New England Water Environment Association

ABSTRACTS
For the
ANNUAL CONFERENCE

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Boston, Massachusetts

January 24-27, 2010
replacing the effluent disinfection system. The existing sodium hypochlorite disinfection and sodium bisulfite dechlorination systems were replaced with an ultraviolet (UV) disinfection system capable of treating up to 60 mgd. The UV system became operational in August 2008 and is nearing completion of its first full year of operation.

“A Unique Approach to Odor and Dust Mitigation Associated with a Biosolids Management Facility, Concord, NH”
Parviz Amirhor, Michael Hanscom, Peter DeFronzo, Denise Marsh
Speaker: Parviz Amirhor, Fay, Spofford & Thorndike, LLC
This presentation summarizes the results of the evaluation, design, construction and operation of facilities to control odor and lime dust emissions associated with the sludge dewatering and stabilization process at the Hall Street Wastewater Treatment Plant in Concord, New Hampshire.

“UMass Amherst/Springfield Regional Wastewater Treatment Facility Partnership to Decrease Nitrogen Discharges to the Connecticut River”
Pamela Westgate, Kirsten Studer, Safina Singh, Sarina Ergas, Doug Borgatti, Mickey Nowak
Speaker: Pamela Westgate, University of Massachusetts
UMass Amherst graduate students teamed up with SRWTF staff to evaluate alternatives for meeting future N discharge limits. BioWin provided a good fit to facility data after calibration. Process upgrades evaluated included MLE and 4-Stage Bardenpho with and without IFAS. The MLE process could achieve an annual average total N limit of 5 mg/L at 100% of permitted capacity (67 MGD) within existing tank volume at the lowest cost.

“Adaptive Management in the Blackstone River Basin using a Dynamic Water Quality Model”
Jeffrey Walker, Paula Sturdevant Rees, Thomas Walsh
Speaker: Jeffrey Walker, CDM
Faced with potentially more stringent permit limits, the Upper Blackstone Water Pollution Abatement District (UBWPAD) embarked on a multi-year study of the water quality dynamics of the Blackstone River in central Massachusetts which included water quality monitoring and transient water quality simulation modeling. This presentation will provide an overview of the study and will focus on how a dynamic water quality model can be used to promote various watershed management alternatives.
Shawn Dent, Kirk Westphal
Speaker: Shawn Dent, CDM
This paper will explore the current state of the industry regarding modeling and decision support tools for analysis of infrastructure in the growing water-energy nexus. Off-the-shelf software, such as the Water Evaluation and Planning System (WEAP) and Long range Energy Alternatives Planning System (LEAP), both by the Stockholm Environmental Institute (SEI) will be investigated. Custom software used specifically for water resource and energy planning and management will also be compared.

“Sustainable Energy Management Systems for Wastewater Treatment Facilities”
James McCaughey, Narragansett Bay Commission
Wastewater treatment facility (WWTF) operations are often the most energy intensive service provided for within a community and because many of these facilities were designed and constructed at a time when energy consumption was not of primary concern, tremendous opportunities exist for WWTFs to improve upon existing energy management practices and procedures. Utilizing a Sustainable Energy Management System approach a group of WWTFs in Rhode Island are working together to identify and address energy improvement opportunities.

“Energy Solutions for Municipal Wastewater Treatment”
Hank Ouimet, Steve Wiehe
Speaker: Hank Ouimet, Weston & Sampson
An overview of energy efficiency and on-site renewable energy opportunities at wastewater treatment facilities. Challenges and opportunities associated with designing, building, operating, and maintaining sustainable and energy-efficient treatment facilities. Technical and economic merits of a number of viable on-site renewable energy technologies including solar PV, geothermal, thermal recovery, wind power, and hydropower. Framework for planning and implementation. Case studies in New England.

SESSION 30
PLANT OPERATIONS IV - PLANT OPERATIONS POTPOURRI

“One Year of Operation of Brockton WWTF’s 60-mgd UV Disinfection System”
William McConnell, David Norton
Speaker: William McConnell, CDM
The Brockton Wastewater Treatment Facility (WWTF) recently completed an $80 million, three-phase capital improvement program. A key component of the improvements was
SESSION 1
YOUNG PROFESSIONALS ENVIRONMENTAL CAREER PROGRESSION

“Expectations of the Graduate Entering the Professional World - From the Perspective of the Civil Engineering Consultant”
David Partridge, Tighe & Bond

This presentation provides insight to students as to what is expected of them from the perspective of engineering employers as they move from student life to becoming a productive member of the engineering workforce.

“Mentoring and Engineering”
T. Kate Mignone, AECOM

Mentors and mentoring younger staff is important for any profession, but it is especially important in civil engineering. This paper will present a number of personal observations on the mentoring process, from one who has been the recipient of mentoring, and who is now transitioning to the position of starting to mentor junior staff. The focus will be on what worked and what some of the issues were in fostering a mutually-beneficial mentoring relationship.

SESSION 2
PLANT OPERATIONS I – PHOSPHORUS REMOVAL (AND MORE)

“Achieving an Effluent Total Phosphorous Limit of 0.1 mg/l: Hudson's Dissolved Air Flotation Tertiary Phosphorous Removal Process Comes Online”
Jason Jancaitis, Kevin Olson, William (Doug) Hankins, Edward Leonard

Speaker: Jason Jancaitis, Wright-Pierce

The Town of Hudson, Massachusetts completed an upgrade to their wastewater treatment facility in September 2009. The centerpiece of this project is a new tertiary phosphorous removal process, to allow the Town to meet its NPDES permit limit of 0.1 mg/l TP. A dissolved air flotation (DAF) process was selected for the tertiary treatment process, believed to be the first such wastewater application in the United States. This presentation will focus on the construction, start-up and operation of the dissolved air flotation process.

“Pilot Testing for Low-Level Phosphorus Removal: Confronting Non-reactive Phosphorus Challenges”
Nick Tooker, Susan Guswa

Speaker: Nick Tooker, Tighe & Bond

To verify ability to achieve an effluent total phosphorus limit of 0.1 mg/L, a pilot test was conducted on four low-level phosphorus removal technologies at the North Attleborough

“Powering Up Nashua’s Wet Weather Flow Treatment Facility (WWFTF) -- This Generator is No Stand-by Act”
Stephen Perry, Jennifer Lachmayr, William Casey, Patrick Daigle

Speaker: Stephen Perry, Malcolm Pirnie, Inc.

In depth look at the cost effective analysis and cooperation between the PSNH (power company), NH DES (regulatory entity), and the City of Nashua that lead to the decision and allowed for the use of a 1500kW diesel generator to be designated as the primary power source for the newly constructed Wet Weather Flow Treatment Facility.

“Togus VA Medical Center Achieving Multi-Stakeholder Consensus and DEP Compliance: Force Main and Pump Station Connection to the Greater Augusta Utility District”
Mike Stein, Woodard & Curran

The Togus VA Medical Center’s wastewater treatment plant (WWTP) in Augusta, Maine discharges its effluent flow to Togus Stream and mitigation attempts have not been successful. The Maine Department of Environmental Protection (MEDEP), informed the Togus VA that the renewal of an existing NPHES permit would result in stricter effluent limits for the medical center’s WWTP. This session will discuss the project while pointing out lessons learned and economic and environmental benefits.

“The EPA, Climate Change, and Public Works”
Ray Sirois, Wright-Pierce

This session will review what the EPA is saying and doing with regards to climate change and water management. Specifically, we will focus on two EPA publications: The State of Knowledge on Climate Change on EPA.gov, and the EPA’s National Water Program - Response to Climate Change. While these documents do not yet lay out any new regulations that pertain to water, wastewater, utility management, there are a number of strategies which are being advocated for public works planners and engineers. We will review those, and the specific action steps which the EPA is doing to respond to climate change science. This will help infrastructure planners prepare for changes in regulation which are likely to be coming, and changes in climate which are already here.

SESSION 29
SPECIAL JOINT SESSION IN ENERGY AND SUSTAINABILITY

“Comparing Greenhouse Gas Emissions from Different Solids Management Scenarios”
Ned Beecher, Andrew Carpenter

Speaker: Ned Beecher, NEBRA

This presentation will focus on a new bottom-up model for estimating greenhouse gas emissions from various biosolids management processes, allowing for apples-to-apples comparisons of different options.
“Generating Electricity from Waste at a WWTP in Pittsfield, MA”

Joan Fontaine, S E A Consultants Inc.

The City of Pittsfield has determined that it can reduce its annual electrical draw from the utility by 30% through the combustion of anaerobic digester gas in a combined heat and power system. Electricity generated by the system will be used to operate plant equipment while waste heat will be used to heat sludge in the anaerobic digesters. An estimated $200,000 will be saved annually.

“How Biological Phosphorus Removal Can be Inhibited by Collection System Corrosion and Odor Control Practices”

Edmund Kobylinski, Black & Veatch

Speaker: Edmund Kobylinski, Black & Veatch

The key to successful Biological Phosphorus Removal (BPR) is influent wastewater quality. BPR needs volatile fatty acids (VFA) or sufficient rapidly biodegradable COD in the influent to trigger the phosphorus release mechanism. Corrosion and odor control in the collection system, which hinder VFA production or destroy VFA, can have an adverse impact on the BPR process. In most municipalities, the wastewater treatment plant (WWTP) and the collection system are divided into two separate autonomous departments within the City government, so collection system activities can have unforeseen consequences at the WWTP. In facilities that have strict phosphorus limits, there is an increased need to coordinate collection system activities with treatment plant operation to ensure continued compliance with the permit.

“Tailored Approaches to Minimize Nutrient Removal Costs”

William Hankins, Wright-Pierce

The desire to reduce nutrients in the effluent of our wastewater treatment plants has and will continue to result in ever increasing costs to our local municipalities. In an effort to keep the ever growing costs to a minimum our solutions to these problems need to be tailored for each wastewater plant. Through innovative solutions, which incorporate our past investments in existing infrastructure, we can meet these new challenges while reducing the economic impacts of meeting increasingly stringent discharge standards.
clusters 20 single family homes on residential lots (0.20-acres in size) and preserves 74% of the 38-acre site as undeveloped open space. LID techniques include dry wells, vegetated swales, bioretention and reduced impervious area. The objective of the project is to understand the storm water runoff dynamics through monitoring at the LID Subdivision and Pre-development Watershed and compare them to a Cluster Only and Conventional Subdivisions, via modeling. The LID Subdivision and Pre-development Watershed were monitored to determine the runoff volume during different size storm events, for use in model development and calibration. Based on four modeled scenarios (LID, Cluster Only, Conventional and Pre-development) it appears that the LID Subdivision provides the greatest reduction in storm water runoff volumes when compared to the Cluster Only and Conventional Subdivisions. The Cluster Only Subdivision runoff volumes were greater when compared to the LID Subdivision; however, when compared to the Conventional Subdivision, it appears that a clustered design layout has the greatest single effect on reduction of storm water volume. The modeled LID, Cluster Only and Conventional Subdivisions runoff volumes were compared to the Pre-development Watershed model, and results indicate that the LID Subdivision most closely resembles the Pre-development Watershed. As design storm increases, it appears that the LID and Cluster Only Subdivision more closely mimic the Pre-development Watershed condition.

“Groundwater Impacts of Stormwater Infiltration: Considerations for Low Impact Development and Proposed MA Stormwater Regulations”
Matthew Gamache, Scott Coffey, Mark Maimone, Kristina Masterson
Speaker: Matthew Gamache, CDM

Proposed new MA DEP stormwater management regulations and other low impact development initiatives seek to supplement groundwater recharge with stormwater infiltration to help maintain stream base flows. In some cases, little attention is paid to potential groundwater impacts of enhanced stormwater infiltration. This paper presents cases where groundwater impacts were a concern and groundwater modeling studies were conducted to address the concerns.

“Hydrologic and Hydraulic Modeling for Green Stormwater Practices”
Sandeep Mehrotra, Jim Garin, Dana Gumb, Brian Henn
Speaker: Sandeep Mehrotra, Hazen and Sawyer, PC

Effective stormwater management design requires consideration of not just the traditional piped drainage network but also of the receiving waters and the interface that joins the two. This paper demonstrates that the U.S. Army Corps of Engineers Hydrologic Engineering Center’s widely used hydrologic (HEC-HMS) and hydraulic (HEC-RAS) models can provide a flexible and robust method of conceptualizing an urbanized, tidally-influenced watershed. Additionally, the models can simulate the impact of Best Management Practices (BMPs) on the watershed flood response and guide the design of BMPs.

SESSION 25
INDUSTRIAL WASTEWATER

“Pharmaceutical Manufacturing Waste – Impacts on Local Sewer Collection and Treatment Systems”
Wayne Bates, Christopher Walton
Speaker: Wayne Bates, Capaccio Environmental Engineering, Inc.

Wet operations from life science or biotechnology firms could potentially place a burden on the water and sewer infrastructure if a community is not prepared. The purpose of this presentation is to 1) provide a general overview of the biotechnology and life sciences industry sector, 2) discuss wastewater characteristics for this industry sector, and 3) outline the potential impacts these waste streams may have on local sewer collection and treatment systems, especially in small communities.

“Cost Implications of Removing Total Organic Carbon and Contaminants of Emerging Concern from Treated Water Recharged to a Groundwater Supply Area: Technology Review and Massachusetts Case Studies”
Speaker: Alyson Watson and Nathan Weeks, GHD

The recently revised Massachusetts Groundwater Discharge Permit Program includes a new total organic carbon (TOC) limit of 3.0 mg/L for recharge into a Zone II Area with groundwater travel times greater than 2 years. This paper summarizes treatment technologies capable of achieving the new TOC limitation in terms of cost and ability to remove both TOC and contaminants of emerging concern (CECs). Several Cape Cod communities are highlighted as case studies.

SESSION 26
ENERGY II – SUPPLY SIDE/RENEWABLE ENERGY

“Direct Field Measurement of Water Source Heat Pump Efficiency”
David Kyle, Timothy LeVasseur, Frank McVey
Speaker: Timothy LeVasseur, Kennebec Sanitary Treatment District

A small but growing number of wastewater facilities are installing water-source heat pumps to provide space heating, using plant effluent as the heat source. This presentation provides a detailed analysis of actual time-dependent field data gathered from one heat pump installation. Conclusions concerning energy savings, dollar savings and environmental benefits will be presented.
“Old Pipe/Renewed Pipe – How New Technology Enhanced the Rehabilitation of a One Hundred and Forty-Year-Old Sewer”  
Charles Wilson, Frank Ayotte, Edward Duggan  
Speaker: Charles Wilson, Hazen and Sawyer, PC

The Boston Water and Sewer Commission owns and maintains wastewater, drainage, and combined sewer systems that includes some of the oldest infrastructure in the country. One project that will help reduce annual CSOs to Boston Harbor, includes the rehabilitation of a section of the Dorchester Brook Sewer, one of its oldest and largest sewers. Spiral-wound lining, a relatively new technology to the U.S., provides a unique solution that maximizes system hydraulics and solves structural problems.

SESSION 24  
INNOVATIVE APPROACHES TO WETLAND AND STREAM RESTORATION

“Creating Wetlands and a Unique Public/Private Collaboration in Milford, CT”  
Gary Sorge, Stantec

This wetlands project restored a city park in Milford, CT with a natural amenity, a more diverse ecology, a restored floodplain, and nearly 6 acres of new meadow wetland and buffer area. At the same time, it established a unique partnership between the city and a local utility to work together to improve the city’s infrastructure in an environmentally responsible manner.

“Navigating the First Steps in a Stream Restoration – The Holly Pond Project”  
Erin Mosley, Jeanette Brown  
Speaker: Erin Mosley, CH2M HILL

The City of Stamford has developed a flexible, phased project approach to manage shoaling in Holly Pond and address long standing aesthetic and aquatic habitat concerns. In the first phase, the WPCA and CH2M HILL used historical research and field efforts to study and evaluate the sources, characteristics, and quantities of sediment that enter the river and pond. This presentation describes the results of these investigations and will discuss the future of the project.

“Narragansett Bay Commission’s Stormwater Management Program”  
John Zuba, Stephen Lallo, Kimberly Kirwan,  
Speaker: John Zuba, Narragansett Bay Commission

In 2003, the NBC instituted a Stormwater Mitigation Program to reduce the discharge of stormwater into the Narragansett Bay Commission’s sanitary sewage system. The program objective of reducing stormwater discharges to the collection system is achieved by requiring developers and building contractors in the NBC district to develop Stormwater Management Plans and implement plan findings. Results of significantly reduced stormwater flows to the NBC collection system and receiving waters will be presented.

SESSION 4  
ASSET MANAGEMENT I - CONDITION ASSESSMENT

“A Pragmatic Approach to Desktop Condition Assessment for Water Distribution System Ferrous Pipes”  
Gage Muckleroy, Mert Muftugil, Shiv Iyer  
Speaker: Gage Muckleroy, Stearns & Wheler GHD

Stearns Wheler GHD is currently developing an asset management plan (AMP) for Washington Suburban Sanitary Commission’s water distribution system (WDS). A critical component of the AMP development process is to identify when to make a specific type of investment to a specific asset (i.e. a water main). To estimate deterioration of water main condition over time, a model is being tested and piloted for the ferrous pipes in the WDS. The condition assessment model has two primary components, one based on work order histories while the other is based on soil characteristics.

“BEM Condition Assessment of Ferrous Pipelines Including Ductile Iron Force Mains”  
Robert Kerry, William Di Tullio, Michael Sweet  
Speaker: Robert Kerry, InfraMetrix, LLC

Ferrous sanitary sewer force mains are critical components of a collection system. However, it has remained a challenge to perform cost effective condition assessments on these pipelines. Broadband Electromagnetic (BEM) Technology has shown promise as an effective, non-destructive technique to obtain an initial assessment of a force main’s condition. BEM is a frequency independent eddy current (EC) tool well suited to penetrate through coatings, linings, and insulation to gauge the thickness of the metal and to evaluate metallurgical changes such as graphitization.
“Sodium Hypochlorite Storage Area Rehabilitation”
Kevin Krawiec, Thomas Sgroi

Speaker: Kevin Krawiec, Corrosion Probe, Inc.

Structural deterioration of a reinforced concrete floor slab occurred due to chloride corrosion from leaking hypochlorite. An investigation was performed to identify the extent and severity of deterioration, and a design prepared to rehabilitate the area to assure long-term structural and containment integrity. The first phase of rehabilitation is complete, and the second is due for completion by the end of 2009.

“Asset Management Starts with Initial Equipment Specifications”
Gary Arthur, Alan Taubert, Dudley Smith

Speaker: Gary Arthur, An-Cor DKG

Establishing favorable Potential Failure – Failure Curves on startup is an obvious goal, lowest costs are incurred. Owner, Consultant and Manufacturer experiences will be shared, showing how to optimize the Curve for FRP chemical feed tanks and odor control systems. Case histories demonstrate causes of failure and successful installations. Condition assessment and monitoring criteria provided help create benchmarking, life cycle planning and replacement strategies for new installations and RCM programs. Safer and environmentally friendly operations result.

SESSION 5
CSO/WET WEATHER ISSUES I – PLANNING AND DESIGN

“Understanding Corrosion Protection/Prevention Needs in CSO and Sewerage Conveyance Tunnel Design”
Robert A. (Randy) Nixon, Corrosion Probe, Inc.

This presentation will focus on lessons learned concerning biogenic sulfide corrosion from inspecting existing CSO and conveyance tunnels over several years in wastewater collection systems. The speaker will discuss and show improved drop shaft design methods, corrosion patterns based on tunnel turbulent zones and airflow conditions, and present recommendations for protective linings for various tunnel operating conditions. Additionally, the presentation will compare the use of the 1992 EPA Corrosion Prediction Model to actual field measured corrosion rates in sewer tunnels. Finally, recommended design considerations will be presented for CSO and conveyance tunnels in the future.

SESSION 23
COLLECTION SYSTEMS III – TRENCHLESS PIPELINE REHABILITATION AND REPLACEMENT

“Threading the Needle: Design and Installation of a 72" CSO Gravity Sewer by Soft Ground Microtunneling”
Brian Canterbury, Alan Pelletier, James Sullivan, William Bent

Speaker: Brian Canterbury, AECOM

This paper presents the design and construction challenges of the Homestead Avenue Interceptor Extension (HAIE) project in downtown Hartford, Connecticut as part of the Hartford Metropolitan District Commission’s $1.5 billion Clean Water Program. The 72-inch CSO sewer is designed to remove sanitary flow from an existing drainage conduit and provide CSO control up to the 1 year storm. The HAIE is being installed using a combination of microtunneling, jack and bore and open-cut techniques.

“Shield Mining Proves Best Solution to Replacing Sewer under Busy Transportation Corridor”
Edward Duggan, John Burckardt, Henry Russell, Christopher Barnett

Speaker: Edward Duggan, Boston Water & Sewer Commission

The Boston Water and Sewer Commission owns and maintains a wastewater, drainage, and combined sewer system that includes some of the oldest infrastructure in the country. A 120-year-old sewer in need of replacement is now located underneath an interstate highway and multiple sets of electrified rapid transit rails and commuter railroad tracks and adjacent to a recreational area. Hand tunneling with a jacking shield provides the method for installing the replacement sewer.

“The Underground Story to Trenchless Technology on an Island”
Karla King, Thomas Parece

Speaker: Karla King, AECOM

This project included the replacement of the existing wastewater infrastructure in the Downtown Area of Nantucket consisting of the replacement of approximately 7,200 linear feet of existing A.C. and V.C. gravity sewer with 8-inch and 10-inch PVC and HDPE gravity sewer and appurtenances via open cut trench excavation (2600 linear feet) and pipe bursting (4600 linear feet). Discussions will focus around the benefits, challenges, and opportunities for utilizing pipe bursting to replace sewer lines.
“An Evaluation of Nutrient Loading to Upper Narragansett Bay”
Catherine Walker, Thomas Uva, Catherine Walker, Christine Comeau

Speaker: Catherine Walker and Christine Comeau, Narragansett Bay Commission

Understanding nutrient loads to upper Narragansett Bay is crucial to developing cost-effective policies that improve water quality and avoid huge investments with minimal environmental gains. The Narragansett Bay Commission will present monitoring data from its wastewater treatment facilities, one of which is currently removing nitrogen, as well as data collected from local rivers used to estimate overall loading to the Upper Bay and nutrient monitoring data collected from the Providence and Seekonk River estuaries.

“Phosphorus Treatment – Advanced Removal Mechanisms and Amended Design for Stormwater BMPs”
Scott Perry, Joel Garbon, Brian Lee

Speaker: Scott Perry, Imbrium Systems

It has been well-documented that continued land development through urbanization is deteriorating surface water quality. One significant concern with our limited global fresh water resources is the onset of toxic algae blooms and reduced dissolved oxygen due to continued, uncontrolled phosphorus loading. This is leading to negative ecologic, economic, and human health impacts. As a result, regulators are beginning to acknowledge the impairment of fresh water bodies, and have begun implementation of Total Maximum Daily Loads (TMDLs). However, applying phosphorus related TMDLs specifically to stormwater runoff may not be effective without first understanding the available mechanisms and limitations involved in phosphorus treatment for stormwater applications. To understand how to achieve continued, high levels of permanent phosphorus removal, this paper reviews the transport and fate of Total Phosphorus, including both particulate-bound and dissolved phosphorus, in urban stormwater runoff. The advantages and disadvantages of removal mechanisms employed in both conventional Best Management Practices (BMPs) and newer Low Impact Development (LID) applications are discussed. Advances in phosphorus treatment technology have recently become available, providing the ability to capture high levels of both particulate-bound and dissolved phosphorus. Understanding the functional removal mechanisms and how to sustain high treatment levels are critical to protecting our water bodies. Amending both conventional BMPs and LID applications with new advanced phosphorus treatment provides a solution to achieve existing and future TMDLs. These concepts and amendments are discussed as a potential means to raise the performance bar for phosphorus treatment and implement practices that protect our fresh water resources.

“Hydraulic Modeling and Design of the Narragansett Bay Commission’s CSO Control Program – Phase II”
Karen Rendall, Thomas Brueckner

Speaker: Karen Rendall, CH2M HILL

Hydraulic modeling was used to support the design of two CSO interceptors that will collect CSO from the Woonasquatucket and Seekonk River basins and convey the CSO to the NBC’s deep tunnel storage system. This presentation will provide an overview of the NBC’s CSO Control Program and will describe the use of DHI’s MIKE URBAN model in developing the final design of the CSO interceptors.

“Design of Tidal Influenced Outfalls in South Boston: Energy Dissipation and Hydraulic Simulation”
Dingfang Liu, Melissa Recos, Edward Duggan, Al Carrier

Speaker: Dingfang Liu, Tetra Tech Rizzo

South Boston Reserved Channel sewer separation requires additional hydraulic capacity for two of the four outfalls. With projected 270 CFS peak flow during the 10-year design storm, energy dissipation structures were proposed to avoid excess scour of mud flat area during the storms at low tide. Alternatives considered include in-line slotted roughness element chamber, USBR type VI impact basin, rigid boundary basin and riprap basin and apron. A combination of riprap apron and rigid boundary basin was selected as the optimum design option. Stream bed and bank scour analyses were performed to size the riprap stone.

“Illicit Discharge Detection & Elimination -- Don't Be Afraid of the Big Bad Wolf”
Speakers: Patricia Passariello, Weston & Sampson
Andrew DeSantis, City of Chelsea, MA

Based on the draft Phase 2 Stormwater Permit for NH and direction from the EPA, the minimum control measure likely to require the most effort under the new permit is Illicit Discharge Detection & Elimination (IDDE). New requirements for system mapping, outfall monitoring, and field investigation are sure to trouble us all. The goal of this presentation is to help you understand IDDE Programs and help you tackle them with the least amount of stress.

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SESSION 6
THE LONG AND SHORT OF BIOSOLIDS

“454 Pyrosequencing Identification of Bacterial Pathogens in Class A and B Biosolids, Agricultural Residuals, and Soil”
Kyle Bibby, Jordan Peccia, Emily Viau
Speaker: Kyle Bibby, Yale University

The pathogen content of wastewater residuals is poorly understood and due to the expense and complexity, comprehensive surveys of the pathogen populations present in treated sewage sludge have not been undertaken. We used a novel sequencing technology, 454 pyrosequencing, to identify bacterial pathogens present in treated sewage residuals. Identification of pathogens present in biosolids will focus the efforts of developing a risk-based approach to beneficial reuse of sewage sludge.

“Full Scale Performance Assessment of Selected Sludge Reduction Technologies and Discussion of Underlying Mechanistic Principles”
Julian Sandino, Dru Whitlock, Lauren Fillmore, John Novak
Speaker: Julian Sandino, CH2M HILL

WERF’s O5-CTS-3 Evaluation of Processes to Reduce Activated Sludge Solids Generation and Disposal, seeks to establish a comprehensive evaluation methodology for waste activated sludge (WAS) reduction processes. This paper focuses in the evaluation of performance and operational data from several full-scale sludge reduction facilities utilizing a variety of technologies, and discusses the underlying mechanisms behind them, identifying key factors influencing process performance under site specific application conditions.

“Pilot Testing Sludge Dewatering Equipment: The Battle of Three Technologies”
Deborah Primeau Mahoney, Robert Stallings, Ray Vermette
Speaker: Deborah Primeau Mahoney, AECOM

Selecting a major piece of equipment for a plant upgrade is no easy task especially when there are new and improved technologies fighting for market share. Such is the case in Dover, NH where the aging belt filter presses were in need of any upgrade or replacement. Based on current space availability and long term needs, the City decided on replacing the belt filter presses with a new technology. Given the current trends in the market place this situation was perfect for pilot testing three different technologies, the rotary press, screw press and centrifuge. This paper explores the battle of these three technologies through a pilot testing process to determine which equipment would be the best fit for the Dover Wastewater Treatment Facility (WWTF) sludge dewatering upgrade based on a dryer sludge cake, reduced maintenance and personnel oversight, decreased energy consumption, chemical and composting costs, and minimized product handling and transport costs.

“Innovative Reuse of Existing Wastewater Forcemain for Redundancy and Increased Capacity – Ogunquit, Maine Case Study”
Timothy Vadney, Wright-Pierce

The Ogunquit Sewer District’s second largest pump station was hydraulically limited by a 50 year old 8-inch cast iron forcemain. The existing forcemain route runs through the historic seaside area and runs beneath several existing structures, including a hotel and a bridge - effectively precluding conventional forcemain replacement by open-cut construction. Capacity was increased by directionally drilling a supplemental forcemain and the existing forcemain was sliplined and is used for additional capacity and redundancy.

SESSION 22
WATERSHED MANAGEMENT II – NON-POINT SOURCES – THE ELEPHANT IN THE WATERSHED

“A Watershed Assessment to Identify Stormwater Management Options to Address Excessive Nutrient Loading to an Impaired Waterbody”
Michelle West, Horsley Witten Group, Inc.

A watershed assessment was performed in Harvard, MA to determine the best stormwater retrofit options and locations to reduce nutrient loading to an impaired waterbody, Bare Hill Pond. Several LID techniques were designed for the site, including bioretention areas, dry swales, and gravel wetlands. This presentation will focus on the innovative design features and enhanced pollutant removal capability of the gravel wetland.

“The Economic and Environmental Value of Nonpoint Source Abatement in Large Watersheds”
Jamie Lefkowitz, Jeff Walker, Kirk Westphal, Gary Mercer
Speaker: Jamie Lefkowitz, CDM

Throughout the United States, nonpoint source pollution from stormwater runoff, failing septic tanks and other diverse sources is a significant, often dominant, cause of noncompliance with bacteria water quality standards in large watersheds. This work illustrates how abatement costs and resulting effects on instream bacteria levels for both point and nonpoint source controls must be clearly understood and managed together if the fundamental precepts and objectives of the Clean Water Act are to be addressed decisively.
of Understanding that outlined the roles and responsibilities of each party.

Due to Massachusetts DEP permit requirements, the project was required to complete a Sewer System Evaluation Survey and implement a phased rehabilitation program to remove up to 2 million gpd of infiltration and inflow under a Memorandum of Understanding. The project has been implemented by a public-private partnership between City of Malden, the Massachusetts Water Resources Authority and a private developer. The public-private partnership facilitates assessment and rehabilitation of 100+ year old collection systems. As it relates to wastewater treatment, LCA can provide a comprehensive picture of environmental impacts such as energy use, carbon footprint, greenhouse gas emissions, and related costs for a variety of material selection and facility design alternatives.

Massport has implemented a state-of-the-art computer model of the Logan International Airport drainage system. The model is used monthly to estimate runoff rates and volumes to all airport outfalls in accordance with its NPDES permit. The model has been calibrated to fall and winter conditions monitored in 2007 and 2008, as well as to long-term snow processes. It is also used for water quality analysis of deicing and anti-icing fluid runoff into Boston Harbor.

Sanitation agencies in California are adopting widespread remote monitoring of their collection systems using an integrated low cost wireless sensor network to reduce or eliminate sewer overflows and lower operating costs. This paper will discuss the experiences of Culver City, California and other sanitation agencies in California in successfully implementing widespread sewer monitoring to reduce or completely eliminate sewer spills, optimize maintenance cycles, lower monitoring costs, and improve overall system management.

Establishing a public-private partnership between City of Malden, the Massachusetts Water Resources Authority and a private developer facilitates assessment and rehabilitation of 100+ year old collection system. Due to Massachusetts DEP permit requirements, the project was required to complete a Sewer System Evaluation Survey and implement a phased rehabilitation program to remove up to 2 million gpd of infiltration and inflow under a Memorandum of Understanding that outlined the roles and responsibilities of each party.

SESSION 21
COLLECTION SYSTEMS II - MODELING, MONITORING AND EVALUATION

“A Multifaceted Modeling Approach to the Logan International Airport Drainage System”
Frances Bui, Mitchell Heineman, Keith Beasley

Massport has implemented a state-of-the-art computer model of the Logan International Airport drainage system. The model is used monthly to estimate runoff rates and volumes to all airport outfalls in accordance with its NPDES permit. The model has been calibrated to fall and winter conditions monitored in 2007 and 2008, as well as to long-term snow processes. It is also used for water quality analysis of deicing and anti-icing fluid runoff into Boston Harbor.

“California Dreamin’ – Stopping Spills and Saving Money Using an Integrated Remote Monitoring Network”
Gregory Quist, Gabe Garcia, David Drake

Sanitation agencies in California are adopting widespread remote monitoring of their collection systems using an integrated low cost wireless sensor network to reduce or eliminate sewer overflows and lower operating costs. This paper will discuss the experiences of Culver City, California and other sanitation agencies in California in successfully implementing widespread sewer monitoring to reduce or completely eliminate sewer spills, optimize maintenance cycles, lower monitoring costs, and improve overall system management.

“Public-Private Partnership Facilitates Collection System Evaluation and Rehabilitation”
Robert Button, Robert Musci

Establishing a public-private partnership between City of Malden, the Massachusetts Water Resources Authority and a private developer facilitates assessment and rehabilitation of 100+ year old collection system. Due to Massachusetts DEP permit requirements, the project was required to complete a Sewer System Evaluation Survey and implement a phased rehabilitation program to remove up to 2 million gpd of infiltration and inflow under a Memorandum of Understanding that outlined the roles and responsibilities of each party.
“LID Performance Monitoring Challenges and Results for Infiltrating BMPs: Bioretention Cells, Raingardens, and Porous Pavements”
Andrea Braga, Renee Fitsik

Speaker: Andrea Braga, Geosyntec Consultants, Inc.

Low Impact Development (LID) techniques have been implemented across the United States and internationally to allow for increased development with decreased environmental impact. The object of LID is to mimic the hydrologic cycle, to handle and infiltrate stormwater on-site and to minimize the impact of development. This presentation will discuss five sites located in Massachusetts where infiltration practices have been installed and will provide design information and performance monitoring results and challenges for each site.

SESSION 8
COLLECTION SYSTEMS I – MUNICIPAL INFRASTRUCTURE IMPROVEMENTS AND CHALLENGES

“East Framingham Sewer Improvements Project”
James Barsanti, Eric Johnson, Rob McCoy, Paul Brinkman, Paul Barden

Speaker: James Barsanti, Framingham Department of Public Works

The Town of Framingham’s Comprehensive Wastewater Management Plan recommended over $100 million in capital improvements for the wastewater collection system. The largest project is the East Framingham Sewer Improvement Project (EFSIP), which includes a new 13 mgd wastewater management facility, a parallel force main system with 6,000 feet of 18-inch and 20-inch force mains, and 17,000 feet of gravity sewer with a portion constructed within an abandoned railroad easement to be converted to a recreation trail. Total projects costs are estimated at approximately $40M.

“Millbury, MA Expands Infrastructure through $21M Sewer Project and Management Plan”
Marie Cannon, Joseph Boccadoro, J. Bradford Lange

Speaker: Marie Cannon, AECOM

From October 2005 to present (2009) Millbury has completed four sewer projects under the MA DEP SRF program totaling $21M to be financed over a 30-year period by the sewer users. The projects involved five areas of town and in total included over 10 miles of 8 and 10-inch sewer, and four pumping stations as identified in the Town’s 2002 Updated Comprehensive Wastewater Management Plan (CWMP). Each project involved unique challenges which ranged from deep ledge excavation, wetlands and buffer zone permitting, construction in state highways, contaminated soils, Dam Safety permitting, traffic control, railroad right of ways and easements on private and state-owned land. Two projects included horizontal directional drilling, one under active railroad tracks and one under an earthen dam. In March 2005, DEP notified Millbury that all four sewer projects proposed as needs areas

“Succession Planning as a Result of Loss of Personnel Due to People Leaving the Industry”
Doug McKeown, Woodard & Curran

Succession Planning is an important issue that all enterprises must deal with, whether a private businesses or a public utility throughout New England. Session attendees will learn from first hand experience what a succession plan is and why it is important. In addition, specific examples will be provided regarding what utilities can do to facilitate interest in mentorship and increased leadership responsibilities within an organization.

SESSION 20
SAFETY: KEEPING UP WITH THE CHANGING TIMES

“NBC WWTF Safety Program”
David Aucoin and John Bissonette, Narragansett Bay Commission

The Narragansett Bay Commission’s (NBC) Environmental Health and Safety (EH&S) Program is an award-winning program that effectively provides training and safety information to all its employees on a regular basis, in order to maximize protection against potential hazards within the workplace environment and at home. All safety training is conducted in accordance with applicable OSHA General Industry Regulations (29 CFR 1910) that pertain to the wastewater treatment industry.

“Age Awareness and Health and Safety Training”
Bridget McGuiness, Thomas Estabrook

Speaker: Bridget McGuiness, The New England Consortium

Health and safety training often focuses on basic elements of regulatory compliance and worker safety rather than how the work environment and organization of work impacts worker health and safety. Present rather than long-term.

“Health and Safety Concerns and Strategies of an Aging Workforce”
Bridget McGuiness, Thomas Estabrook


Health and safety training often focuses on day to day regulatory compliance rather than strategies for keeping workers healthy and safe. The training rarely examines the work environment or the organization of work for job hazards that are known to contribute to long-term workplace injury or illness. As workers age, natural changes experienced include reduced physical and sensory capabilities as well as a reduction in mental acuity. Aging workers may not have higher injury risk overall but the effects of their injuries may be more intense than those experienced by younger workers. The National Institute of Occupational Safety and Health (NIOSH) has studied the issue of health and safety and an
tions above the USEPA MCL of 70 ug/L. In-situ geochemical fixation technology was chosen to remediate the hexavalent chromium contamination in the groundwater. A 3-dimensional groundwater flow and contaminant transport model was developed and run to test multiple iterations of pilot study schemes.

SESSION 19
UTILITY MANAGEMENT I – LEADERSHIP IN UTILITY MANAGEMENT

“Your State WARN – Join BEFORE You Need It!”
Michael Knox, Johnna McKenna, Thomas Chaplik

Speakers: Michael Knox, Cherry Valley and Rochdale Water District and Johnna McKenna, NH DES

Each New England state now has its own Water and Wastewater Agency Response Network (WARN) - a mutual aid and assistance system that allows water and wastewater utilities from within each state to assist each other in the event of an emergency. Representatives from each of the New England states’ WARNs will provide updates on their WARNs and answer any questions during this session.

“Public-Private Partnership as a Creative Vehicle for Delivery of Public Water and Wastewater System Upgrades”
Hans Tuneblom, Roger Brooks

Speaker: Hans Tuneblom, Veolia Water North America - Northeast, LLC

The program for implementation of significant water and wastewater system upgrades for the City of Leominster is being managed by Veolia Water via a Public-Private Partnership (PPP). This presentation highlights the steps undertaken to implement the program and the benefits of the PPP.

“Is Wastewater Reuse Coming to the “Water Rich” Northeast?”
Richard Cisterna, Joyeeta Banerjee, Keith McHale, Michael Pacholski

Speaker: Richard Cisterna, Hazen and Sawyer, PC

The University of Connecticut is embarking on a first of its kind water reclamation project for the region. In response to an increasingly limited groundwater supply, the University is progressively venturing into the world of wastewater reuse. There plan is to sustainably utilize reclaimed wastewater for non potable applications such as irrigation and electrical co-generation plant process water including boiler and cooling tower systems. The solution is to implement a state of the art treatment process including microfiltration, reverse osmosis and ultraviolet light disinfection.

in its 2002 Updated CWMP were then eligible for SRF financing. Over the next four years, with the cooperation of Millbury town officials, its engineers and DEP, the town was able to develop a financing plan, gain Town Meeting approvals, complete sewer design and permitting, secure $21M of SRF funding and bid and construct four major sewer infrastructure projects. When completed, these projects will be incorporated into the ongoing GIS Mapping and Asset Valuation management programs.

“Be Prepared: Lift Station Power Failure Emergency Response Plan”
Brad Hayes, Michael Lukas

Speaker: Brad Hayes, City of Tavares, FL

The presentation will encompass the problems, goals and the creation of an Emergency Response Plan (ERP) that Municipalities and Utilities should be prepared to respond to all emergencies, especially wastewater collection systems, to ensure public health and to prevent polluting the environment. The time to think about an ERP is now; not after an occurrence or upon notice by a regulatory agency. ERPs can be tailored to the needs of the Utility or Municipality. ERPs are inexpensive to develop and can be one of the best resources for responding to an emergency and they are a Living Document and can be continuously updated.

“Innovative Odor Containment and Treatment at a Large Wastewater Pumping Station”
Robert Bowker, David Skibicki, Joseph T. Kotowski


The 15 mgd Woodbridge Avenue Pumping Station, with aerated grit chambers and mechanical bar screens, experienced dangerous levels of hydrogen sulfide plus odor complaints from neighbors. An innovative containment system was constructed for the influent channels and bar screens, resulting in a 75% reduction in air flow requiring treatment. The air was treated in a biotrickling filter that achieved 99% H2S reduction and over 90% odor reduction. Complaints ceased and worker safety was greatly improved.

SESSION 9
LAYING THE GROUNDWORK FOR DEVELOPMENT PROJECTS

Catherine Chomat, Bernadette Kolb

Speaker: Bernadette Kolb, CDM

To improve water quality within Lake Qarun and address public health concerns for the 2.5 million people who live around it, the USAID mission in Egypt funded a comprehensive watershed assessment study. This presentation shows the importance of coordinating small-scale efforts to end up with a successful and long-lasting overall improvement. This
presentation also highlights the tradeoffs between environmental protection and public health.

“Sanitation Issues in the Dominican Republic and Water For Peoples Response”
Robert Adamski, Gannett Fleming, Inc.
As part of the 2006-2011 Strategic Plan W4P decided to add 5 more countries to the 5 they were currently in. To decide which countries to add, W4P screened 20 countries and selected 10 for further study. The DR was one of these. The paper will describe the process used to evaluate the water, sanitation and health conditions in the DR and what the W4P Board decided.

“Mapping/Needs Assessment in Rwanda – World Water Corps”
A. Martha Fernandes, David VanHoven
Speaker: A. Martha Fernandes, MWH Global
In January of 2009, the first mapping/needs assessment team travelled to Rwanda as World Water Corps volunteers. The assessment was one of the first stages in the strategic planning process for Water for People’s Rwanda program. This presentation will provide an overview of the work carried out in Rwanda as well as the World Water Corps volunteer experience in general.

SESSION 10
WATER REUSE PLANNING & IMPLEMENTATION THROUGHOUT NEW ENGLAND

In Quest for Regional Solutions: Upper Taunton River Regional Wastewater Evaluation Project”
John Gall, Jack Hamm, Pamela Truesdale, Pat Ciaramella, Francis Yanuskiewicz
Speaker: John Gall, CDM
The Upper Taunton River Watershed area has experienced significant growth over the past decade. Appropriate wastewater treatment and disposal practices are critical to supporting the communities' economic development plans. However, communities in this region are finding it increasingly difficult to dispose of wastewater in an environmentally acceptable manner. Since community-centered wastewater management alternatives are limited for several Upper Taunton River communities the concept of regional solutions for mutual benefits was revived for this planning study.

“Denitrification: Simple Tests to Optimize Performance and Reduce Costs”
Heather Phillips, James Barnard
Speaker: Heather Phillips, Black & Veatch
This presentation will discuss parameters which affect denitrification, from the obvious (mixed liquor recycle rate, dissolved oxygen set-points) to the not so obvious (solids retention time, alternative carbon sources, sidestream management). Simple denitrification tests can be conducted in less than an hour, for less than $100 to optimize performance and support model calibration efforts. In the case studies presented, plant operators use design models to bridge the gap between design efforts and real-world utility management.

“Nitrogen Removal: Lessons Learned”
Grant Weaver, The Water Planet Company
For more than a decade, the author has overseen the day-to-day operation of more than 20 nitrogen removing wastewater treatment plants of various designs. Operational experiences will be shared as a series of “lessons learned.” Among the lessons: conventional wastewater treatment “rules” no longer apply. Counter-intuitive practices can improve treatment. Examples: reducing aeration, overloading primary clarification, accepting additional septage, and recycling anaerobically “fermented” waste sludge.

SESSION 18
GROUNDWATER: CAN THIS RESOURCE BE PROTECTED?

“Groundwater Withdrawal Management: Limiting Impacts to Wetlands and Sensitive Ecological Receptors”
Kris Masterson, Robert Schreiber, Andrew Miller
Speaker: Kris Masterson, CDM
Sustainable water resource planning requires integrated study of the potential ecological impacts associated with groundwater withdrawals. For a well field permitting study, CDM developed an innovative approach for managing increased pumping at an existing well field, which is located on a land parcel with extensive wetlands that include protected wetland species and fish habitat. This presentation will provide an overview of the approach developed for monitoring and managing groundwater withdrawals to limit wetland impacts.

“Simulation of Pilot Scale In-Situ Fixation of a Hexavalent Chromium Plume at the Puchack Well Field Superfund Site”
Matthew Gamache, Robert Schreiber, Frank Tsang
Speaker: Matthew Gamache, CDM
The Puchack Well Field Superfund Site, located in Pennsauken Township, Camden County, New Jersey, contains hexavalent chromium and trivalent chromium at concentra-
A key element in the successful implementation of an ultraviolet (UV) disinfection system is the proper control and operation of the UV lamps. Accurate and repeatable flow measurement is critical to maximize the efficiency of the UV system. This paper will address the unique characteristics of the multiple chordal-path transit-time flow measurement technology and how these characteristics enable a UV system to achieve the goal of assured continuous disinfection while maximizing the system’s efficiency.

NEIWPC was retained by the Connecticut DEP to provide assistance to WPCFs to improve nitrogen removal. The program involved an assessment of plant performance, focused on-site training and a series of four workshops focused on process control planning to optimize nitrogen removal under normal, wet and cold weather conditions. The presentation will focus on the technical aspects of the assessments and on-site training, the factors that impacted nitrogen removal and measures recommended to improve performance.

This case study will compare and evaluate the performance of an addition of a supplemental carbon source to enhance nitrogen removal at the West Haven, Connecticut POTW over a three month operating period. The case study will specifically examine overall total nitrogen removal efficiency for 24 hour operating conditions by utilizing online continuous nitrate monitoring data coupled with the addition of supplemental carbon.

The University of Connecticut at Storrs is progressively seeking to implement wastewater reuse as an alternative to reducing demand on its water supply system. This presentation will outline the University’s water supply status and list the incentives for developing a beneficial reuse project. Treatment technologies considered for the reclaimed water facility will be discussed, as well as the proposed process for developing a reuse program for the State.

This study reviews available TOC removal technologies and their capital, operational and maintenance cost. The reliabilities of each treatment processes were also evaluated based on the performance of existing units. The goal is to find a cost-effective and reliable treatment process for TOC removal.

In response to the many challenges being faced in the water sector, utility leaders have worked together to help improve water-sector management. Their product, Effective Utility Management: A Primer for Water and Wastewater Utilities, paints a picture of what an effectively-managed utility might look like and gives five simple steps for assessing management practices at your own utility. This presentation will walk through those details and discuss how asset management can improve overall utility performance.
“Asset Management for Small Communities”
  Timothy Taber, Stuart Baird
  Speaker: Timothy Taber, GHD
Lake Placid, NY implemented an Asset Management program for their small wastewater treatment plant (2.1 mgd annual average flow) utilizing free tools and resources provided by USEPA. This presentation provides a detailed review of the steps taken in the execution of the Asset Management Plan, a review of the results, and a discussion on the current use of the results and the upkeep of the data.

“Highly Effective Teams Require Training”
  Christopher Hall, Cincinnati Metropolitan Sewer District
MSD Cincinnati created a highly effective team to introduce asset management to the utility. MSD now seeks to implement asset management using a task team approach to create new capability to execute asset management but highly effective teams need tools and training. This paper describes the tool and training development process at MSD that includes these steps: team selection, forming, performing, pilot testing, new process documentation, process owner training, and quality management.

“Planning for the Future - A Biosolids Facility Condition Assessment”
  Jeffrey Hillman, Carl Pawlowski, Daniel O’Brien
  Speakers: Jeffrey Hillman, AECOM
  Carl Pawlowski, MWRA
The MWRA owns a Biosolids Processing Facility in Quincy MA. The operation and maintenance of this facility is contracted out to a private concern, the New England Fertilizer Company (NEFCO). The contract is due to expire in 2015 and, in anticipation of that event, the Owner elected hire a consultant to assess the condition of the facility and to ascertain the anticipated remaining life span of the equipment and systems utilized to process the biosolids. This paper presents the results of that evaluation.

SESSION 12
PLANT OPERATIONS II - NITROGEN UPGRADE CASE STUDIES: IT WORKS!

“Nitrogen Removal at the Danbury, CT WPCP Using a Post Anoxic Zone With Supplemental Carbon Addition”
  William Brink, Marc Drainville
  Speaker: William Brink, Stearns & Wheler GHD
The Danbury, CT WPCP was upgraded to achieve nitrogen removal by modifying the existing aeration (nitrification) tanks with post anoxic and re-aeration zones, with supplemental carbon addition to the post anoxic zone. The Post Anoxic modification will achieve

“Albany Pool Communities’ Bacteria Impacts on the Hudson River from Combined Sewer Overflows”
  Giana Park, Gary Mercer
  Speaker: Giana Park, CDM
This study assesses effects of CSO discharges from the Albany Pool communities - Albany, Cohoes, Rensselaer, Troy, Watervliet, and Green Island - on the Hudson River. It prioritizes areas of major concern regarding water quality impacts and identifies abatement alternatives most applicable and beneficial for meeting water quality standards and use objectives. A five-year computer model simulation will evaluate CSO control and wastewater treatment facilities improvement alternatives and the impact of non-point sources.

SESSION 16
INSTRUMENTATION, MODELING AND COMPUTER APPLICATIONS

“Using Ambient Information Systems to Change Water Use Behavior”
  Marcus Quigley, Jeffrey Edstrom, Rebecca Place Miller
  Speaker: Marcus Quigley, Geosyntec Consultants, Inc.
A growing number of utilities are switching to automated fixed systems to collect water use data in their communities. However, this near real-time information is not being distributed immediately to consumers. Ambient information systems that convey real-time water use data and resource impact information via in-home, wirelessly-connected display devices provide an engaging and approachable means to directly connect consumers to their water environment and motivate them to change their behavior in socially beneficial ways.

“Agent-based Modeling of Phosphorus Removal in Wastewater”
  Vanni Bucci, Nehreen Majed, April Gu, Ferdi Hellweger
  Speaker: Vanni Bucci, Northeastern University
In this study, the microbial population of a biological wastewater treatment process was modeled using agent-based methods. The model predicts the heterogeneity in nutrient content within the population. The model results are compared to observations.

“SCADA 101: How Wastewater Utilities Control their Operations”
  Leroy Kendricks, Woodard & Curran
Supervisory Control and Data Acquisition (SCADA) is a critical component of a water or wastewater system. Using this modern control and information technology can lead to success stories of a facility’s ability to save money, cut operating costs, reduce energy consumption, optimize process control and overcome staffing shortages. Attendees will learn about the multi-faceted components of SCADA and its benefits.
SESSION 15
CSO/WET WEATHER ISSUES II - WATER QUALITY IMPACTS

“Narragansett Bay Commission CSO Tunnel – Evaluation of First Year of Operation and Water Quality Benefits”
Philip Albert, Thomas Uva

Speaker: Philip Albert, Narragansett Bay Commission

Startup of the Narragansett Bay Commission’s 3 mile long CSO tunnel commenced in November 2008. Testing of tunnel systems and operational strategies had been completed. In addition, an extensive receiving water quality monitoring program was undertaken to document the impacts on the Narragansett Bay Ecosystem and new monitoring protocols were implemented to reduce shellfishing closure periods following rain events. Performance data from the first year of operation and receiving water monitoring data will be presented.

James Fitzpatrick, Matt Bond, Larry Jaworski

Speaker: James Fitzpatrick, Black & Veatch

Many communities across the United States are implementing CSO and SSO control programs despite concerns about the lack of a comprehensive and tenable national policy regarding wet weather treatment. Some POTWs have installed auxiliary treatment facilities using state-of-the-art technologies to provide high levels of treatment of wet-weather excess flows. Auxiliary treatment performance data will be presented along with examples of how this strategy appears to fit (or doesn’t) within the current Clean Water Act regulations.

“One Step at a Time: A Phased Approach to Implementing a CSO Control Plan”
James Drake, Michael Stuer, Mark Young

Speakers: James Drake, CDM and Michael Stuer, Lowell Regional Wastewater Utility

Since 2003, LRWWU has been implementing its Phase I LTCP and has achieved considerable, documented success and has expended more than $65 million. Based on continued assessment of the existing collection and treatment facilities, LRWWU has made improvements above and beyond the negotiated Phase I Plan. The results of the Phase I program in reducing CSOs from the Lowell CSS will be presented along with the proposed phased program of CSO control implementation for the future.

greater nitrogen removal (to 4.0 mg/l) than attainable by the more commonly used MLE configuration (pre anoxic zone with nitrate recycle). Supplemental carbon is added based on real time measurement of plant flow, nitrate and DO.

“The Story of the First Municipal MBR in CT: Two Years of Performance and Operations”
Susan Guswa, Peter Valinski, Roger Gervais

Speaker: Susan Guswa, Tighe & Bond

Membrane bioreactors replaced existing sequencing batch reactors at the municipal Redding, CT WPCF, more than tripling capacity to 0.245 MGD while minimizing the footprint of the expansion and enabling the WPCF to meet stringent nutrient limits. Since start-up in late 2007, the MBR has consistently produced excellent effluent quality. This presentation will focus on the operation and performance of the MBR.

“All Hands on Deck: Strategies for a Successful Conversion to BNR”
Maureen Neville, Karla Sangrey, Georgine Grissop

Speaker: Maureen Neville, CDM

The challenges of starting up a new biological nutrient removal process at the Upper Blackstone Water Pollution Abatement District (District) Wastewater Treatment Facility were managed with collaboration between the owner and engineer through all phases of the project. Thorough planning and an extensive training regimen were the cornerstones for the successful start-up. The new design provides the flexibility to operate in three different process modes resulting in a more sustainable treatment system.

SESSION 13
SMALL COMMUNITY WASTEWATER SOLUTIONS: NOT SMALL ON IDEAS

“Regional Solutions to Wastewater Management Problems through Groundwater Modeling of Water Reuse”
Frances Bui, Buvana Ramaswamy, Robert Schreiber, David Young

Speaker: Frances Bui, CDM

As part of a regional alternative for Mansfield, Foxborough, and Norton (MFN), the Town of Mansfield, Massachusetts is in the process of evaluating alternatives and identifying potentially feasible sites for treated effluent recharge as part of the Comprehensive Wastewater Management Plan (CWMP) process. Intensive field data collection, historical information review, and interaction with regulatory agency personnel provided the bases for the development of a 3-dimensional groundwater model to predict the potential impacts of effluent recharge.
“Crotched Mountain Rehabilitation Center (CMRC) Wastewater Treatment Improvements”
Thomas Page, Raymond Sebold, Henry Albro

Speaker: Thomas Page, Underwood Engineers, Inc.

This paper discusses the process of design, construction and start up performance of an on-site wastewater treatment plant, including a submerged attached growth bioreactor (SAGB) and on-site trench and drip tube effluent disposal, to meet stringent effluent requirements at the Crotched Mountain Rehabilitation Center in Greenfield, NH. Creative solutions for treatment and disposal were used to accommodate rigorous site conditions and minimize impact to the existing forested slopes.

“Tools for Ensuring that Your Wastewater Project is ‘Growth-Neutral’”
Michael Giggey, Patty Daley

Speaker: Michael Giggey, Wright-Pierce

Recent changes in the state revolving loan program in Massachusetts provide for zero-interest loans for qualifying nutrient-control projects. To qualify for those favorable loans, an applicant must demonstrate that the project is "flow neutral", that is, it will generate no more wastewater flow than would have occurred under current zoning and on-site disposal rules. This presentation summarizes the options available to meet that flow neutrality requirement.

“Permit Problems Portend Need for Pretreatment Programs at Puny Plants”
Nick Tooker, Todd Brown

Speaker: Nick Tooker, Tighe & Bond

Wastewater from a tool manufacturing facility’s industrial process is believed to have caused a string of permit violations at the Shelburne Falls WWTF during 2007 and 2008. Data from before and after startup of the industrial process, as well as following process modifications, will be presented. The focus of the talk will be on the need for small facilities to have sufficient ability to regulate and control industrial wastewaters that are discharged to their system.

SESSION 14
ENERGY I – DEMAND SIDE/ENERGY EFFICIENCY

“Save Money by Understanding NFPA 820 and How it Affects Energy Usage at your Wastewater Plant”
Mary Ellen Parkman, Wilbur Horton

Speaker: Mary Ellen Parkman, Stantec

This presentation will review NFPA 820, discuss ventilation requirements, and present ways to lessen its impact at your facility.

“An Efficiency Comparison of New Turbo Aeration Technology with Respect to Positive Displacement and Centrifugal Technology”
George Lawrence, James Jutras, Tim Grover, Jake Yanulavich

Speaker: George Lawrence, Efficiency Vermont – VEIC

Turbo blower technology has the potential to save significant energy at wastewater treatment plants by requiring less energy and power than other technologies to produce low pressure air for the aeration of wastewater lagoons. This paper quantifies the savings for blowers in the 50 to 100 horsepower range in two cases. In one case, a turbo blower was compared against a positive displacement blower over each blower’s range of operation. The second case compares a turbo blower against a centrifugal blower.

“Thorough Mixing vs. Energy Consumption”
Srinivas Gidugu, Bruce Pierstorff, Matthew Osit, Salil Kharkar

Speaker: Srinivas Gidugu, Hazen and Sawyer

This paper will present the evaluation of Invent mixers in two US applications. These include: thorough mixing testing results of the hyperboloid and conventional vertical shaft mixers at a 370 mgd plant in the District of Columbia, and a three year pilot test of two hyperboloid mixers followed by installation of 90 units at a 150 mgd plant in New York. Findings will include: flow mixing patterns and test results, and capital and operating costs.

“Improving Aeration Efficiency and Saving Energy at a New England Cheese Manufacturing Wastewater Treatment Facility”
Gary Johnson, Mathew Cinadr

Speaker: Gary Johnson, Environmental Operating Solutions, Inc.

The Via Cheese Water Pollution Control Facility (WPCF) services cheese processing wastes and was upgraded to a six cell aerated lagoon system in 1993. In 2007 Via Cheese spent $107,280 for electricity for the WPCF uses. Of the $107,200, approximately 90% of the entire electrical use was for aeration at the WPCF. This case study will evaluate potential electrical cost savings measures and process control improvements that can be implemented to reduce electrical use at the facility. The case study will show a potential estimated electrical savings of up to 572,000 kwh or approximately 50% of the entire energy use at the WPCF.