

Agenda

NPDES Permitting

P. Hoover

Clean Water Act
NPDES permitting regulations and process
Waterbody use and status
Technology-based effluent limit guidelines (TEGLs)
Water quality-based effluent limits (WQBELs)
Whole effluent toxicity (WET)
Water-body and site-specific option
Updates
Nutrients
Waters of the United States (WOTUS)

Wastewater Treatment Unit Processes and Operations

P. Pezeshk,
P. Marotta,
I. Takács

Biological Nutrient Removal (BNR)
Chemistry/biology overview
Suspended growth treatment
Aerobic biological treatment
Nitrification/denitrification
Biological phosphorous removal
Microbial growth and kinetics
Experimental methods in wastewater treatment
Wastewater characterization parameters
Introduction to standard methods
Application of computer models in wastewater treatment
SUMO model setup demonstration
Activated sludge model 1 (ASM1)
State variables
Biological processes
Gujer matrix representation
Setting up model's ordinary differential equations
Solving techniques (for steady and dynamic simulations)
Diffused and surface aeration models
Treatment plant hydraulics modeling
CSTRs-in-series setup
Residence time distribution (RTD): CSTR & PF
Temperature modeling of activated sludge tanks
van der Graaf temperature model (simple)
Talati & Stenstrom temperature model (complete)
Secondary clarification modeling
Takács double exponential settling velocity model
1D layered secondary settling model
Introduction to visual basics for applications
Small group activity: setting up a simple model

Biological Wastewater Treatment Modeling and Simulation

Nashville, TN - Wednesday, May 22, 2019



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Learning Objectives

You'll be able to:

Explore NPDES permitting and development of limits based on technology and water quality.

Review the chemistry of wastewater treatment and how it applies to biological wastewater treatment.

Understand biological nutrient removal, including nitrification/denitrification and phosphorus removal.

Learn about different modeling software that can be used in wastewater treatment such as the activated sludge model and diffused and surface aeration models.



Biological Wastewater Treatment Modeling and Simulation

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Learn about the NPDES permitting process and updates

Discuss wastewater treatment processes and operations including biological nutrient removal

Explore experimental methods for wastewater treatment

Understand how to use computer models in wastewater treatment

Utilize case studies and small group activities to enhance understanding of wastewater treatment methods

Continuing Education Credits

Professional Engineers

7.0 HSW PDHs

Wastewater Operators

7.0 Continuing Ed. Hours



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Faculty

Pam Hoover, P.E. *AquAeTer, Inc., Brentwood*

Ms. Hoover's work experience has included a wide range of projects including due diligence for property transfers, permitting activities, site assessments, and site closures for industrial clients. Her experience includes wastewater, stormwater, and indirect discharge permitting for small to large industrial firms, such as inorganic chemical, pulp and paper, wood treating, coal mining, and compressed gas facilities. She is a member of the Tennessee Department of Environment and Conservation's Harmful Algal Bloom Working Group. In addition to working at AquAeTer, Ms. Hoover is a doctoral student in the Civil and Environmental Engineering Department at Vanderbilt University located in Nashville, Tennessee. Her research interest is in the development of resilient community systems. In particular, her research involves assessing the relationship between weather, water quality, and water treatment processes to inform decision making by water treatment utility management. Previously, she earned a B.S degree in Environmental Science and an M.S. degree in Environmental and Water Resource Engineering from Vanderbilt.

Parsa Pezeshk, Ph.D. *Civil & Environmental Consultants, Inc., Franklin*

Mr. Pezeshk is a project engineer at Civil & Environmental Consultants, Inc. and an adjunct faculty member at Tennessee State University. He earned his Ph.D. degree in Environmental Engineering from the University of Memphis in 2015. His current work involves modeling, simulation, and optimization of wastewater treatment systems. Prior to working as an environmental engineer consultant, Mr. Pezeshk served as a natural gas pipeline inspector with the State of Tennessee. His experience also includes laboratory experimentation and pilot-plant operation of wastewater treatment systems.

Seminar Information

Scarritt-Bennett Center

1027 18th Avenue South
Nashville, TN 37212
(615) 340-7500

Tuition

\$289 for individual registration
\$269 for three or more registrations.

Included with your registration: Complimentary continental breakfast and printed seminar manual.

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Paul Marotta, Ph.D. *AquAeTer, Inc., Brentwood*

Dr. Marotta is in charge of technical aspects of wastewater and air quality projects for AquAeTer. He provides a broad range of expertise in mechanical, nuclear, industrial and environmental engineering. His environmental experience includes facility and corporate-level environmental compliance responsibilities. Dr. Marotta currently directs design and mathematical modeling for air, water, wastewater, soils, and groundwater treatment projects. His nuclear experience includes thermal design and performance analysis for the naval reactors (RSPA), design and installation of emergency fill systems, reactor vessel brittle fracture prevention analysis and new reactor prototype concept development. These areas required extensive computer modeling using complex dynamic simulations and three-dimensional finite element analysis. Dr. Marotta has successfully facilitated high performance work teams within an established unionized manufacturing environment. His industrial experience includes several positions within pulp and paper manufacturing, with management expertise ranging from large capital projects, to plant manager, to technical consultant. Dr. Marotta is an adjunct assistant professor and teaches graduate level Heat Transfer and Thermodynamics at the University of Tennessee Space Institute.

Dr. Imre Takács *Dynamita, France*

Dr. Takács, born Hungarian, naturalized Canadian, living in France, has done a similar circle in wastewater process modeling. As principal developer of GPS-X, BioWin and in the past eight years his own new Sumo process simulator at Dynamita, he has close to 40 years of experience in process modeling. Dr. Takács' interests are widespread from nutrient removal and recovery to phase separation, main and sidestream treatment and energy-efficient technologies. He will lead the group through the development of a virtual wastewater treatment plant from BOD removal to nutrient recovery using the Sumo process simulator.

Additional Learning

Webinar Series

Soil Engineering

- **Introduction to Soil Engineering**
Thurs., April 25, 2019, 11:00 AM - 12:30 PM CDT
- **Design of Excavation Support Systems**
Thurs., April 25, 2019, 1:00 - 2:30 PM CDT
- **Slope Repair Techniques**
Fri., April 26, 2019, 11:00 AM - 12:30 PM CDT
- **Soil Engineering after College: Practical Approaches to Foundations and Retaining Structures**
Fri., April 26, 2019, 1:00 - 2:30 PM CDT

For more information visit:
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Registration

Biological Wastewater Treatment Modeling and Simulation

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