRF). Special testing at the three water reclamation facilities concluded influent wastewater did not have sufficient readily biodegradable organics for reliable biological phosphorus removal. Several configurations for primary sludge fermentation were evaluated during preliminary design as a means of supplementing readily biodegradable organics. In addition, the biological phosphorus removal process proposed at the North and ADP WRFs has inherent flexibility, allowing several basins to be configured for fermentation of return activated sludge (RAS).

RAS fermentation, otherwise known as sidestream enhanced biological phosphorus removal (S2EBPR), is an emerging technology that has been found to enhance the performance of the process. This presentation will provide an overview of the biological phosphorus removal processes proposed to be implemented at the three WRFs, and provide details on practical design considerations required to enable the S2EBPR process while allowing process operations flexibility.

Collections

Tuesday, 02/12/19, 1:00

Implementation of the Infiltration / Inflow Control Program

Michael Zigulich, Associate Civil Engineer, Metropolitan Water Reclamation District of Greater Chicago

This presentation will focus on the requirements and progress made in the Short Term Program of the Metropolitan Water Reclamation District of Greater Chicago's Infiltration / Inflow Control Program (IICP). IICP provides a framework for asset management of separate sewer systems with the goals of preventing sanitary sewer overflows and basement backups, complying with the District's NPDES permits, including federal, state, and local regulations, and minimizing extraneous flows transported to the District's facilities due to defective system components or illegal connections.

Tuesday, 02/12/19, 1:30

Calumet Tunnel and Reservoir Plan History and Impact

Dylan Cooney, Dylan Cooney, PE, MWRDGC

The Metropolitan Water Reclamation District of Greater Chicago (District) adopted the Tunnel and Reservoir Plan (TARP) over 40 years ago to reduce pollution and flooding from combined sewer overflows (CSOs) in the Chicagoland area. The Calumet TARP System serving the south side of Chicago and suburbs was completed in 2015 when the Thornton Reservoir was placed into operation. The presentation will describe the Calumet TARP system and its impact on the community, including reductions in CSOs and flooding protection for over 182,000 structures within its service area.

Tuesday, 02/12/19, 2:00

Keep Out the Rain - Kansas City's Private I/I Program

Sara Goebel, Staff Civil Engineer, Burns and McDonnell Engineering

Cliff Cate, Director of Water/Wastewater Collection System, Burns and McDonnell Engineering

The Private I&I Reduction Program taking place in Kansas City, Missouri includes removing rainwater from the Sanitary System. Kansas City's "Keep out the Rain" program (KOTR) has completed its second year and is well into its third year. We'll look at the set up of the Program, sources we are removing, technologies we are using for collect/manage data, also the source removal process including coordination with pre-qualified plumbers and the agreed upon unit prices. We'll also be looking at the tremendous success in cost effectiveness, staying well under the \$1.15/gpd removal goal of the program.

Tuesday, 02/12/19, 2:30

Creating Efficiencies Using Mobile GIS and Operational Dashboards for Wastewater Systems

Kyle Engelking, GIS Specialist, Symbiont

Ryan Eckdale-Dudley, GISP, Director of Business Development, Symbiont

The margin for efficient and precise record keeping is razor thin today as we are able to create and obtain data at the tip of our fingers 24/7. This has forced many utility operators to turn to a shared Geographical Information System (GIS) to help them maintain and improve their asset management systems and record keeping. This presentation will focus on several small to mid-sized wastewater utilities and their approach to using a GIS to maintain their wastewater infrastructure assets and aid in their various reporting activities.

Tuesday, 02/12/19, 4:00

Reducing Collection System O&M Costs by Eliminating Lift Stations with Deep Gravity Sewers

Jordon Thomas-Harris, Project Engineer, Lockwood, Andrews & Newnam, Inc.

Jeremy Nakashima, PE, Wastewater Practice Leader, Lockwood, Andrews & Newnam, Inc.

Sewage treatment services on the far west side of Houston are currently contracted with the Chelford City Municipal Utility District at an annual cost of \$600k. After performing a detailed life cycle cost analysis (LCCA) of this arrangement, the City initiated the Chelford City Diversion project to divert flow to their Upper Brays Bayou WWTP, which will eliminate annual contract costs, utilize unused capacity at the Brays Bayou WWTP, and reduce O&M costs of operating nine lift stations. This presentation will discuss the LCCA evaluation and the design and construction challenges of the selected project.

Tuesday, 02/12/19, 4:30

Under the River and Through the Pipelines

Pierce Smith, Engineer, LAN, Inc.

Jeremy Nakashima, Wastewater Practice Leader/Regional Manager, LAN, inc.

This case study explores the major challenges faced during the design of a 66-inch interceptor for the City of Fort Worth within a city owned golf course. One challenge encountered was the design of a two-barrel inverted siphon with a wide range of flows that also minimized at grade impacts.

Another major design challenge was addressing a conflict between two gas pipelines and the proposed interceptor profile. This was accomplished by splitting portions of the interceptor into reduced sized parallel lines at each pipeline crossing and "threading the needle" between the pipelines.

Operations 1

Wednesday, 02/13/19, 9:00

Do You Need a Computerized Maintenance Management System (CMMS)?

Bruce Buttler, Urbana & Champaign Sanitary District

The Urbana & Champaign Sanitary District (UCSD) has two treatment plants, twenty eight lift stations, ninety five miles of sewers, and 2200 manholes to maintain with a staff of twenty and a support staff of two. These facilities and staff serve over 150,000 customers. UCSD incorporated the use of a centralized purchasing system and Computerized Maintenance Management System (CMMS) in the mid 1980s. Although the phrase Asset Management was not a phrase commonly used back then, elements of a modern Asset Management Plan were included in the CMMS. See what UCSD does to make this system work, along with some of the many intangibles the District has to work around, and well as the always interesting lessons learned the hard way.

Wednesday, 02/13/19, 9:30

Let the Water Flow: Startup of a New Aerated Grit Facility

Ryan Christopher, Associate, Greeley and Hansen

Paul O'Brien, Principal Civil Engineer, Metropolitan Water Reclamation District of Greater Chicago

The Imhoff Replacement Project was implemented to upgrade the primary and preliminary treatment at the Stickney WRP. The replacement project included demolition of existing Skimming and Imhoff Tanks and the installation of a new

Aerated Grit Facility and nine Primary Settling Tanks capable of treating 720 MGD. The startup of a system this large requires careful planning in order to not affect the overall treatment that is ongoing and provide Maintenance and Operation staff the ability to work out challenges with the new system. This presentation will discuss the lessons learned from the startup of the 720 MGD project.

Wednesday, 02/13/19, 10:30

Ultraviolet Disinfection: Tips, Tricks and Considerations

Paul Wood, Associate, Lockwood, Andrews & Newnam, Inc.

Jeremy Nakashima, Senior Associate, Regional Manager, Lockwood, Andrews & Newnam, Inc.

Ultraviolet Disinfection is a reliable technology. The current standards for application of this technology are well documented but can be somewhat confusing. NWRI guidelines are directed at reuse and discharge standards, such as the Ten State Standards have not been updated for more than 14 years. The WEF publication Ultraviolet Disinfection for Wastewater provides guidance and rationale for implementation. A case study of a current design will be provided, which shows historical plant data analyzed, and results of a collimated beam test and considerations to determine system sizing. Reuse issues will also be covered.

Wednesday, 02/13/19, 11:00

Chemical Phosphorus Removal - Design and Operation Considerations

Stephen Dennison, Senior Project Manager, Engineering Enterprises, Inc.

Chemical Phosphorus Removal (Chem-P) is often required for Wastewater Treatment Facilities to consistently meet their respective permit limit. However, Chem-P systems have often turned into operations and maintenance headaches for Operators. This presentation will provide an overview of design considerations for Chem-P systems at Wastewater Treatment Facilities, including regulatory requirements, chemical options, equipment sizing, and chemical injection (discharge) point options. Practical considerations will be presented based upon lessons learned from existing systems. Furthermore, recent case studies for Chem-P systems at the Carpentersville, IL WWTF (Ferric Chloride) and Huntley, IL East WWTF (Aluminum Sulfate) will be highlighted.

Wednesday, 02/13/19, 11:30

Process Monitoring and Control for Biological Phosphorus Removal

Mark J. Halm, Vice President, Walter E Deuchler Assoc Inc

Darrin B. Boyer, Joel Ilseman, Wastewater Superintendent, Operations Supervisor, City of Plano, Fox Metro Water Reclamation District

Walter E. Deuchler Associates, Inc. (WEDA) has completed several phosphorus removal feasibility studies, pilot and full-scale designs of BPR facilities in Illinois ranging from 2.44 MGD to 42 MGD.

While useful, desktop models of biological phosphorus removal may not translate into successful designs and as a result there may be operational and compliance issues.

The presentation will address waste characterization for design, flexibility of process design, monitoring and control.

Data will be presented including design rule-of-thumb ratios for successful treatment versus actual performance.

Environmental monitoring: ORP, and nitrate concentrations will be presented showing the impact of these conditions on operations.

Operations 2

Wednesday, 02/13/19, 1:30

Boosting Conservation and Efficiency for Water and Wastewater Treatment: Automated Solutions for Optimizing Aeration Blowers

Bob Kisler, sales manager, Gardner Denver

High power usage, rising costs, and external pressure to boost conservation and efficiency are pushing wastewater treatment plants to find innovative solutions to reduce power consumption and cut costs. Multistage centrifugal blowers offer opportunities to reduce costs and energy consumption by adjusting speed and flow rate to meet demand. This can be done manually using a butterfly valve to throttle the inlet. To move away from traditional butterfly valve throttling, you can replace the valve with a VFD (Variable Frequency Drive).

As Newnan Utilities discovered at its Wahoo Creek Facility, Variable Frequency Drive (VFD) technology can be extremely effective at reducing operating costs while boosting performance and efficiency. By utilizing advanced VFD technology, Newnan Utilities was able to adapt the speed of their blowers to the constantly fluctuating load requirements, minimizing energy consumption, while allowing the plant to maintain its level of award winning focus on performance and environmental efficiency.

In this paper, we compare VFD technology with manual inlet valve throttling, present estimated energy and cost savings, discuss ancillary equipment that is required to successfully retrofit existing aeration blowers to accommodate VFDs, and review a case study on that demonstrates successful application of advanced VFD technology at the Newnan Utilities Wahoo Creek Facility.

Wednesday, 02/13/19, 2:00

The Real Science Behind Polymer Activation

Peter D Herlihy, Regional Sales Manager, UGSI Solutions Inc.

The cost of polymer is frequently the third largest operating expense at many wastewater treatment plants. While higher molecular weight is required to achieve more efficient flocculation, it also presents technical challenges in the preparation of polymer solutions.

This presentation illustrates how to maximize the value of polymer by understanding fluid dynamics and polymer chemistry. It includes different mixing technologies on the effectiveness of polymer solution. Field evaluation showed that a well-designed polymer mixing system can improve the performance of screw press and gravity belt thickener as well as lead to significant polymer savings of up to 31%.

Wednesday, 02/13/19, 2:30

An Introduction to WaterOperator.org

Steven Wilson, Illinois State Water Survey at Prairie Research Institute

WaterOperator.org provides free resources from over 800 organizations (federal and state agencies, technical assistance providers, associations, trainers, etc.) that serve the water and wastewater industry. It includes a national training calendar listing nearly 15,000 workshops, training events, webinars, and conferences annually. There are links to over 18,000 resources (handbooks, videos, manuals, guides, and websites) that cover every aspect of operations, compliance, capacity development, regulations, and best practices for both water and wastewater operators. All information is free and publicly available for download. Additional resources about water industry careers and source water protection for groundwater are also available through the website. This presentation will provide an overview of the resources

available for wastewater operators, and explain how to get the most benefit from the website.

Wednesday, 02/13/18, 3:30

OSHA Excavation Standard 101 & The Rules for First Responders

James Sullivan, Prospan Shoring

This program will provide an overview of the rules contained within OSHA Excavation Standard 29 CFR 1926.650-651. This will include protective systems, how they work and what manufacturers require. Emergency response to cave-in and what you can expect from First Responders will also be discussed. First Responders are bound by the very same rules as those in construction. Their actions, or lack thereof, may very well surprise you.

Planning

Wednesday, 02/13/19, 9:00

Intensification: When does it make cents or sense? A tale of three case studies.

Matt Sokolowski, Engineer, Carollo Engineers, Inc.

Lindsey Busch, Project Manager, Carollo Engineers, Inc.

Every year technology shrinks the world, allowing us to cram more capacity and functionality into smaller devices. The wastewater treatment industry is no different. New technologies allow us to intensify treatment, accomplishing higher performance within the existing footprint of an aeration basin or clarifier. However, like any new technology, there are both advantages and disadvantages. This presentation will review case studies of different intensification technologies and will discuss the specific advantages (when compared to conventional treatment) that led each agency to pursue or not pursue intensification. Will intensification make sense for your next facility upgrade?

Wednesday, 02/13/19, 9:30

Selection of the appropriate SBR process within existing site constraints

Todd Peek, Water Infrastructure Services Manager - Illinois, Thouvenot, Wade & Moerchen, Inc.

Chris Bergmann, Water Infrastructure Services Leader, Thouvenot, Wade & Moerchen, Inc.

Ensuring that treatment plants are continuing to meet evolving effluent standards can be challenging and costly. Upgrades must not only consider current and future limits but must also ensure continuity of operations throughout construction. The selection of a treatment process that provides proper treatment while being seamlessly incorporated into the existing plant confines requires significant planning. TWM will present case studies for various plants in which SBR technology was used to meet these effluent limits. Each plant presented unique challenges and involved some variation on the technology, ensuring operator comfort with maintenance requirements and allowing continued operation during construction.

Wednesday, 02/13/19, 10:30

BAF vs. CAS: An Evaluation of Biological Aerated Filtration

Kelly Lockerbie, Civil Engineer, Greeley and Hansen

The Evansville Water & Sewer Utility's (EWSU) West WWTP utilizes a unique combination of conventional activated sludge (CAS) and biological aerated filtration (BAF) for secondary treatment. BAF replaces aeration tanks and final settling tanks used in CAS, and contains the entire secondary treatment process within a single, compact structure using media-filled cells for treatment. Per EWSU's consent decree requirement which increases future peak influent capacity,

an analysis was performed to evaluate the options of expanding the BAF and/or CAS system. Due to smaller relative footprint and increased loading capacity, BAF was selected for the expansion, saving millions for EWSU.

Wednesday, 02/13/19, 11:00

Odor Control Studies at Egan and O'Brien Water Reclamation Plants

Eric Compton, Environmental Engineer, CDM Smith

Brent Bedell, Senior Mechanical Engineer, Metropolitan Water Reclamation District of Greater Chicago

Odor control studies at the Metropolitan Water Reclamation District Egan and O'Brien Water Reclamation Plants are being completed - including conceptual design of odor treatment facilities. Successful odor control requires an approach that considers containment, conveyance, and treatment. To address the broader aspects of odor control, an overall project approach was developed that included multiple phases and considerations. The primary goal of the project is to reduce odors at the two plants by focusing on known offensive areas/processes, employing technologically proven, cost-effective, and maintenance and operation friendly odor treatment/minimization approaches.

Wednesday, 02/13/19, 11:30

BioWin modeling to Develop BNR Process Configuration to meet NPDES Permit

Bulbul Ahmed, Environmental Engineer/Scientist, Stanley Consultants, Inc.

In general, the BioWin simulator is widely used to model wastewater treatment options involving physical, chemical and biological processes. BioWin is an excellent simulation tool for comparing secondary treatment options and modeling nutrient (N, P) removal efficiency of biological nutrient removal (BNR) processes. BioWin was used to develop BNR process configuration for a wastewater resource recovery facility (WRRF) expansion project challenged with limited infrastructure and capital availability. This presentation will discuss how BioWin was used to finalize the process configuration and reactor size. Additionally, steady-state simulation results for the final design will be presented.

Wednesday, 02/13/19, 9:00

Illinois Water Quality Standards Update

Scott Twait, Illinois Water Quality Standards Update, Illinois EPA

Scott Twait is an Environmental Protection Engineer with IEPA's Water Quality Standards Unit. Scott will be providing an update on water quality standards development in Illinois and will be available for questions and discussion.

Watershed 1

Wednesday, 02/13/19, 10:30

Illinois NonPoint Source Program Update

Chris Davis, Illinois NonPoint Source Program Update, Illinois EPA

Chris is a project manager in IEPA's Nonpoint Source Unit and will provide an update on watershed management and nonpoint source program initiatives throughout the state.

Wednesday, 02/13/19, 11:00

Illinois TMDL Program Update

Abel Haile, Illinois TMDL Program Update, Illinois EPA

Abel is the Supervisor of IEPA's Watershed Management Planning Unit and will provide an update on IEPA's TMDL development process, initiative and progress.

Wednesday, 02/13/19, 11:30

Chloride Variance: Time-Limited Water Quality Standard Update

Lindsay Birt, Assistant Project Manager/Project Engineer II, Huff & Huff, a Subsidiary of GZA

Wednesday, 02/13/19, 1:00

Illinois EPA Permits Section Update

Brant Fleming, Illinois EPA Permits Section Update, Illinois EPA

Brant of IEPA Permits Section will provide an overview of Illinois wastewater permitting status, challenges, comment issues, backlog and future plans.

Wednesday, 02/13/19, 1:30

Illinois MS4 Permit Implementation Round Table

Dan Bounds, Illinois MS4 Permit Implementation Round Table, Baxter and Woodman

Dan will facilitate a round table discussion on Municipal Separate Storm Sewer System (MS4) program implementation in Illinois. Audit results will be presented. MS4 program managers will be available for questions and discussion.

Wednesday, 02/13/19, 2:00

Active Watershed Groups in Illinois

Maggie S Yarnold, Bureau of Water – IEPA

Wednesday, 02/13/19, 2:30

Watershed Implementation: Streambank Restoration 2.0 (Ted Talk)

Stephen McCracken, DuPage River Salt Creek Workgroup

Wednesday, 02/13/19, 3:30

Nutrient Assessment Reduction Plan (NARP) Update Panel Discussion

Cindy Skrukurd, Sierra Club

Wednesday, 02/13/19, 4:00

Watershed Management Open Forum (Q&A)