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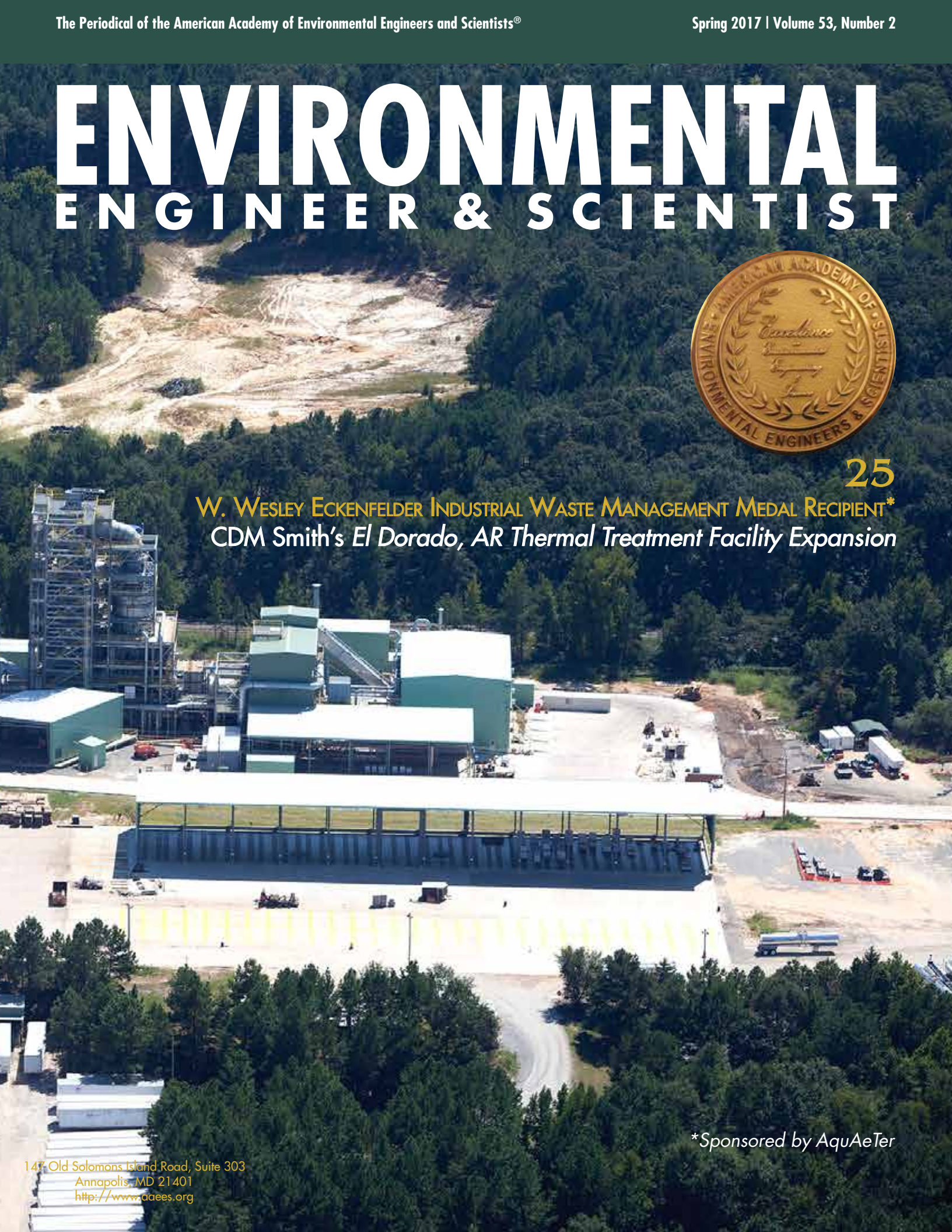

25

W. Wesley Eckenfelder Industrial Waste Management Medal Recipient*

CDM Smith's *El Dorado, AR Thermal Treatment Facility Expansion*

*Sponsored by AquAeTer

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PRESIDENT'S PAGE

Robert C. Williams, P.E., BCEE

Time to Celebrate!

Each year at this time, it is the privilege of the Academy to hold the Annual Excellence in Environmental Engineering and Science (E3S) Awards Luncheon and Conference at the prestigious National Press Club in Washington, D.C. Organizations throughout the environmental engineering and science community submit impressive project entries that are carefully evaluated by our excellent team of voluntary judges to determine the winners of the Superior Achievement Award, Grand Prizes, and Honor Awards. This year was no exception; those of you attending the event in April will agree that the projects on display demonstrate the amazing skills and expertise of environmental professionals across an array of topics. In addition, this annual recognition also provides a forum where the Academy can recognize the contributions of our members in the fields of environmental engineering and science. I personally find listening to the various speakers and awardees uplifting, knowing that our profession has much to offer through extraordinary accomplishments and exceptional practices. It makes me even more proud to be an environmental engineer. Thanks to all who participated in making the 28th E3S a successful tribute and a hearty congratulations to all the award recipients!

Organizations today are finding it more difficult to provide employees with external professional growth and support opportunities. Companies and individuals alike say that belonging to several professional groups and obtaining numerous licenses and certifications while maintaining a competitive edge is more difficult now. So, when determining which group to belong to or which certification to obtain, an emphasis is placed on the value proposition of these various professional opportunities.

The AAEES Board of Trustees has examined the idea of the value proposition as applied to the Academy and developed the list found in the accompanying text box. The list is certainly not exhaustive, but it is revealing. Beyond the mark of distinction that Board Certification brings, and the coveted Academy E3S Awards, there are other important reasons shown for why individuals are drawn to the Academy. Such reasons resonate with our members and are fully embraced by the Academy's Patrons.

Value Proposition List for AAEES Membership

Value to Members

- Highest level of environmental engineering and science credentials in specialty certifications
- Pride in Accomplishment
- Career advancement/marketability
- Enhanced technical respect and expert witness credentials
- Networking opportunity with most advanced technical leaders
- Access to leading-edge publications and workshops
- Annual awards program provides top tier peer recognition
- Opportunity to provide service to the profession

Value to CEOs, Agency and Academic Leaders with respect to their Organizations

- Demonstrates commitment to excellence
- Achieves recognition by clients, regulators, public
- Provides access to leading edge technical knowledge
- Enhances project reliability, cost efficiency, profitability
- Improves environmental innovation and impacts
- Enhances sustainability and organization's brand
- Supports "employer of choice" status

You may not be aware that every Spring the Academy has a promotion to recruit new members. The deadline for submittal of applications is the end of March, but in reality, we look to encourage members to join and/or to seek Board Certification throughout the year. Since most individuals learn about the Academy from those who are already members, it's imperative that each of us reach out to those we know who possess the desired prerequisites. As you approach your colleagues about becoming Board Certified, explaining to them why you are Board Certified, you can use the values proposition list as some of the many reasons why they should follow your lead.

These values of membership can be applied to all levels of the profession and to various levels of experience. Even young professionals will find them attractive. Young people of today are drawn to environmental engineering and science for much different reasons than I was. For us to communicate with them, we need to understand these reasons and continue to adapt our message. Values and maxims may be old school, but they still make a difference to employers and clients today, and young professionals realize that as well. Recently, listening in on podcasts that involve students and young professionals, I find that they are still interested in what makes a fulfilling profession, what makes a good professional, and how they can achieve excellence. Sounds a lot like the questions I was asking almost a half century ago. Perhaps we are not all that different from the upcoming generations of engineers and scientists.

> "As you approach your colleagues about becoming Board Certified, explaining to them why you are Board Certified, you can use the values proposition list as some of the many reasons why they should follow your lead.

Last Spring, Past President Howard LaFever challenged us all to "just do it." He wanted us, as members of the Academy, to share our knowledge, expertise, professionalism, and enthusiasm with the next generation. That message is just as appropriate this Spring. We should continue to mentor, encourage, and teach others about this really great profession to which we belong. And at the same time, remind students, young professionals, and those we work with that the dividends of being Board Certified are valuable and the value proposition of belonging to AAEES is strong. It is our responsibility as professionals to "just do it."

Again, congratulations to all those recognized at our Annual E3S celebration and thanks to all our members for your excellence in environmental engineering and science!

EXECUTIVE DIRECTOR'S PAGE

Burk Kalweit

Environmental Engineering Science

One of the more interesting things we're working on at the Academy is the effort to assist ABET in developing an accreditation for environmental science programs. Working as the lead society in this effort means that the Academy will be at the forefront in defining the academic curricula and activities that will be required of educational institutions who seek to have an ABET-accredited environmental science program. A lot of work has been done to date, but there is a lot more still to be done before we begin the process of defining the basic building blocks and all the subcomponents that must be assembled to build that core of activities that will result in the new accreditation.

One of the things that we found particularly intriguing is the question of where does environmental science fit into the overall landscape that the Academy ordinarily covers. While we have a reasonably good understanding of the role that the environmental engineering accreditation plays, and we know which schools are active within the confines of the ABET program, we actually know relatively little about the corresponding activities among those schools that offer environmental science programs. Simple questions, such as how many schools offer environmental science programs or what are the constituent components of the environmental science programs currently being offered, were not in our data banks when we first started working with ABET in the environmental science area.

Where there is an information vacuum, we are obliged to do the best we can to fill it. So we started scratching around a bit to help us define the entire environmental science area qualitatively, and to the degree that we could, quantitatively. The first place we looked was the existing structure of environmental engineering programs that are ABET accredited. The theory was that there are a number of schools that are actively offering environmental science programs and these programs are, at least to some degree, offshoots of environmental engineering programs that were already in place. Given the knowledge convergence of engineering and science in the environmental area, it seems only logical that a connection such as this exists.

Diving into our files, we found that in 2016 there were 70 ABET-accredited environmental engineering programs in the United States. This is up a few from the 66 programs that were active in 2014. The list of accredited schools can be found on the ABET website (http://www.abet.org) and contains everything from very large programs such as the University of Florida, which graduates roughly 100 environmental engineers every year, to Stevens Institute, which runs a small program that typically has a combined total of fewer than twenty students enrolled in its graduate and undergraduate environmental engineering program.

> "But the proposition we want to test is to see how many schools with engineering programs also have environmental science to offer to their students.

But the proposition we want to test is to see how many schools with engineering programs also have environmental science to offer to their students. And here, we need to apologize for being relatively non-rigorous because our examination is a cursory one at this point. We went to each of the ABET schools' websites to see if there was mention of environmental science as a program or as a course offering. This is a pretty simple binary check. Environmental science either appeared or it did not. I'm not sure if it's surprising, but the preponderance of the schools that offered an environmental engineering program also offered one in environmental science. By our admittedly unscientific and non-rigorous analytical approach, we found that only 19 of the schools that have ABET-accredited environmental engineering programs did not also offer an environmental science program of some kind.

I add that last qualifier -- of some kind -- because when you start looking closely at the environmental science program offerings of the various schools, there are some interesting items to be aware of. The first of these is that the environmental science programs also typically include 'social science' offerings. This is an interesting development in the context of environmental topics because what one sees quite frequently is that, in addition to hard science program offerings, there are also courses and majors offered in things like environmental studies, earth systems science, environmental science and sustainability, environmental planning and management, environmental design, and environmental policy and resource economics.

This presents an interesting challenge from the perspective of environmental scientists and engineers working together across a multiplicity of topics and interests. One very popular option that we saw was a course offering simply identified as environmental studies. What does that mean? Well, we found a range of topics and related interest, activities that fell into the bucket. So to make it easy for ourselves, we went to Wikipedia and found the following definitions for environmental science and environmental studies:

- **Environmental science** is an interdisciplinary academic field that integrates physical, biological and information sciences (including ecology, biology, physics, chemistry, zoology, min-

eralogy, oceanology, limnology, soil science, geology, atmospheric science, and geodesy) to the study of the environment, and the solution of environmental problems.

- **Environmental studies** is a multidisciplinary academic field which systematically studies human interaction with the environment in the interests of solving complex problems. Environmental studies brings together the principles of sciences, commerce/economics and social sciences so as to solve contemporary environmental problems. It is a broad field of study that includes the natural environment, built environment, and the sets of relationships between them. The field encompasses study in basic principles of ecology and environmental science, as well as associated subjects such as ethics, geography, policy, politics, law, economics, philosophy, environmental sociology and environmental justice, planning, pollution control and natural resource management.

There clearly is a difference, but turning that definitional difference into real world actions and activities should prove interesting. The primary difference seems to be that the environmental studies area encompasses the interactions between people, the environment, and all the systems that have been created to promote the interaction between the two. Science, on the other hand, as defined above, appears to be much simpler. It seems to be quite happy being a technical discipline which will be employed to use the tools of science to create solutions to environmental issues and opportunities.

So the situation became just a little less clear when we tried to determine what fits where and how the interactions between the various subsets can be mapped. Then there is something else we need to also take into account. The cursory analysis above only deals with the world as it is currently impacted by ABET accredited schools on the engineering side. We can recognize that there will be an interplay with environmental engineering and environmental science once the ABET accreditation for environmental science is established, but for now, we are only dealing with the pieces that we recognize and understand. What we are missing is an accounting of the world that extends beyond the boundaries that the ABET accreditation covers. In other words, are there programs out there that ABET does not work with that are, nonetheless, potentially important components of our view of environmental science? Sounds like a lead-in for more research, doesn't it?

“So the situation became just a little less clear when we tried to determine what fits where and how the interactions between the various subsets can be mapped.

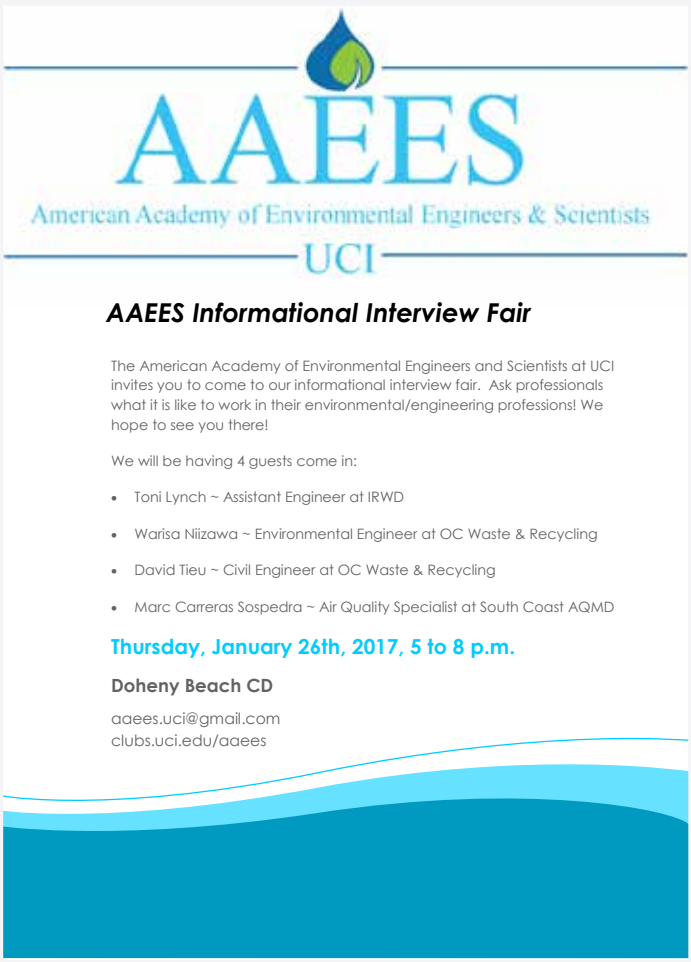
So we did little more unscientific digging to see what we can find out about the world beyond ABET. Taking the simplest possible approach, we did a search for colleges and universities that have an environmental science program. What we found was very interesting and, to a degree, troubling. It turns out there are roughly 140 colleges and universities -- other than the ABET-accredited environmental engineering schools -- who are offering a program, or at least courses for a minor, in environmental science. Who knew?

Where does that leave us? Does confused seem like the appropriate descriptor? If not confused, then at least somewhat taken aback by the sheer volume of what is out there. It appears that there is an entire world out there that needs to be investigated and considered in our efforts to set the standards for the accreditation of environmental science programs. For what it's worth, the world appears to need some congealing around the points of commonality that exist so that we end up with a view of environmental science that is much more focused and much easier to integrate into the activities of others. Which is the ultimate point of this entire endeavor; we need to build the structures and establish the mechanisms that will enable environmental scientists to work with environmental engineers while also finding a role for the environmental studies people to assist in building the communication bridges between the technical perspectives and the societal perspectives. Nobody said it was going to be easy, but if we do this right, we will be making major enhancements to fulfilling our mission of protecting public health and protecting the long-term vitality and sustainability of our built and natural environment.

STUDENT CHAPTER NEWS

STUDENT CHAPTER AT UCI HOLDS INFORMATIONAL INTERVIEW FAIR

The AAEES Student Chapter at University of California-Irvine (UCI) held an Informational Interview Fair on January 26, 2017. UCI Student Chapter at AAEES *aims to provide opportunities for environmental engineers and scientists to better themselves academically, professionally, and socially*. UCI had four professionals participate in informational interviews with students to share details about their jobs and career advice. ***AAEES thanks AAEES-UCI Student Chapter President, Connie Loo, for organizing the event and providing photos for this feature.***



Following is a list of active AAEES Student Chapters. If you would like to start one at your school, go to http://www.aaees.org and click "How to Start a Student Chapter."

California Polytechnic State University
California State University at Fullerton
Columbia University
Cornell University
Florida International University
Georgia Institute of Technology
Johns Hopkins University
King Abdullah University of Science and Technology
Lehigh University
Northwestern University
The Ohio State University
Stevens Institute of Technology
Suffolk University
Texas A&M University
University of California – Irvine
University of Colorado, Boulder
University of Georgia
Miami University
University of Wisconsin
Vanderbilt University
Worcester Polytechnic Institute

Officer Nominees for 2018

The Academy's Nominating Committee is chaired by Past President James Stahl. Its members include Lilia A. Abron, Pasquale S. Canzano, Christian Davies-Venn, Jeffrey H. Greenfield, Merlyn L. Hough. The following candidates have been recommended for 2018.

PRESIDENT-ELECT

Kristin Morico, P.E., BCEE, CSP, F.ASCE

VICE PRESIDENT CANDIDATES

Lilia Abron, Ph.D., P.E., BCEE
James W. Patterson, Ph.D., BCEEM

TRUSTEE-AT-LARGE CANDIDATES

James Clarke, Ph.D., BCES
James D. Fitzgerald, P.E., BCEE, C.E.M.
David A. Vaccari, Ph.D., P.E., BCEE
Richard P. Watson, P.E., BCEE

PRESIDENT-ELECT

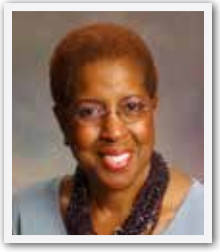
Kristin (Kris) Morico, P.E., BCEE, CSP, D.WRE, ENV SP, F.ASCE, is currently the leader of environmental programs for GE's Global Operations EHS Group. Previously, she was the Global Leader of GE Water Programs and other adjacent activities. In this new role, Kris is responsible for the development and implementation of associated environmental programs globally working closely with GE's regions and business segments. She has been with GE for 8 years.

Kris began her career working in the municipal water sector as a process engineer for the Regional Water Authority in New Haven, CT, and over the past 30 years (the past 11 of which have been in an executive capacity), she has assumed leadership positions of increasing responsibility. Kris has assumed a variety of positions across several Fortune 500 companies including Clairol, Inc., Malcolm Pirnie, Inc., environmental consultants, Environmental Compliance Officer for ABB/Combustion Engineering, Director of Global Environmental Programs and EHS Governance at Pratt and Whitney (Division of UTC), and most recently (prior to her present role with GE), she was the Director of Environmental Programs at Tyco International located in Princeton, NJ.

Kris possesses a BS in Biology from Fairfield University, MS Civil Engineering from the University of Connecticut, MEM Environmental Management from Yale University, and an EMBA from the University of Connecticut. She is a licensed Professional Engineer in 8 states, Board Certified Environmental Engineer in the American Academy of Environmental Engineers, Certified Safety Professional, and a Certified Sustainability Professional. She also possesses a Class IV Water Treatment Plant Operators License issued by the State of Connecticut Department of Public Health and is an Environmental Laboratory Director through the same agency.

Kris is an active member in several professional EHS organizations and was elected to the status of Fellow in the American Society of Civil Engineers and Vice President Elect for the National Association of Environmental Managers (NAEM) and serves on the advisory board for the University of Connecticut School of Civil and Environmental Engineering as well as a Board of Trustee of the American Academy of Environmental Engineers. Kris is a visiting lecturer at Yale School of Forestry and Environmental Studies and was inducted into the Academy of Distinguished Engineers at the University of Connecticut School of Engineering in 2011.

VICE PRESIDENT



Dr. Lilia Abron, P.E., BCEE, is the Founder, President and Chief Executive Officer of PEER Consultants, P.C. (PEER), a full-service environmental engineering consulting firm founded in 1978. The award-winning firm has a full-time staff of more than 100 engineers, scientists, technicians, and administrative professionals with headquarters in the District of Columbia. PEER has five office locations in the United States and has international offices in Johannesburg and Cape Town, South Africa.

PEER Africa Western Cape, CC was founded in 1995 by Dr. Lilia Abron, Douglas "Mothusi" Guy, MBA, and Thami Eiland, our South African community partner. PEER Africa is a design-build firm specializing in upgrading and transforming informal communities to resilient, sustainable formal communities.

Dr. Abron has over 40 years of experience in planning, managing and directing environmental engineering programs for the improvement, maintenance and enhancement of the physical and human environments. In 1978, PEER was established and built under Dr. Abron's belief that humans and the physical environment are fully compatible and co-exist to mutually benefit one another.

In November 2016, Dr. Lilia Abron was inducted into the prestigious Tau Beta Pi organization, DC Alpha Chapter - a national engineering honor society - as an Eminent Engineer. Dr. Abron is among only a select number of candidates to receive this highest honor.

Under Dr. Abron's leadership, the firm has been awarded the following accolades over recent years: *ENR/Engineering News-Record* '2015 Top Design Firm' in the Mid-Atlantic; 'Top Ranked Environmental Consultant' - 2013 and 2014 - *Washington Business Journal*; "2012 Superior Achievement Award" in the Environmental Sustainability category for the *Witsand iEEECO™ Sustainable Human Settlement Project in South Africa*; American Council of Engineering Companies of Massachusetts (ACEC/MA) Engineering Excellence Award (EEA) for the *Nashville Long Term Recovery Plan in Tennessee.*

James W. Patterson, Ph.D., BCEEM, is an internationally-recognized expert on industrial pollution control. Dr. Patterson is a member of the AAEES Executive Committee and is currently serving his second 3-year term on the Board of Trustees. He was the 2011 AAEES Kappe Lecturer, has served on the AAEES Membership Committee, and since 2010, as Vice-Chair of the AAEES Certification by Eminence Committee. He also serves as Vice-Chair of the AAEES Environmental Scientist Certification Board.

He is Principal of Patterson Environmental Consultants, Inc., which specializes in industrial waste management. Dr. Patterson previously served as Professor and Chairman of the Pritzker Department of Environmental Engineering at the Illinois Institute of Technology (IIT) in Chicago for 20 years, and as Director of the EPA-sponsored Industrial Waste Elimination Research Center of Excellence at IIT for 8 years. He received his Ph.D. in Environmental Engineering in 1970 from the University of Florida, and his B.S. and M.S. degrees in 1964 and 1967 respectively, from Auburn University.

Dr. Patterson is the author of two books on industrial wastewater treatment, editor of a three-volume series on industrial pollution prevention, co-editor of a nine-volume series on water quality management, and has authored more than 100 other book chapters and technical papers. He was Chair of the WEF Journal *Water Environment Research* Board of Editors. He has served as an international consultant and advisor to numerous industries and government agencies, including the U. S. Congressional Office of Technology Assessment, the US EPA, Department of Defense, and Department of Justice, the Illinois Pollution Control Board and Illinois EPA, the Kentucky Department of Natural Resources, the New York State Hazardous Waste Center, and the Ohio EPA.

During 1983-84, Dr. Patterson served as Executive Director of the State of Illinois Hazardous Wastes Task Force. He has served as Chair of the International Joint Commission Expert Committee on Engineering and Technological Aspects of Great Lakes Water Quality, and as Chair of the State of Illinois Effluent Standards Advisory Panel. Dr. Patterson was appointed a Charter Member of the US EPA National Advisory Council for Environmental Technology and Policy.

TRUSTEE-AT-LARGE

James H. Clarke, Ph.D., BCES, F.AAFS, is Professor of the Practice of Civil and Environmental Engineering and Professor of Earth and Environmental Sciences at Vanderbilt University. He also serves as Director of Graduate Studies for the graduate program in Environmental Engineering. Jim's research interests are in the areas of sustainable environmental protection, nuclear environmental engineering, environmental risk analysis and performance assessment, the investigation, remediation and long-term management of contaminated sites, and the environmental consequences of energy choices.

Jim was a member of the Nuclear Regulatory Commission (NRC) former Advisory Committee on Nuclear Waste and Materials and was its lead member for decommissioning and risk-informed regulation. He currently serves as a consultant to the NRC Advisory Committee on Reactor Safeguards and its subcommittee on Radiation Protection and Nuclear Materials. Jim also served on the National Academy of Science Committees on Remediation of Buried and Tank Waste and Tritium Releases from Nuclear Power Plants. He is a peer reviewer for the Department of Energy, the Nuclear Regulatory Commission, the National Academies, the U.S. Environmental Protection Agency and several journals and book publishers. Professor Clarke has over 35 years of professional experience with approximately 200 publications and presentations. He received a Ph.D. in theoretical chemical physics from The Johns Hopkins University and a B.A. in chemistry with honors from Rockford College (now Rockford University).

James D. Fitzgerald, P.E., LSP, BCEE, is a member of the Academy's Hazardous Waste Management and Site Remediation (HWMSR) Committee (over ten years) and currently the Committee's Chair (over seven years). He has been a consultant his entire professional career, initially assisting municipalities with various water and wastewater treatment assignments (with Hazen & Sawyer) and then transitioning to assisting industrial clients (with ERM, Environ and Antea Group) addressing air, wastewater, hazardous waste management, and legacy site investigation and remediation needs.

If elected Trustee, he would focus on enhancing the community's (educators, practitioners, consulting firms, and clients) awareness of the Academy certification value proposition. Increasing Academy "brand" awareness will ensure practitioners seek Academy certification (to demonstrate their technical expertise) while also ensuring clients value working with certified practitioners (i.e., industry lead-

ers). The Academy's continued success (including financial stability) depends on the Academy being recognized as the environmental scientists and engineers "premiere" technical certification. Academy recruiting efforts will need to be customized to the unique "drivers" associated with the various community target subgroups.

Mr. Fitzgerald has a BE in Chemical Engineering and a ME in Environmental Engineering from Manhattan College. He is a licensed professional engineering in several states and a Licensed Site Professional (LSP) in Massachusetts. He was previously registered as an Association of Energy Engineers (AEE) Certified Energy Manager (CEM) as well as a Massachusetts Industrial Grade 4 wastewater treatment plant operator.

David A. Vaccari, Ph.D., P.E., BCEE, F.ASCE, is a professor of environmental engineering and Director of the Department of Civil, Environmental and Ocean Engineering at Stevens Institute of Technology in Hoboken, NJ. He holds bachelors, masters and Ph.D. degrees in environmental science, and a master's degree in chemical engineering, all from Rutgers University.

Dr. Vaccari specializes in the modeling and control of biological wastewater treatment and in modeling the aquatic fate and transport of pollution. This led him to develop new methods for nonlinear time series analysis in a wide range of applications. That and his involvement in long-term life support systems for NASA (recycling in space) led him to an interest in sustainability. There, he focuses on phosphorus resources, for which he is engaged in modeling material flow analyses and in forecasting of global resource supply and demand.

At Stevens, he is Director of the Department of Civil, Environmental and Ocean Engineering. He is coauthor of the textbook *Environmental Biology for Engineers and Scientists* (John Wiley). He served as a member of the Board of Directors of ABET Inc. as a program evaluator, and as a commissioner for the Engineering Technology Accreditation Commission. He is past chair of the AAEES Education Committee, and is a current member. He has won the Wiley/AEESP award for outstanding contribution to environmental engineering and science education, the American Council of Engineering Companies of New Jersey Educator-of-the-Year Award, and the Founders' Award for Outstanding Paper in *Water Research* from the USA National Committee for the International Water Association.

Richard P. Watson, P.E., BCEE, is the Chief Executive Officer of the Delaware Solid Waste Authority (DSWA). He leads the organization which is responsible for managing all municipal solid waste, recycling, household hazardous waste, electronic waste and other special waste programs for the entire State of Delaware. Mr. Watson joined DSWA in 1981 after working three years with Consolidated Rail Corporation as an environmental engineer designing fuel oil spill containment and treatment systems. He first served DSWA as a project engineer for Delaware's first double lined sanitary landfill. Through the next 35 years he has overseen design, construction, and operation of solid waste projects, including landfills, transfer stations, landfill gas control systems, and various recycling projects.

Richard has always volunteered to serve with various professional organizations. As an active member of the Solid Waste Association of North America since 1983, he served on the Board of the Mid-Atlantic Chapter including President. As a member of the International Solid Waste Association (ISWA), he became certified as an International Waste Manager which was the first from the United States. Mr. Watson has led instruction in landfill design and operation for ISWA in Russia and Asia and serves on their Landfill Committee. As a member of the Northeast Recycling Council he has served on their Board including President the last two years. In addition, Mr. Watson has served as an Environmental Engineering Program evaluator for the Accreditation Board for Engineering and Technology.

Mr. Watson has been a Professional Engineer in Delaware since 1983 and received his DEE certification in 1996. He has served as an AAEES Engineering Excellence Award judge, was on the Publication Committee, then on the Audit Committee for several years, including the last two years as Chair.

Ballots will be mailed in April.
To be valid, ballots must be received on or before June 15, 2017.

The AAEES *Honorees*

The AAEES Awards were established to honor and recognize distinguished environmental engineers, environmental scientists, educators, students, and professionals. Below is the criteria for each award. Profiles of this year's honorees are presented on the following pages.

Gordon Maskew Fair Award

The Gordon Maskew Fair Award honors one of the pioneers of environmental engineering. Dean Fair, in addition to his own exemplary career, spawned a living legacy during his lifetime -- those that he taught are now teaching us.

Through the Fair Award, the Academy seeks to identify Board Certified Environmental Engineers, Board Certified Environmental Engineering Members, and Board Certified Environmental Scientists who have contributed to the status of the environmental engineering or science professions by:

- Exemplary professional conduct
- Recognized achievements in the practice of environmental engineering and science
- Significant contributions to the control of the quality of the world's environment.

The Gordon Maskew Fair Award was established in 1971.

Edward J. Cleary Award

The Cleary Award is given to an individual who is an outstanding performer in the management of environmental protection enterprises conducted under either public of private auspices who have demonstrated exemplary professional conduct, personal leadership, originality in devising new environmental protection techniques and sensitivity and responsiveness to social, economic, and political factors in environmental protection.

The Edward J. Cleary Award was established in 1973.

Stanley E. Kappe Award

The Stanley E. Kappe Award honors the man whose dedicated leadership, strong devotion, and tireless efforts contributed so much to the growth and advancement of AAEES during the period he served as its Executive Director, 1971 to 1981.

This award is presented to the Board Certified Environmental Engineer or Board Certification Environmental Scientist who has performed extraordinary and outstanding service contributory to significant advancement of public awareness to the betterment of the total environment and other objectives to the Academy.

The Stanley E. Kappe Award was established in 1983.

Honorary Member

One or more Honorary Member may be selected each year by the Academy's Board of Trustees by affirmative vote of at least two-thirds of its members. The individual so honored possesses one or more of the following characteristics:

- has attained a position of eminence in the environmental engineering profession;
- has made a singular noteworthy contribution, or a sustained contribution, to the advancement of environmental engineering; and
- has performed outstanding service over a relatively long period of time in the advancement of the affairs of the Academy.

Honorary Members were established in 1982.

International Honorary Member

One International Honorary Member may be selected each year by the Academy's Board of Trustees by affirmative vote of at least two-thirds of its members. The individual so honored possesses one or more of the following characteristics:

- has attained a position of eminence in the field of environmental and/or human health protection internationally or in his or her country;
- has made a single noteworthy contribution or sustained contribution to the advancement of environmental and/or human health protection in a specific area internationally or in his or her country; or
- has rendered outstanding service over a long period of time resulting in the advancement of environmental and/or human health protection internationally or in his or her country.

International Honorary Members were established in 2014.

Excellence in Environmental Engineering Education Award

The E4 Award is granted to an educator who has made a significant contribution to the profession in the area of educating practitioners.

The Excellence in Environmental Engineering Education Award was established in 2012 and is jointly administered by AAEES and AEESP.

Innovyze Excellence in Computational Hydraulics/Hydrology Award

This award is given annually to recognize a student whose research contributes to the knowledge pool in the area of Computational Hydraulics & Hydrology. The award selection is based on original, innovative research of publishable quality. Both Master's and Ph.D. students are eligible.

The Innovyze Excellence in Computational Hydraulics/Hydrology Award was established in 2015 in association with the Association of Environmental Engineering and Science Professors and is sponsored by Innovyze.

Gordon Maskew Fair Award

Stephen J. Hickox, P.E., BCEE

Stephen J. Hickox, P.E., BCEE, Chairman and CEO of CDM Smith, has dedicated his entire 46-year career to helping clients solve the financial, legal, technical and regulatory components of their environmental and infrastructure challenges. Early in his career, as a project engineer/manager, he personally delivered on some of the most complex projects in CDM Smith's municipal portfolio. Later, known for his relentless focus on responsiveness and superior client service, he held a number of management positions with increasing geographic, financial, and sales responsibility. Most recently, before advancing to the executive leadership team, he was President of CDM Smith's largest unit where, in just three years, he grew sales by 60 percent and directed the firm's entry into the Latin American market. In his tenure as CEO, he has successfully led the development and implementation of an aggressive five-year strategic growth plan that has improved the firm's operational performance and increased sales while strengthening internal collaboration and teamwork.

With a particular passion and pride in the environmental engineering profession, Steve is highly respected as a mentor and trusted advisor and is a speaker at various industry conferences and events. As he travels throughout the world he meets and motivates CDM Smith's more than 5,000 employees by emphasizing how our profession improves the quality of life. It's a message that he strongly believes and one that all of us should be proud of.

Steve holds a BS in civil engineering from Merrimack College and an MS in civil engineering form Northeastern.

Edward J. Cleary Award

Sudhir Murthy, Ph.D., P.E., BCEE

Dr. Sudhir Murthy is Innovations Chief for DC Water and leads the development and implementation of the Authority's innovation strategy. Sudhir creates, defines and translates research and development into product, service or revenue concepts. Sudhir led the concept development for several programs at the Blue Plains facility that has led to nearly $1 billion in engineering/construction.

These innovative projects were developed though novel approaches of public-public partnership with other water utilities, and through collaboration with private enterprise and universities. More than 80 MS and PhD students from universities in North America, Europe, Australia and Africa, and their academic advisors have been contributing to the planning effort with most of these students 'insourced' to research at DC Water in a multifunctional and interdisciplinary setting. This approach is now viewed as a model for collaborative engagement by universities and utilities. Similarly, Sudhir is working with private enterprise in developing new approaches for 'co-innovation' between the water technology supply and demand sectors.

In the past five years, DC Water has won four of five Research Grand Prizes from the American Academy of Environmental Engineers and Scientists. Sudhir is a Professional Engineer and a Board Certified Environmental Engineer and has received several Water Environment Federation awards including the Ralph Fuhrman Medal for Academia-Practitioner Collaboration, the George Gascoigne Medal for Wastewater Treatment Operational Improvement and the Camp Applied Research Award.

Sudhir has championed the development of internal innovation programs as a means to developing sustainable and resilient water utilities, and is the founding chair of the joint utility program called LIFT – Leaders Innovation Forum for Technology with nearly 300 participating utilities. This program helps utilities with policies and approaches to drive innovation in the water sector.

Sudhir has a M.S. in Environmental Engineering and Ph.D. in Civil Engineering from Virginia Tech. He has over 90 peer review publications and over 250 publications or presentations. He was most recently selected to serve on the board of directors of the International Water Association. Sudhir is a third generation civil engineer born and raised in India. He is married to his civil engineer wife, Maureen and has two aspiring civil engineer children: Tara and Kieran.

Honorees

Stanley E. Kappe Award

Merlyn L. Hough, P.E., BCEE

Merlyn Hough is the Director of the Lane Regional Air Protection Agency (LRAPA) in Springfield-Eugene, Oregon, responsible for overall direction of the regional air quality agency for Lane County. Before LRAPA, he worked as environmental program manager (1994-2005) and senior environmental engineer (1981-1994) for the Oregon Department of Environmental Quality in the air quality and waste management programs.

Merlyn is a professional environmental and civil engineer, with B.S. and M.S. degrees from Oregon State University and the University of Portland. He is a Trustee of the American Academy of Environmental Engineers & Scientists and a Fellow of the Air & Waste Management Association. Merlyn was the 2012 International President of the Air & Waste Management Association. He currently serves as the 2016 Past-President of the National Association of Clean Air Agencies (NACAA), the organization of state and local air directors in the U.S. Merlyn also serves as Co-Chair of the NACAA Agriculture Committee and was recently appointed to a two-year (2016-2018) term on the USDA Agricultural Air Quality Task Force.

Merlyn and his wife Martha have five children and five grandchildren. The family enjoys running, walking and cycling on the paths around Eugene, and flyfishing the streams and lakes of Oregon. Martha and Merlyn are currently experiencing (since September 2013) the joys of driving electric vehicles.

Honorary Member

George Hawkins

George Hawkins serves as Chief Executive Officer of DC Water. Mr. Hawkins is transforming DC Water into an innovative, customer-oriented enterprise. DC Water is implementing the $2.6 billion Clean Rivers Project to nearly eliminate combined sewer overflows, investing $950 million to reduce nutrients for the Chesapeake Bay, and finishing a $470 million waste-to-energy program to produce a marketable nutrient and generate 13 megawatts of green power. George has also tripled the program to replace water infrastructure.

DC Water has been the recipient of almost every major award in the industry, including most recently, the 2016 US Water Prize for its resource recovery efforts.

DC Water is also driving a robust innovations program, focused on customer engagement, vibrant social media, research and development, and in product development and licensing. George has also launched DC Water Works – a program to encourage local workforce hiring.

George has held executive positions in state and municipal government, environmental and community groups, US EPA and private law practice. Mr. Hawkins has received many awards for his public service, including the 2014 Public Official of the Year Award from Governing Magazine and Business Leader and Public Leader Awards from the DC Chamber of Commerce and DC Business and Industry Association. Mr. Hawkins graduated from Princeton University and Harvard Law School. Mr. Hawkins teaches Environmental Law and Policy at Princeton University.

International Honorary Member

Eran Friedler, D.Sc.

Eran Friedler is an Associate Professor in the Faculty of Civil and Environmental Engineering in the Technion – Israel Institute of Technology. He holds his BSc (Agricultural Sciences - Soil and Water) from the Hebrew University and his DSc (Environmental Engineering) from the Technion. He was a post-doctoral fellow at the Department of Civil Engineering in Imperial College of Science, London. He worked in a consulting firm performing studies that served as basis for new environmental policies.

Friedler joined the Technion in 2010. From 2014, he served as the Vice Dean for Undergraduate Studies in the Faculty of Civil & Environmental Engineering. He is also a Visiting Professor at Shantou University, China. He is a member of several national steering committees on environmental regulation, science and education. He was the scientific advisor of a water technicians course in Kakuma Refugee Camp, Kenya, organized by IsraAid (Israel forum for international humanitarian aid). He is a member of the Urban Storm Water Harvesting group of the Joint Committee of Urban Drainage of IWA & IAHR, and an Associate Editor of *Urban Water Journal*.

Friedler devotes his research efforts to conceive, investigate and develop sustainable future urban water regime. He develops new scientific and applied concepts for the establishment of an integrated urban water cycle, where alternative water sources are interlaced with existing urban water/wastewater infrastructure. Among these, his research on greywater reuse puts him among the leading researchers on the subject. He is a co-author of the book *Greywater Reuse* (CRC Press and IWA Publishing). He has given invited talks on greywater reuse in conferences and invited to international forums of experts.

International Honorary Member

Marcos von Sperling, Ph.D.

Marcos von Sperling is a civil engineer working in the field of wastewater treatment and water pollution control for about 37 years. He has a PhD in Environmental Engineering (Imperial College London, 1990) and is a Full Professor at the Department of Sanitary and Environmental Engineering of the Federal University of Minas Gerais, Brazil.

Most of his activities are directed to sanitation in developing countries. One of his most widely recognized initiatives was the publication, via International Water Association (IWA) Publishing, of a comprehensive textbook entitled *Biological Wastewater Treatment in Warm Climate Regions*, which was further split into six different books (also available in Portuguese and Spanish). With these books, he pioneered the initiative within IWA of granting open access to texts of interest for developing countries. He is Editor of the IWA Journal on Water Sanitation and Hygiene for Development and was chair of the IWA specialist group on Wastewater Pond Technology.

With the World Health Organization, he collaborated on books and the development and reviewing of guidelines. He is currently involved in the "Global Water Pathogens Project", led by Unesco and Michigan State University. He has also close links with Unesco-IHE (Institute for Water Education), Delft, The Netherlands, where he is a Guest Lecturer.

Within his university he has already been Head of Department, coordinator of undergraduate and graduate courses and supervisor of more than 50 graduate students. He was one of the two founders of the Center for Research and Training on Sanitation, that is probably the most advanced wastewater experimental center in Latin American.

He has already received several academic awards, including IWA Fellow, laurel of merit from the Brazilian Council of Engineers and medal of merit from the Minas Gerais Council of Engineers.

Excellence in Environmental Engineering Education

James H. Mihelcic, Ph.D., BCEEM

James R. Mihelcic is the Samuel L. and Julia M. Flom Professor in the Department of Civil & Environmental Engineering at the University of South Florida (Tampa). He is also the Director of the International Development Engineering Program and the National Research Center for Reinventing Aging Infrastructure for Nutrient Management.

Dr. Mihelcic is internationally recognized for leading efforts to integrate concepts of sustainability and global awareness into education, practice, and research on management of water and wastewater. He has also trained many engineers who work to provide water, sanitation, and hygiene (WaSH) to developing world communities.

Dr. Mihelcic is a Board Certified Environmental Engineering Member (BCEEM) and a Fellow with the Association of Environmental Engineering and Science Professors (AEESP) and the Water Environment Federation (WEF). He is a past president and Board Member of AEESP, a past Board Trustee with AAEES, and recently completed a second term serving on EPA's Chartered Science Advisory Board. He is lead author for several widely adopted engineering textbooks: *Fundamentals of Environmental Engineering* (John Wiley & Sons); *Field Guide in Environmental Engineering for Development Workers: Water, Sanitation, Indoor Air* (ASCE Press); and, *Environmental Engineering: Fundamentals, Sustainability, Design* (John Wiley & Sons). He also led development of a paper recently published in *Environmental Engineering Science* on the future role that environmental engineering can have to achieve sustainability in developing regions that supports the National Academies Committee on Grand Challenges in Environmental Engineering and Science for the 21st Century.

Innovyze Excellence in Computational Hydraulics/Hydrology Award

Qian Zhang, Ph.D.; Advisor: William P. Ball, Ph.D.

Dr. Qian Zhang is currently a watershed data analyst (assistant research scientist) with the University of Maryland Center for Environmental Science at the US Environmental Protection Agency's Chesapeake Bay Program (Annapolis, MD). His main responsibility is to work with scientists, professionals, and managers in the Chesapeake Bay partnership to explore natural and anthropogenic-based causes behind the observed current status and long-term trends in the water quality of the streams and rivers in the Chesapeake Bay watershed. This collaborative effort is critical to defining the success of the Chesapeake Bay and watershed restoration efforts to date and to making science-based management decisions in the foreseeable future.

Shortly before joining the Chesapeake Bay Program in September 2016, Zhang obtained his Ph.D degree from the Department of Geography and Environmental Engineering at Johns Hopkins University. Under the advisement of Prof. Bill Ball, Zhang's doctoral dissertation focused on applying scientific principles (including landscape hydrology, contaminant transport, and nutrient biogeochemistry) and statistical approaches to quantify nutrient and sediment export from major tributaries to the Chesapeake Bay. Through his dissertation research, Zhang has delivered a number of scientific products, including six journal publications and three additional manuscripts.

Prior to obtaining his doctoral degree, Zhang obtained two Master of Science degrees from Johns Hopkins University, one in environmental engineering and the other in statistics. He obtained his bachelor's degree in environmental engineering at the Nanyang Technological University in Singapore in 2009. Originally from China, Dr. Zhang currently lives in Maryland with his wife and two little sons.

The 2016-2017 EESF/AEESP Student Video Competition

The Environmental Engineering and Science Foundation and the Association of Environmental Engineering & Science Professors conducted the 2016-2017 EESF/ AEESP Student Video Competition. We are pleased to announce the top three winners of this year's competition.

FIRST PLACE

The University of South Florida (USF) for Change Climate Change

Team members:

- Kevin Orner, Team Leader
- Jorge Calabria
- Philip Dixon
- Ryan Graydon
- Charlotte Haberstroh
- Emma Lopez
- Christy Prouty
- Laura Rodriguez-Gonzalez
- Dr. James Mihelcic, BCEEM, Faculty Advisor

SECOND PLACE

Florida International University for Take Action on Climate Change

Team members:

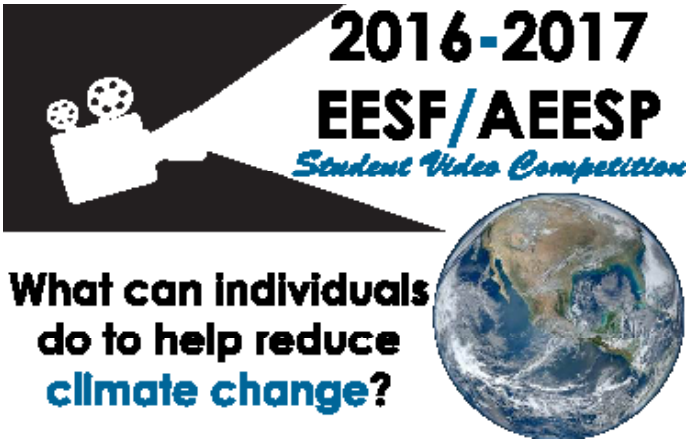
- Allyson Tombesi, Team Leader
- Sarah Solomon
- Ron Hariprashad
- Shonali Laha, Faculty Advisor

THIRD PLACE

University of Southern California for Small Changes; Big Impact

Team members:

- Autumn Gupta, Team Leader
- Cassandra Boyle
- Bryanna Wallace
- Kelly Sanders, Faculty Advisor



The winning videos can be viewed online at http://www.eesfoundation.org/student-video-competition.

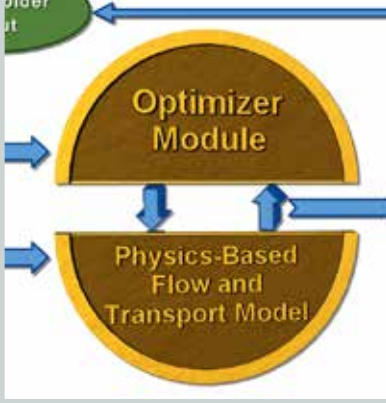
Teams of undergraduates and graduates studying environmental engineering and science were challenged to create 2-3 minute videos on the topic "what can individuals do to help reduce climate change". The target audience was 8th grade and higher students as well as the general public. Entries were evaluated on their effectiveness in reaching target audiences, creativity, accuracy, and plans for distributing the final video product. Each video also addressed the roles of Environmental Engineers and Scientists in solving climate related problems.

"The students never fail to surprise us with how they respond to the challenge," noted Professor Jim Mihelcic, faculty advisor for the USF team. "They bring a different context and a different style of messaging. You can tell they take the challenge very seriously and are passionate about making a difference for the environment."

"We had an excellent response and look forward to doing this again next year," added Mihelcic.

"The Environmental Engineering and Science Foundation is pleased to provide $1,000 and travel funding to the first place team, $750 to the 2nd place team and $500 to the 3rd place team", stated EESF Chairman Cecil Lue-Hing. "We are pleased to see that these students are so passionate about important environmental issues as they prepare to become part of the future workforce that can make a difference in this area."





2017 Excellence in Environmental Engineering and Science

The Excellence in Environmental Engineering & Science Awards Competition was launched in 1989 to recognize and promote quality projects in environmental engineering and science. For 2017, there were entries in the following categories:

- Design
- Environmental Sustainability
- Industrial Waste Practice
- Operations/Management
- Planning
- Research
- Small Projects
- University Research

Each entry is judged based on the following criteria:

1. Demonstration of a comprehensive, integrated approach that considers all environmental media, i.e., air, water, and land.
2. Quality as evidenced by the degree of user satisfaction and proven performance.
3. Originality and innovation, representing the application of new knowledge, a new application of existing knowledge, or an innovative mix of existing knowledge.
4. The complexity of the problem or situation addressed.
5. The extent to which the project contributes to, or offers the prospect of, contributing to social and economic advancement.

One Grand Prize is awarded in each category. Honor Awards are presented to other deserving entries, as determined by competition rules, in each category. The Superior Achievement for Excellence in Environmental Engineering and Science is awarded to the overall best entry in each year's competition.

The Superior Achievement Award Winner is Savron, A Division of Geosyntec Consultants, Inc., for their project, *The Evolution of STAR from Laboratory Concept to Full-Scale In Situ Implementation*. Their project, which was entered in Industrial Waste Practice, is the first in that category to win the top prize since it was established in 2012.

The Grand Prize in Industrial Waste Practice is CDM Smith for their project, *El Dorado, AR Thermal Treatment Facility Expansion*. The Grand Prize is also awarded the W. Wesley Eckenfelder Industrial Waste Management Medal sponsored by AquAeTer.

Also a first in E3S history, a single entry won a Grand Prize in three different categories. That honor goes to the Inland Empire Utilities Agency (IEUA) for their project, *Regional Water Recycling Plant No. 5 Battery Storage*. They won the Grand Prize in Environmental Sustainability, Operations/Management, and Planning.

Full profiles of the winning projects are online at http://www.aaees.org.

2017 E3S Panel of Judges

- Jack Bryck
- Mary Clyburn
- Nicholas Cooper
- Stephen Couture
- Doug Eckmann
- Vinio Floris
- Jerome Gilbert
- Jay Herskowitz
- James Law
- Farhana Mohamed
- Ochan Otim
- Webster Owen
- Vikram Pattarkine
- Peter Radosta
- Jerry Snyder
- Rich Voigt
- Thomas Wilson
- Xiaoning Zhang



Superior Achievement

Entrant
Savron, a Division of Geosyntec Consultants, Inc.

Engineer in Charge
Scott Drew, LSRP

Location
Newark, New Jersey

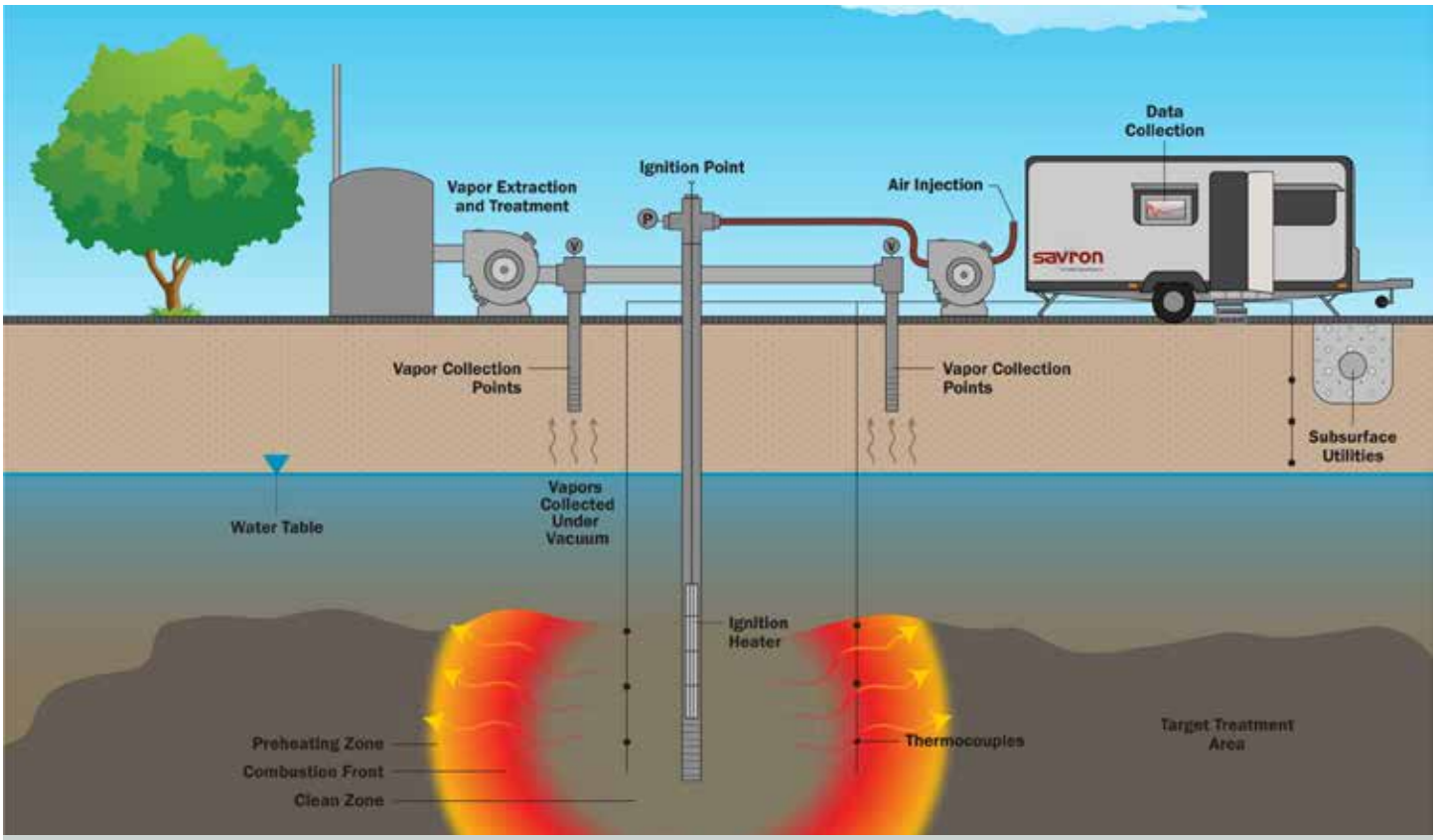
The Evolution of STAR from Laboratory Concept to Full-Scale *In Situ* Implementation

The first full-scale application of Savron's STAR technology is well underway to treat a 26-acre former coal tar processing facility as part of the re-vitalization of the Newark Ironbound district which will generate new jobs and new opportunities locally and nationally. Savron, an operating division of Geosyntec Consultants, Inc., is the exclusive provider of the patented STAR technology which is a self-sustaining process based on the principals of smoldering combustion to destroy heavy hydrocarbons.

DuPont was facing a vexing contamination problem and transitional remediation would have been costly, unsustainable, and posed significant safety concerns. DuPont contracted Geosyntec to assess alternative remedies and was introduced to the STAR technology managed by their Savron division. However, at that time, the STAR technology was in its infancy, and had only been demonstrated at the laboratory scale. Even a pilot test would require scaling up the STAR process by 100,000 times, and further, a completely untested engineering design would have to overcome many operational unknowns.

Through a series of pilot tests conducted to demonstrate "proof of concept" under field conditions, testing new specialized equipment, and to collect design information, Savron/Geosyntec gained DuPont's and regulatory agency's confidence that STAR was a viable technology and should be selected as the remedy for the site.

Savron/Geosyntec designed and/or procured the required equipment for the full-scale remedy as well as developed an innovative application strategy to minimize infrastructure costs associated with the 2,300 ignition events beneath the ground that are required to treat the targeted soil volume at the site. The project is well underway, and has conservatively destroyed over 20 metric tons of coal tar in the first 5,500 cubic yards of soil. The project will be completed by mid 2018.



Schematic of Full Scale

A 2-inch ignition point (IP) with a 6 to 12-inch stainless steel slotted screen is installed at the target depth. An in-well specially designed cartridge heater is inserted in the well and heated for a short period (2 to 12 hours) to initiate combustion. Air is injected into the IP and combustion gases are extracted under vacuum, monitored and then treated.

Thermocouples are used to verify combustion temperatures (upwards of 1200°C). As the combustion front moves out, it leaves behind cool and dry soil, even under the water table.

Treatment Effectiveness
These photographs show before and after pictures of core samples collected from a deep treatment cell at a depth of 25 - 30 feet below ground surface. The top two photos clearly show the obvious heavy contaminated sands in the aquifer. The bottom 2 photos show soils that are completely treated. The reddish colour is due to oxidation of iron minerals in the sand.

Site in 1954.

The Site is a former chemical production and coal tar processing facility, which produced picric, acid, road and roofing tar, cresols, phenols, naphthalene and other derivatives. Operations began in approximately 1862. All production processes ceased in 1983 and by 1986 production facilities were dismantled. Lagoons located on the west and north boundaries (respectively, bottom and right of the photo), and in the center of the site, along with spills associated with the tank farms, are the suspected sources for the soil and groundwater contamination.

Grand Prize Design

Entrant
Carollo Engineers, Inc.

Engineer in Charge
John Fraser, P.E.

Location
Denver, Colorado

Robert W. Hite Treatment Facility South Secondary Improvements Project

In 2005, the Colorado Water Quality Control Commission (CWQCC) adopted more stringent criteria to protect Colorado streams, including the South Platte River. The Metro Wastewater Reclamation District (MWRD), which provides wastewater services to approximately 1.8 million people throughout greater Denver, handles 130 mgd of wastewater at the Robert W. Hite Treatment Facility (RWHTF).

The RWHTF is the largest wastewater plant between the Mississippi River and the west coast and is rated for a 220 mgd treatment capacity. More than 95 percent of the raw wastewater pollutants are removed at the RWHTF prior to discharging to the South Platte River. The revised regulations required MWRD to replace the 90-mgd High Purity Oxygen System (HiPOS) with a new 114 mgd Biological Nutrient Removal (BNR) process.

The 114 mgd portion of the 220 mgd plant was completed for a cost of less than $1.50 per gallon, well below the national average of $2 to $4. The new plant was designed, constructed, and started up ahead of its compliance schedule of December 31, 2014. Carollo Engineers served as engineers while Wester Summit/McCarthy (WSMC) were the construction contractors.

The RWHTF South Secondary Improvements projects represents the single largest HiPOS to BNR conversion ever completed in the U.S.

TOP: The sun rises over the new South Aeration Complex aeration basins capable of treating 114-mgd to less than 1.75 mg/L ammonia, 7.6 mg/L nitrogen, and is set-up to provide 1 mg/L effluent total phosphorus in the future.

RIGHT: One of ten 140-foot diameter secondary clarifiers retrofit with maze type EDIs and suction header type sludge withdrawal mechanisms to increase throughput capacity by 25 percent.

Groundwater Reliability Improvement Project (GRIP)

Grand Prize Design

Entrant
Water Replenishment District of Southern California (WRD)

Engineer in Charge
Robb Whitaker, P.E.

Location
Pico Rivera, California

The Water Replenishment District of Southern California (WRD) set a goal to eliminate use of water imported from the Colorado River and Sacramento-San Joaquin Delta for groundwater replenishment and replace it with locally sustainable water supply sources. As part of WRD's Water Independence Now (WIN) Program, The Groundwater Reliability Project (GRIP) was developed.

Currently under construction, GRIP will consist of a state-of-the-art advanced water treatment facility (AWTF) to produce high-quality water. The facility will include a visitor and education center, renewable energy facilities, a water transmission pipeline to the Montebello Forebay Spreading Grounds, and a brine discharge pipeline. GRIP will contribute to a new, local, drought-proof, high-quality recycled water supply for groundwater replenishment in the Central Basin, and will offset use of imported water for replenishment within WRD's service area which includes over ten percent of California's population residing in 43 cities in southern Los Angeles County.

WRD selected a design-build team led by J.F. Shea Construction, Inc., Tetra Tech and PERC Water to facilitate the design and construction of GRIP. The project is designed to meet a Leadership in Energy and Environmental Design (LEED) Gold certification and incorporates many urban greening and public access features including demonstration gardens, walking paths, native plantings and trees. The AWTF facility will utilize porous pavement, bioretention basins, pipeline, and infiltration to capture, convey, and recharge stormwater. Construction got underway in 2016 with an expected completion in Summer 2018.

RIGHT: GRIP Site. The GRIP AWTF is being built on a 5.2 acre property adjacent to the San Gabriel River in the City of Pico Rivera.

BOTTOM: GRIP Architectural Rendering of Learning Center, AWTF and Grounds

Regional Water Recycling Plant No. 5 Battery Storage

Grand Prize
Environmental Sustainability
Planning
Operations/Management

Entrant
Inland Empire Utilities Agency (IEUA)

Engineer in Charge
Chris Berch, P.E., BCEE

Location
Chino, California

In 2015, the Inland Empire Utilities Agency (IEUA) partnered with Advanced Microgrid Solutions (AMS) to install 3.65 MW of state-of-the-art battery storage across six of IEUA's regional water-recycling facilities and pump stations across its service area. The storage system will help integrate IEUA's renewable resources, which include 3.5 MW of solar, 1 MW of wind, and 2.8 MW of biofuel cell generation.

In June 2016, IEUA's Regional Water Recycling Plant Number 5 (RP-5) was the first to implement battery storage. A total of 1 MWh of Tesla batteries was successfully integrated into the facility's electrical profile. The battery storage system is automated to monitor the generation of each renewable power source and the amount of power imported from the grid in real time, then determine the most cost-effective method of supplying the power needed to operate the facility.

AMS' modeling analysis indicates that the project will reduce IUEA's peak demand from the electric grid by as much as 14 percent and decrease the total energy costs by 5-10 percent. When implemented at all six sites, the batteries are expected to reduce IEUA's cost energy by as much as $230,000 per year. Through seven months of operation at RP-5, the monthly energy cost savings ranged between 9-19% has been achieved - far exceeding expectations.

Because of ongoing reduced operational costs and the structured partnership with AMS, IEUA expended no capital outlay for the system which ensures continuous savings for IEUA and its ratepayers.

TOP: IEUA's LEED Platinum Certified headquarters is located adjacent to the RP-5 facility. Both facilities operate on the same electrical meter and, with the integration of the battery storage system, are completely self-sustainable on renewable power generated on-site during periods of the day.

BOTTOM: Construction of the RP-5 battery storage project was completed in June 2016.

El Dorado, AR Thermal Treatment Facility Expansion

Grand Prize
Industrial Waste Practice

Entrant
CDM Smith

Engineer in Charge
Robert Burkard, P.E., BCEE

Location
El Dorado, Arkansas

Clean Harbors' $120 million state-of-the-art El Dorado, Arkansas Thermal Treatment Plant Expansion is the first commercial hazardous waste incinerator to come online in nearly 20 years. The expansion adds a third incinerator to the 370-acre facility, which specializes in high-temperature destruction of hazardous and non-hazardous materials. The advanced new equipment nearly doubles the facility's capacity from 90,000 tons to approximately 160,000 tons of material annually.

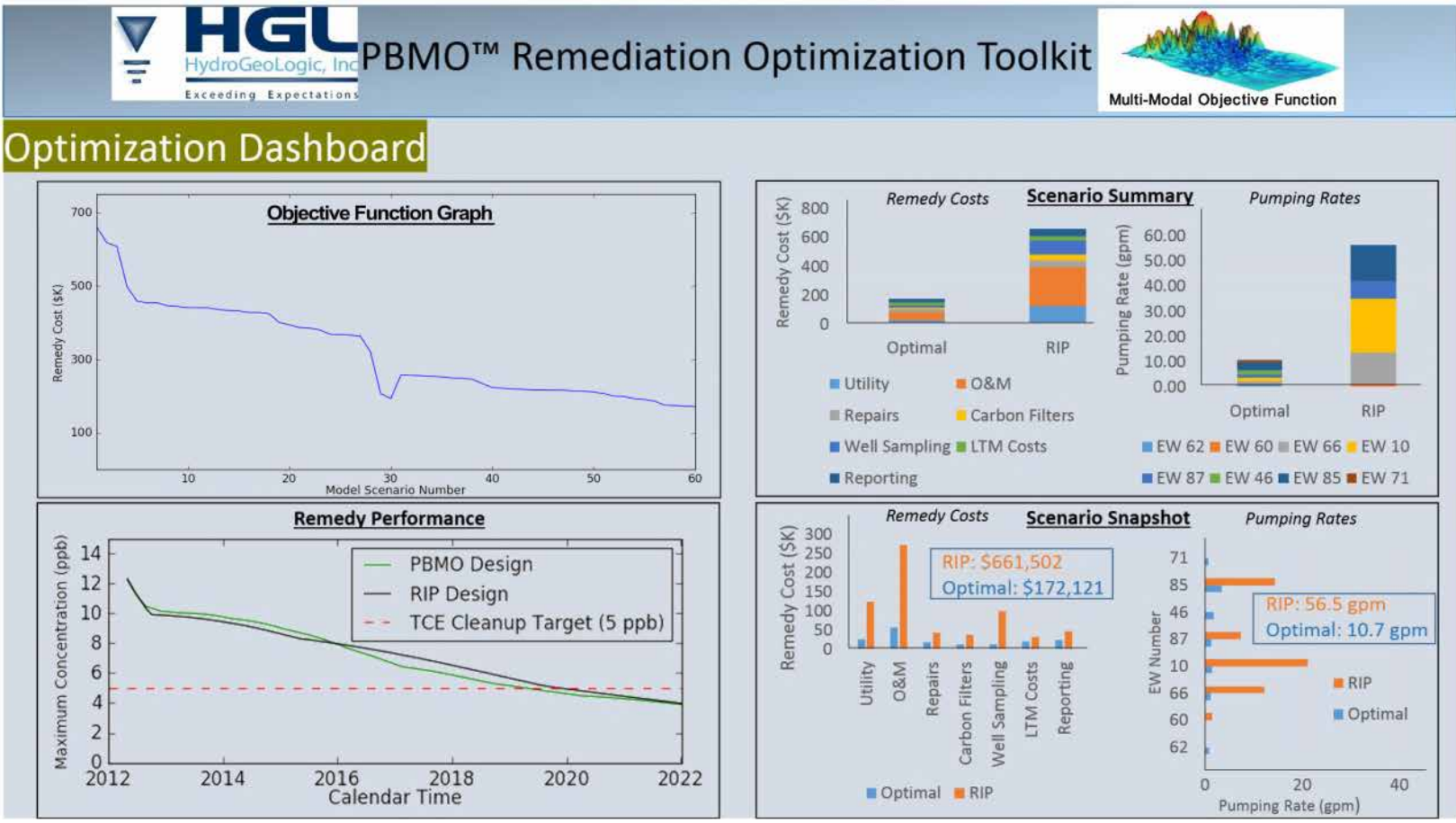
The facility is designed to be North America's most technologically advanced hazardous waste incinerator and employs air emissions control technology that meets the most stringent air emissions standards under the Federal Clean Air Act.

CDM Smith coordinated with Clean Harbors from design through start-up to deliver the facility on time, within budget, and according to specifications. The project was completed in January of 2017 and represents a major investment to serve a growing industrial sector with an environmentally responsible and cost-effective means of disposing hazardous waste streams.

In addition to meeting the increasing need for safe, reliable, and environmentally compliant options for the disposal of hazardous and industrial wastes, the project also delivered economic benefits to the city of El Dorado and Arkansas through the creation of 120 well-paying new jobs.

RIGHT: Successful design and construction of this project involved the orchestration of three engineering subconsultants and 26 major subcontractors and vendors to safely deliver the new process ahead of schedule and within budget.

BOTTOM: As the first of its kind built in America in more than 20 years, this facility was designed from inception to comply with emissions criteria that no other facility of its kind was designed for, representing a once-in-a-generation achievement.



Grand Prize Research

Entrant
HydroGeoLogic, Inc.

Engineer in Charge
Larry M. Deschaine, Ph.D., P.E.
Varut Guvanasen, Ph.D., P.E.

Location
Reston, Virginia

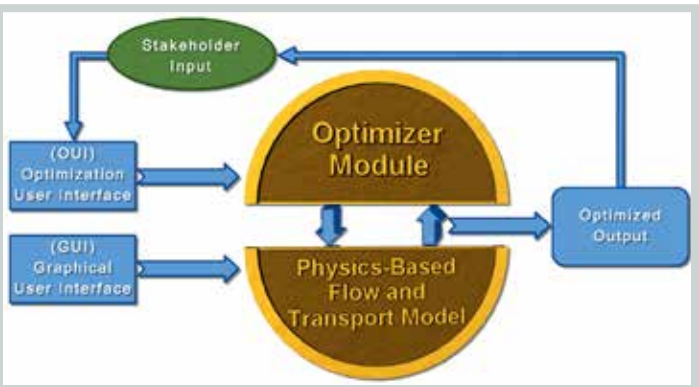
Physics-Based Management Optimization Technology for Supporting Environmental and Water Resource Management

Physics-Based Management Optimization (PBMO™) technology was developed by HydroGeoLogic, Inc. (HGL) to link environmental modeling with management optimization. HGL, an engineering and water resources services firm, also conducts research and development (R&D) and has created cutting-edge software (MODFLOW-SURFACT™ and MODHMS®) for integrated groundwater-surface water modeling. The software has been licensed for use in 50 countries. Over the past several years, HGL's R&D efforts have focused on linking formal numerical optimization techniques with physics-based flow and transport models, culminating in the PBMO™.

PBMO™ captures important site physics and financial constraints to produce optimal solutions that satisfy multiple competing objectives. Applied to environmental restoration, PBMO™ identifies optimal remedy design and operation approaches that lead to timely and cost-effective cleanups. For water resource management, the tool balances water needs with resource protection. The technology has been configured to run on multi-core PCs in a cloud-based environment that allows it to solve large, complex environmental and water resources problems rapidly.

PBMO™ was developed for a wide range of applications. It can address remediation challenges with mass transfers between interconnected media and can reduce the environmental footprint of remedial systems by minimizing cleanup times and reducing capital and energy inputs.

Benefits from PBMO™ applications include reduction of potential human health risks, conservation of natural resources, realization of significant cost savings, timely attainment of cleanup goals, and facilitation of stakeholder consensus.



TOP: PBMO™ Optimization Dashboard for Facilitating Client/Stakeholder Presentation and Interaction

RIGHT: PBMO™ Medallion Conceptualization

Innovative Approach for Implementing Performance-Based Remediation Project

Grand Prize
Small Projects

Entrant
HydroGeoLogic, Inc.

Engineer in Charge
Roy Evans, P.E.
Varut Guvanasen, Ph.D., P.E.

Location
Former Fort Ord, California

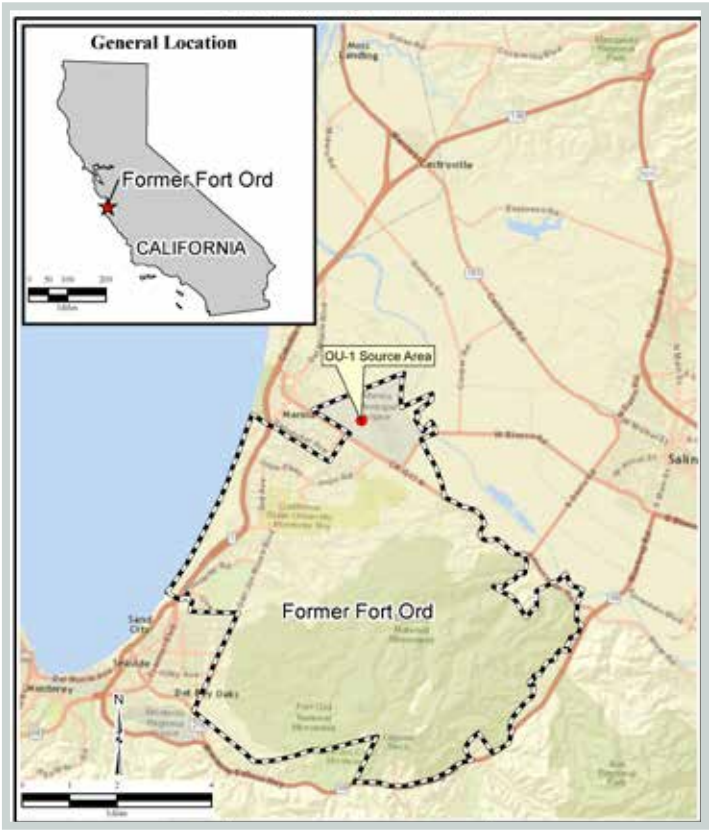
In a partnership with U.S. Army Corps of Engineers-Sacramento District, the Army Base Realignment and Closure Office, and the University of California Natural Reserve System, HydroGeoLogic, Inc. (HGL) was tasked with the complete environmental cleanup of Operable Unit 1 (OU-1) located in the northernmost portion of the Former Fort Ord.

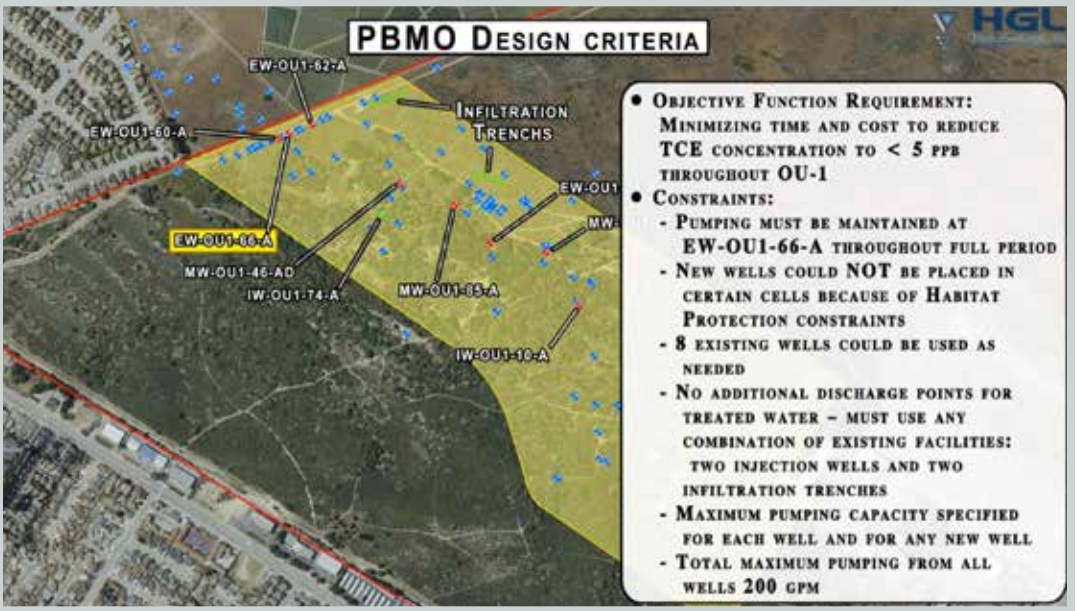
Fort Ord was a U.S. Army Garrison covering over 28,000 acres in Monterey County, California. Closed in 1994, fire training exercises over a twenty year span had released volatile organic compounds to groundwater in OU-1.

HGL and its partners successfully implemented integrated approaches and achieved the Army's objective of remediating the site, despite the discovery that the plume had extended off site approximately 1,400 feet beyond the previously estimated limit. Other challenges included conserving FONR habitat and plant species and not affecting the migration path of the nearby OU-Carbon Tetrachloride Plume (OU-CTET). The project team achieved the OU-1 Record of Decision (ROD) cleanup goals in 2014, three years before the 2017 date estimated in the ROD, completed attainment monitoring in 2015, and obtained remediation-action-completion concurrence from regulatory agencies in 2016.

To achieve the cleanup goal, the HGL-led project team conducted optimization efforts throughout the operation of the pump and treat remedy, including development and application of an original and innovative Physics-Based Management Optimization (PBMO™) model to reduce the cost and duration of the cleanup. PBMO™ was used with the calibrated OU-1 MODFLOW-SURFACT™ model to evaluate alternative pumping strategies using the existing extraction well network. PBMO™ identified an optimal solution that reduced the cleanup time without affecting the endangered Sand Gilia and threatened Monterey Spineflower species in the FONR.

Once the remediation system is removed, University of California researchers can complete experiments on habitat restoration, invasive floral species management, and survival of native Monterey Bay maritime chaparral flora and fauna adjacent to disturbed areas.





TOP: Location of Operable Unit 1. Operable Unit 1 (or OU1) is located in the northernmost portion of the former Fort Ord. OU1 comprises the contaminated groundwater plume emanating from a former fire drill area that operated from 1962 to 1985 for the Fort Ord Fire Department. Ten volatile organic compounds were listed as chemicals of concern (COCs) at the site, but TCE is the only COC to exceed the cleanup target since 2008

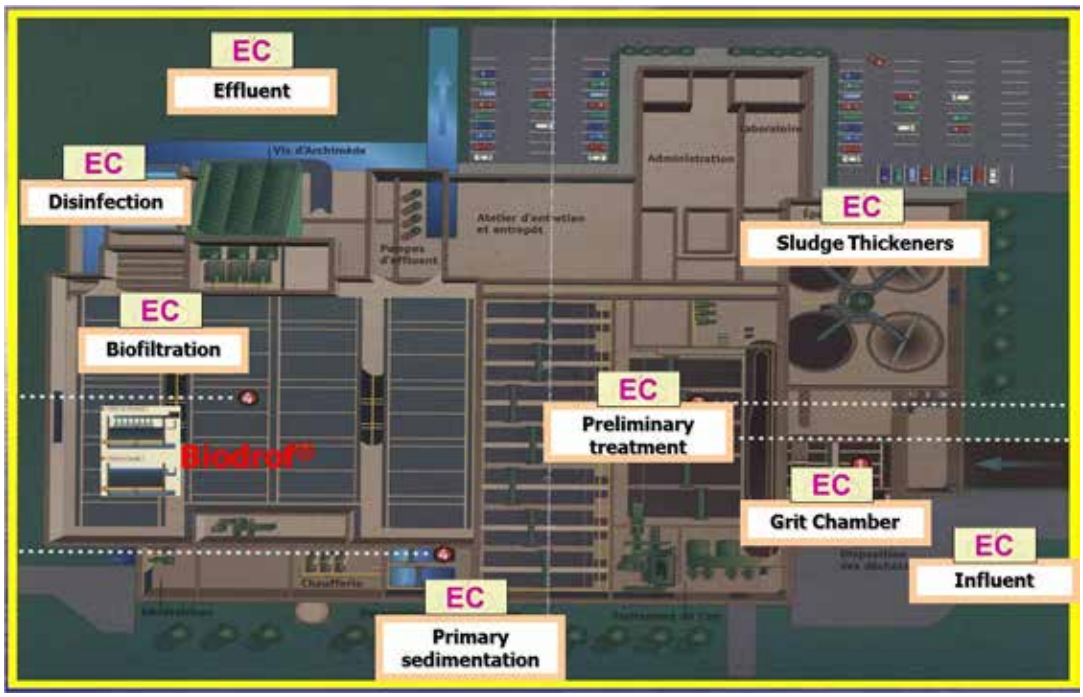
RIGHT: Physics-Based Management Optimization Design Criteria. PBMO Design Criteria which included objective function requirements and constraints.

Grand Prize
University Research

Entrant
Institut National de la Recherche Scientific

Engineer in Charge
Dr. Satinder Kaur Brar
Dr. Rao Y. Surampalli, P.E., BCEE

Location
Quebec, Canada



Novel and Advanced Hybrid Oxidation and Enzymatic Technologies for Emerging Trace Environmental Contaminants

Population increases have led to the release of a myriad of emerging trace contaminants (ETCs) which could ultimately have an adverse impact on living organisms. Their presence in the environment is mainly attributed to the discharge of treated wastewater and land application of wastewater biosolids. With poor degradation occurring at WWTPs, new treatment methods for treating these compounds is crucial.

The research team has conceptualized the use of greener advanced oxidation methods along with enzymatic processes to achieve hybrid methods which can impact ETCs. Enzymes, such as ligninolytic enzymes produced by wood degrading fungi were used in combination with different types of advanced oxidation methods, such as ultrasonication, encapsulation of enzyme in nano-sized/micro-sized adsorbent particles, i.e. biochar and integrating enzyme and adsorbent particles into electrospun membrane. These integrated hybrid configurations resulted in transformation of these compounds present in soils and water into non-toxic by-products. The use of these hybrid technologies accomplished treatment in such a way that potentially non-toxic products were obtained. Thus, use of enzymatic techniques along with the advanced oxidation and/or biochar impregnation methods definitely had an advantage over stand-alone physical or chemical treatment methods.

Enzymatic treatment with advanced oxidation processes, membrane separation and nano-sized adsorbent materials for removal of PhACs are being tested for the first time. These new systems can retrofit the tertiary treatment stage of the WWTPs to strip the effluent from micropollutants. Also, they can be applied for in situ and ex-situ treatment of contaminated soils with micropollutants. In addition, pharmaceutical and chemical companies can take advantage of these systems for treating their wastewater and prevent releasing the compounds into environment. The research dealt with various complexities, such as organic matrix interferences during analysis; complexation of contaminants with metals; enzyme production costs; and optimization of processes to release non-toxic compounds which were overcome by evolving different strategies.

TOP: Layout of the treatment steps of wastewater treatment plant located in Quebec, Canada with different sampling points (1: Influent; 2: Grit influent; 3: Primary sludge; 4: Secondary sludge; 5: Effluent; 6: Mixed thickened sludge; 7: Dewatered sludge). The samples were taken at these points to analyze different emerging contaminants in the two phases: solid and liquid obtained by centrifugation of the samples to determine their concentration in each of the phases.

RIGHT: Effect of chlortetracycline on nitrification in aerobic reactor. High concentrations of CTC (50 and 100 mg CTC/L) are salted out from aerobic reactor during nitrification experiments. Even though CTC is highly soluble in water (8.6 mg/L), higher metal complexing and high adsorption property to sludge solids results in lower solubility which lead to salting out of CTC.

Honor Award
Design

Entrant
Greeley and Hansen

Engineer in Charge
Paul Vogel, P.E.

Location
Skokie, Illinois

O'Brien WRP Adds Wastewater UV Disinfection System

The Metropolitan Water Reclamation District of Greater Chicago (MWRD) added a new ultraviolet (UV) disinfection system to the Terrence J. O'Brien Water Reclamation Plant (WRP). The cost-saving design of the $61.7 million system features a cutting-edge application of UV technology for the world's largest wastewater UV system by flow capacity. The project exceeded MWRD requirements for flexible operation and sustainable design, while helping to make Chicago area waterways cleaner, safer, and more suitable for community development and recreational use.

MWRD engaged Greeley and Hansen as the lead engineer responsible for designing and overseeing construction of the new installation. All design and construction goals were on schedule, well under budget, and without interrupting wastewater treatment operations or removing the WRP from service. The O'Brien WRP UV project was initiated in April 2012 and was operational in April 2016.

Serving more than 1.3 million Chicago-area residents within 143 square miles, the O'Brien WRP UV disinfection system is capable of treating 450 million gallons of water per day.

In addition to meeting operational requirements, the O'Brien WRP UV system enabled MWRD to fulfill commitments to the Illinois EPA, local and state stakeholders, and environmental groups while improving the quality of water throughout the Chicago Area Water System by protecting the region's drinking water supply in Lake Michigan and improving long-term public safety for Chicago-area citizens.

The new UV disinfection system at the MWRD's Terrence J. O'Brien Water Reclamation Plant (WRP) is the world's largest wastewater UV disinfection system by flow.

Honor Award
Environmental Sustainability

Entrant
Housing & Development Board (Singapore)

Engineer in Charge
Mr. Lim Han, Vincent

Location
Punggol Eco-Town, Singapore

A Biophilic MyWaterway@Punggol - Innovative Floating Wetlands and Freshwater-Tolerant Mangroves

MyWaterway@Punggol is Singapore's first and longest man-made waterway. The Freshwater-Tolerant Mangroves and Floating Wetland System are two of the key sustainable innovations developed by the Housing & Development Board (HDB) for the waterway.

The freshwater-tolerant mangroves comprise 35 different species that were tested and proven resilient under the waterway's freshwater conditions. HDB deliberately chose mangroves with an endangered status to help improve and restore the native mangroves.

The floating wetland system was borne out of an idea to better utilize the vast water area to intensify greenery in the waterway. Inspired by the organic form of a honeycomb, HDB created a one-of-a-kind floating system, which comprises wetlands plants cultivated in hexagonal buoyant modules that can be easily assembled and hoisted onto the waterway. These "green honeycombs" are found near key visitor spots along the waterway, to encourage visitors to interact with the greenery and nature.

The 15 wetland species cultivated at the floating wetland system were carefully chosen for their phyto-remediation ability - HDB has conducted numerous experiments that affirmed the ability of these wetland plants to effectively absorb excessive nutrients and pollutants from the water. Tests conducted at the waterway showed that these wetland plants were able to improve water quality by up to 30%.

With the lusher and varied greenery, as well as cleaner water brought about by these green efforts, Punggol Waterway has since transformed into a conducive environment for biodiversity to thrive.

The freshwater-tolerant mangroves planted along the embankments of MyWaterway@Punggol that brings our natural heritage to the doorsteps of public housing developments.

Honor Award
Environmental Sustainability

Entrant
Orange County Sanitation District
Orange County Water District

Engineer in Charge
Rob Thompson, P.E.

Location
Fountain Valley, California

Groundwater Replenishment System Final Expansion Feasibility Study

Orange County Sanitation District (OCSD)'s and the Orange County Water District (OCWD)'s Groundwater Replenishment System (GWRS) is a water recycling project that supplements existing water supplies by providing a new, reliable, high-quality source of water to recharge the Orange County Groundwater Basin and to protect it from seawater intrusion.

OCSD and OCWD have partnered for the past 18 years to enable the GWRS to provide a drought-proof water supply for Orange County. OCSD currently delivers all secondary effluent from its Fountain Valley Plant No. 1 to the facility which produces 100 mgd of potable reuse water.

The effluent from the OCSD's Plant No. 2 facility in Huntington Beach is released into the Pacific Ocean. OCWD has anticipated a Final Expansion of GWRS which will require all Plant No. 1 secondary effluent and all reclaimable secondary effluent from OCSD's Plant No. 2 to produce 130 mgd of potable reuse water.

The GWRS Final Expansion Feasibility Study looked at treatment and conveyance modifications needed to support the GWRS Final Expansion as well as potential environmental impacts and permit modifications attributed to additional recycling by OCSD. By supporting the GWRS Final Expansion, OCSD and OCWD will be able to recycle all current reclaimable wastewater flow in OCSD's service area.

Aerial Image or Orange County Water District (OCWD) and Orange County Sanitation District (OCSD) Plant No. 1 and Plant No. 2.

Honor Award
Planning

Entrant
CH2M

Engineer in Charge
Evelio Agustin, P.E.

Location
Countywide, Miami Dade County, Florida

Miami-Dade Ocean Outfall Legislation

Miami-Dade Water and Sewer Department (WASD) is the largest water and sewer utility in the southeastern United States and operates three large wastewater treatment plants. WASD treats 320 mgd, with approximately half discharging into the ocean. A 2008 Florida law mandated wastewater utilities using ocean outfalls to reduce nutrient discharges by 2018, and cease normal use of outfalls while reusing 60 percent of wastewater flows by 2025. As a result, WASD initiated the Ocean Outfall Legislation (OOL) Program.

In 2014, CH2M began working with WASD as the program manager for the $6 billion, 11-year (OOL) Program. CH2M will manage the overall delivery of a comprehensive, technically sound, long-term program that encompasses the design, procurement, construction, and commissioning of 63 capital projects, including upgrading a very complex conveyance system with more than 1,400 pump stations, upgrading three wastewater treatment plants, and building a new wastewater plant to account for climate change variables in Miami.

It is estimated that the OOL Program will contribute 30,000+ jobs to the county during its implementation.

The success of the OOL Program relies on an alternative disposal method: deep injection wells capable of receiving more than 15 mgd of treated wastewater each.

Honor Award
Planning

Entrant
Orange County Sanitation District

Engineer in Charge
Robert C. Thompson

Location
Fountain Valley, California

Biosolids Master Plan

The Biosolids Master Plan (BMP) is the result of a year-long planning project that began in January 2016 by the Orange County Sanitation District (OCSD) and its consultants, Black & Veatch and Brown and Caldwell. The BMP will expand the process of the beneficial use of biosolids and resource recovery.

Producing the plan required considerable time to survey the biosolids market; evaluate technologies, identify challenges, drivers and regulations; examine similarly-sized treatment works in the Western US; and factor in location-specific seismic risks and other environmental and community concerns.

One focus was on ways to explore the capabilities of Plant No. 2 in Huntington Beach to receive pre-processed food waste for co-digestion and to develop digestion technology alternatives. Temperature-phased anaerobic digestion was the recommended technology that offers several important synergies for OCSD, including excellent compatibility for receiving food waste and meeting the complexity of OCSD's existing operational needs and challenges.

The BMP continues best practice odor and emissions control by incorporating mitigation elements in the recommended program, including those for food waste. Further, Class A biosolids production will result in better odor control and fewer emissions from product hauling. The implementation of food waste receiving is significant and timely because, per state law, commercial food waste may no longer be hauled to a landfill. With planned food waste facilities at Plant No. 2 in Huntington Beach, preprocessors of food waste will now have a product outlet, and it can be beneficially used for increased biogas and energy production.

Ultimately, the BMP meets OCSD's goal of planning future biosolids management options and capital improvement program projects over a 20-year period. Additionally, it's a roadmap of critical steps for the development and advancement of a truly sustainable biosolids management program.

Scope of Work

Honor Award
Research

Entrant
Sanitation Districts of Los Angeles County

Engineer in Charge
Grace Robinson Hyde, P.E., BCEE

Location
Whittier, California

Biotrickling Filter for Digester Gas Hydrogen Sulfide Control at the JWPCP

Hydrogen sulfide (H_2S) concentrations in digester gas can be an odor issue and intensify metal corrosion and local pollution regulations require that the concentrations be controlled to minimize emissions of oxides of sulfur if the digester gas is combusted. Due to these issues, control of H_2S in digester gas has become an important aspect in the operation of anaerobic digesters. Because of the expense and limitations of existing H_2S control measures the Sanitation Districts of Los Angeles County (Sanitation Districts) has developed a biological system that is economical and relatively easy to operate.

Development work was done at the Districts' Joint Water Pollution Control Plant (JWPCP), a facility which generates approximately 7.5 million cubic feet of digester gas per day which is sufficient to generate 20 MW in a combined cycle power plant. To meet the South Coast Air Quality District's regulation for H_2S of 40 ppm for digester gas that is to be combusted, the Districts added ferrous chloride to react and combine with the sulfides in the digesting sludge.

The new state-of-the-art system uses sulfur oxidizing bacteria inside a biotrickling filter to remove H_2S directly from digester gas, a novel process because it employs bacteria that are already present in a wastewater treatment facility.

After success with a pilot system, a full-scale biotrickling filter system that treats 300 cubic feet per minute of digester gas was constructed in April 2015 and has been operating effectively ever since, saving the plant $500 per day in chemical costs and consistently removing over 98% of the inlet H_2S. Plant operators are pleased with the ease of use, the minimal maintenance required, and the significant reduction in costs.

Since high concentrations of digester gas H_2S can be a major issue for wastewater treatment facilities, this technology requires a relatively small footprint and does not need chemical usage or significant amounts of energy. The results generated by this project should provide assurance to wastewater utilities that would consider the use of this technology.


Finished Biotrickling filter system.

Honor Award
Small Projects

Entrant
City of Scottsdale & GHD, Inc.

Engineer in Charge
Bill Roberts, P.E., BCEE

Location
Scottsdale, Arizona

Scottsdale Booster Pump Station 71

Once used as a fire station and later as an EMT facility, the Scottsdale Booster Pump Station 71 exemplifies how a City can maximize the value of infrastructure projects for the benefit of the public. The new multi-use facility comprises a groundwater well, a 10 mgd booster station, an odor control station for the region's sewer collection system, site improvements around an existing building that houses emergency medical technicians and City personnel, and landscaping and wall improvements that complement one of Scottsdale's major urban corridors. The facility meets multiple uses and objectives, and achieving this required significant collaboration and innovation from the owner, stakeholders, design team, and the contractor.

The Pump Station 71 facility's tight site layout required access for different service and emergency vehicles. Construction efforts were constricted by the small site, tenants, and adjacent homeowners. The City property also shares a common wall with five homes.

The cities of Scottsdale and Phoenix worked closely together on the project. The cities coordinated on the station's commissioning, start-up activities, and notification of operating procedures for running the new booster station. The interconnect between the two cities illustrates their willingness to work together in the best interest of the public.

GHD, which served as the prime design consultant, provided a variety of modeling, design, project, survey, and public outreach support services. MGC Contractors coordinated parking, stage of materials, installations, and subcontractor with EMT staff and homeowners.

Finished Southern Elevation. This photo was taken from the Coronado Golf Course south of the new facility. It shows how the mosaic on the front of the building wraps around its sides. The landscaping shown in the foreground is over a drainage swale and utility easement.

Honor Award
University Research

Entrant
Dr. Joel J. Ducoste
Dr. Francis L. de los Reyes, III
Dr. Tarek N. Aziz

Person in Charge
Joel J. Ducoste

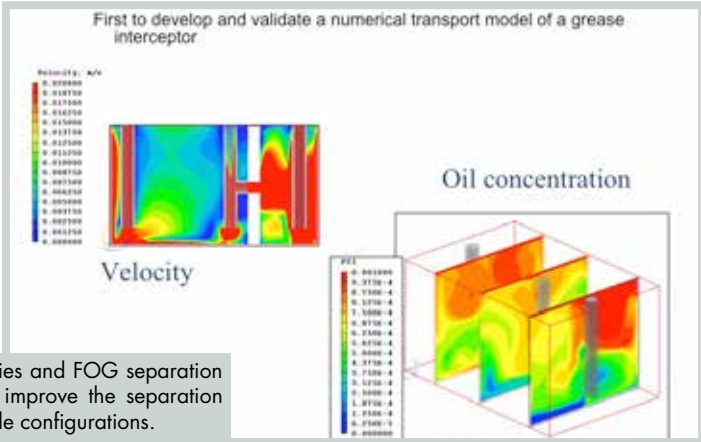
Location
Raleigh, North Carolina

Fats, Oils, and Grease (FOG) Waste; Fate and Transport in Interceptors and Sewers, Energy Recovery Through Anaerobic Co-Digestion

The US EPA estimates that fat, oil, and grease (FOG) released from food preparation and cleaning is a major cause of blockages that lead to sanitary sewer overflows. The NC State Research Team of Joel Ducoste, Francis de los Reyes, and Tarek Aziz (The Team) have worked collectively on the project and planned out the set of experiments and modeling work performed by graduate students to help understand the physical and chemical makeup of FOG deposits, the FOG transformation and removal processes, and its biological conversion into biogas using anaerobic co-digestion in municipal wastewater treatment.

Dr. Ducoste took the lead in FOG deposit characterization, CFD and design of grease interceptors, measurement of FOG using advanced methods. Dr. de los Reyes took the lead in microbial ecology of grease interceptors, impact of bioadditives, and anaerobic co-digestion bioreactor operation and microbial analysis. Dr. Aziz took the lead in techno-economic assessment of anaerobic co-digestion of FOG.

Most recently, strategies for enhancing energy production with the disposal of FOG wastes was explored. Using a novel approach of adjusting the feeding strategies of anaerobic digesters, a wastewater treatment technology capable of producing energy-rich biogas, The Team obtained nearly a 400% increase in biogas production. This approach led to the highest recorded biogas production for FOG disposal and holds great promise for full-scale operation.



This figure displays the computational fluid dynamics simulation of fluid velocities and FOG separation in a standard grease interceptor. CFD simulations like these were used to improve the separation performance by modifying the inlet and outlet geometry as well as internal baffle configurations.

2017 Environmental Communications Awards

Communicating with the public at large and other constituents can be a complex and challenging issue. Communication and marketing plans must be designed to address the objectives and strategies of the campaign to reach target audiences.

With this in mind, in cooperation with the International Water Association and the PIA Awards, AAEES offered a new area of competition for 2012, the Environmental Communications Award.

The criteria that an independent panel of judges uses to assess the entries include:

- Future value to the water engineering profession,
- Creativity and clarity in portraying and communicating the messages,
- Effectiveness in delivery and achieving desired outcome,
- Integrated Design Approach - Narrative and visual elements work together to achieve the communication objectives.

Grand Prize went to Alexandria Renew Enteprises for *Driving Community Engage with Content at AlexRenew*. The Honor Award went to *Water Replenishment District of Southern California*.

Profiles of these projects are on the following pages. Full profiles can be viewed online at http://www.aaees.org.

2017 Environmental Communication Awards Panel of Judges

- Judy Berkun
- Julia Forgas, *Senior Vice President, Marketing and Communications*, CDM Smith
- Marisa Waterman, *Marketing Specialist*, AAEES

Grand Prize

Entrant

Alexandria Renew Enterprises

Person in Charge

Lisa Van Riper

Driving Community Engagement with Content at AlexRenew

AlexRenew, a water resource recovery facility serving the City of Alexandria and parts of Fairfax County, Va. — was largely invisible in the community until recently. Its citizen board-created 2040 vision with a focus on community engagement and a rebranding were catalysts to AlexRenew throwing off its cloak of invisibility and creating a comprehensive outreach program.

Over the past two years, AlexRenew developed a comprehensive online public education program to spread awareness and help inspire water stewardship. Alexandria is an extremely diverse community, with one of the fastest growing millennial populations in the country. This, coupled with the fact that more people are relying on social media for information than ever before, drove AlexRenew to identify new communication tools and strategies to effectively reach its ratepayers and community.

AlexRenew's content plan uses a variety of communication vehicles, including social media and a newly designed AlexRenew website (www.alexrenew.com) to reach specific target audiences.

HOW THE CONTENT STRATEGY WORKS

AlexRenew largely started its online public education strategy from scratch in 2015 with a new website and social platforms. The first step was to analyze AlexRenew's audience and create target personas. AlexRenew engages each persona with different messages and platforms.

Platforms and target audiences:

- Facebook (parents and Baby Boomers)
- Twitter (parents, Millennials, and industry professionals)
- LinkedIn (industry professionals)
- Website (all audiences)

AlexRenew used a two-phased approach in developing its content strategy. The first phase focused on awareness by increasing the utility's social media following and traffic to its website. Once a following was established, the strategy shifted to include engagement.

To ensure the strategy supports AlexRenew's brand and its vision of fostering an informed local citizenry, all content is anchored around three key awareness principles. Each of these includes an awareness statement and content examples.

AlexRenew Innovation

AlexRenew is a utility of the future that values new technology to better serve its customers and the region's waterways.

- New technology
- Worker profiles
- Company news
- Community/industry engagement

Value of Water

Water is a valuable resource that we protect and preserve.

- Potomac River / Chesapeake Bay updates
- Water stories, facts and stats
- Water infrastructure

Personal Water Connection

Residents play a vital role in our efforts to protect local waterways.

- Water conservation
- Non-flushables
- Experiencing local waterways

Content is posted to Twitter and Facebook at least once a day, and to LinkedIn and Instagram multiple times per week. Longer, dynamic content for the website, such as articles about ways to enjoy local waterways, worker profiles, or videos explaining AlexRenew's work, are posted at least twice a month.

The plan also features monthly "campaigns" to further engage community members with AlexRenew's employees, the essential work the utility does for the community, and its rates that fund water cleaning infrastructure.

RESULTS

Each month, the team develops a social analytics report examining key performance metrics, along with an analysis of the best performing posts to help guide future content development.

In reviewing overall trends from the monthly reports, the team has determined that its digital content strategy to date has been a success. Both Facebook and Twitter, in particular, saw consistent and steady community growth and engagement.

Some key metrics demonstrating results are:

Facebook:

- A total of 2,450 page likes, with an average monthly growth of 150 likes
- An average of 701 monthly engagements (post likes, comments and shares)
- An average 805 clicks to the website each month

Twitter:

- A total of 2,830 followers, with an average monthly growth of 170
- An average of 145 monthly engagements (likes, retweets and mentions)
- An average of 67 clicks to the website each month

AlexRenew.com

- An average of 18,880 page views each month
- An average of 2,807 users each month
- An average of 5,589 sessions each month
- Each of the website's dynamic content sections received an average of 43 page views

In additional to these broader metrics, AlexRenew's digital content strategy proved to be effective at promoting specific campaigns. Some examples, with results, are included below.

Water transformers video

AlexRenew produced a four-minute video explaining its team members' roles as water transformers and how each person helps improve local waterways. The video was promoted on social media, and over a two-month period, it reached 10,500 individuals, and received approximately 4,000 views at $.01 per view.

Online account registration

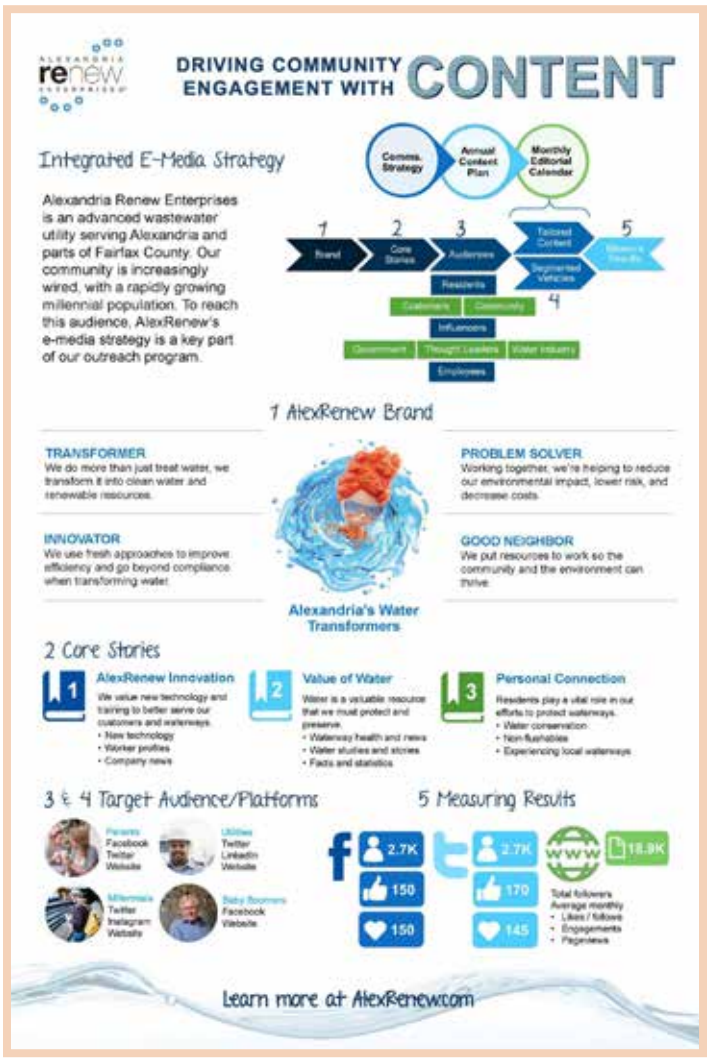
AlexRenew's new website gave customers the ability to register an online account. Social media ads were set up to direct customers to the registration page. Over a 14 month period, these ads resulted in approximately 16,500 visits to the registration page at $.13 per click.

Rate increase

When it came time to announce a proposed residential rate increase of $0.61 per month for the next two years, AlexRenew implemented a multi-faceted online messaging strategy, including a detailed Q&A about the increase on its website.

AlexRenew developed social posts about the increase and public rate hearing, along with a series of posts emphasizing the importance of investing in water infrastructure and highlighting AlexRenew's positive impact on local waterways.

AlexRenew's communication team also placed an op-ed from the organization's board chairman about the increase in the local newspaper, and promoted it on social media. The op-ed post received 46 likes, 31 clicks to the op-ed, nine shares and three comments. No negative comments were received on any of the rate increase material. All comments were positive, thanking AlexRenew for its work. Ultimately, the rate increase passed at the public hearing, held at AlexRenew's monthly board meeting.



CONCLUSION

The AlexRenew online content strategy has been a driver in the water resource recovery facility's community outreach program. Traffic to the website is significantly higher than ever before. AlexRenew's social media presence has grown from just 150 friends on Facebook to more than 2,400 fans. Our Twitter presence has grown from no presence to more than 2,800 followers. Our LinkedIn presence has grown from no presence to more than 1,000 followers. Engagement metrics demonstrate that members of the community are reading our social media posts, staying on our website, and clicking from social media to the website.

Honor Award

Entrant

Water Replenishment District of Southern California

Person in Charge

Pete Brown

Building Community Support for Water Reuse

As the largest groundwater agency in the State of California, the Water Replenishment District of Southern California (WRD) manages groundwater in two basins in Los Angeles County, California, for 43 cities and almost 4 million residents. California experienced a historic drought 2012-2016, and faces continued challenges with insufficient or unreliable water supplies. In response, WRD developed the Groundwater Reliability Improvement Project (GRIP) to purify recycled water for groundwater replenishment. While the finished product water exceeds drinking water standards, a stigma exists for public adoption of recycled water. To overcome these challenges and build support for the project, WRD recognized the opportunity to educate the community about the need for recycled water and the safety of recycled water.

WRD successfully communicated these complex and challenging issues, receiving over 1300 individual cards and 42 letters of support from cities, legislators and local residents. In addition to demonstrating support for recycled water from a sophisticated and diverse population, WRD also made an extra effort to engage with residents of economically disadvantaged communities. Since water scarcity is a growing problem in California and all over the world, WRD's innovative approach to education, inclusive outreach, and environmental justice provides future value to the water engineering profession.

BACKGROUND

Nearly 60% of the water consumed in WRD's service area is imported from the Colorado River and Northern California. To reduce costs and improve reliability, WRD began introducing advanced treated recycled water as a replenishment source for the region's groundwater. A cornerstone of this effort is WRD's Groundwater Reliability Improvement Project (GRIP). This multi-jurisdictional project includes a state-of-the-art advanced water treatment facility to produce 10,000 acre-feet per year of ultra-pure recycled water to replenish the Central Groundwater Basin, eliminating the use of water imports for this purpose.

In the early stages of the project, WRD conducted public surveys and focus groups to assess the public's understanding of groundwater, recycled water, WRD's goals, and regional water issues. Results revealed a need for education about local groundwater resources and the safety of recycled water. WRD recognized that public education would be imperative to earn community support for GRIP, and to meet its goals and objectives for groundwater management.

THE COMMUNICATION PLAN

WRD developed a Strategic Community Relations Plan for the 43-city service area, and a focused Community Relations Plan for the City of Pico Rivera, with assistance from consultants. Primary target audiences included key community leaders, organizations, local governments, businesses, media, and residents. The objective has been to build awareness, trust, confidence, support, and acceptance of GRIP.

WRD's approach involved taking outreach directly to the people, and making a special effort to engage with economically disadvantaged communities in the Pico Rivera neighborhood where the project was to occur. Since neighborhoods adjacent to the facility are 91% Hispanic, bilingual outreach was essential. WRD used an integrated approach to messaging with text, imagery, videos and face-to-face conversations. Key components and measures of success included:

Strategic outreach to economically disadvantaged and bilingual communities

WRD distributed over 375,000 newsletters, and 1100 informational door hangers in 2015-2016 and spent 600 hours on door-to-door outreach. The education program included brochures, construction updates, a toll-free information hotline, and invitations to community events. Other activities included a booth at the Pico Rivera Annual Business expo; education about GRIP at the 2014, 2015 and 2016 Groundwater Festivals; and many media opportunities. All outreach materials were translated into Spanish.

Design charrette for Pico Rivera residents

This was one of the more fun, innovative and successful approaches to community relations. Neighborhood residents were able to share their ideas for the new facility. As a result of community input, GRIP now includes significant urban greening features, a Learning Center, demonstration gardens and more.

Animated architectural renderings

WRD created architectural renderings and a three-dimensional fly-through animation to help residents visualize the GRIP site.

Digital and Social Outreach

A project website was created to help citizens understand what is planned for GRIP and why it is needed. The website features many short videos about GRIP. www.gripproject.org/videos

The educational video entitled, "What is GRIP?" presents information on groundwater, WRD's mission, and GRIP in both English and Spanish.

Community Events

WRD has hosted many educational events to answer questions as GRIP progressed from concept to design to construction. In addition to the Design Charrette, WRD hosted a "Meet Your Neighbor Event" at the GRIP Site.

Groundwater Festival and News Media Coverage:

In 2016, WRD hosted the ninth annual Groundwater Festival which included free workshops, entertainment, activities for families, and education opportunities about water. Approximately 3,000 people attended in 2016, and the event was featured on the local NBC LA news.

Cost Effectiveness

Education and outreach have brought acceptance and support for the project. The City Planning Commission unanimously supported the conditional use permit allowing for construction to start. The project was advanced without litigation. WRD has formed positive relationships with influential community members and created transparency in all aspects of the project, including costs, water quality, and safety—further advancing WRD's mission and providing extra value.

FUTURE VALUE

WRD has transformed a public works project into an education campaign that has increased public perception and support for a new local water supply and for GRIP. WRD demonstrated environmental justice by providing inclusive, bilingual outreach to economically disadvantaged communities. GRIP is a great example where the result of such outreach yields a better end product.

This is an example for other agencies in water reuse projects. By making a recycled water project of this scale mainstream, WRD has demonstrated how to grow support and acceptance from a sophisticated large population. WRD's example is already drawing interest from project proponents from across the United States. Delegations from Korea and Mongolia recently toured WRD facilities, and later in 2017, water managers from around the globe will tour GRIP as part of the 11th IWA International Conference on Water Reclamation and Reuse.

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