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FEATURES

DEPARTMENTS

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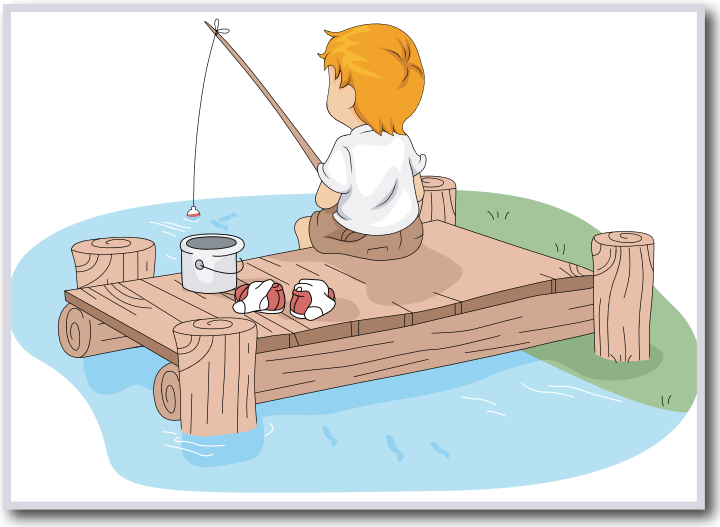
PRESIDENT'S PAGE

C. Hunter Nolen, P.E., BCEE

What Do Cane Poles, Shrimp Boats, Gold Mines, and a Vineyard Have to do With Environmental Engineering and Science?



In 1964 in South Austin, Texas, a six-year-old boy could roam free around the neighborhood and small "holdout" farms and fields that were inevitably yielding ground to the city's urban sprawl. This little son-of-city-folks loved the sweet and savory flavor of the nearby countryside and was especially drawn to a small farm pond on a beat-up old homestead. One day, he took an old cane pole and kite string from the garage, a paper clip from "mamma's" desk, stuffed a wad of bread into his pocket, and headed out to catch a fish. He sneaked past the rusty, shot-up no trespassing sign, through the barbed wire fence, and cautiously approached the pond hoping not to annoy the skinny cow and worn out old donkey trying to stay cool in the muddy water. With one eye on the bobber and the other on the dilapidated old farmhouse, he was ready to run if the grumpy farmer appeared; as legend had it, he carried a 12-gauge shotgun loaded with rock salt just for pesky neighborhood kids. Nothing this little boy had ever experienced felt more invigorating than this; and even though soggy bread falls apart, and paper clips make poor fish hooks, this was the beginning of a life most enjoyed in the great outdoors. He was destined for a career working in the natural environment, only he didn't yet know it.

That boy eventually learned how to catch fish and in order to learn how to catch more fish, he entered the Aquatic Biology program at the University of Texas, including a semester at the UT Marine Science Institute in Port Aransas. Working on a converted shrimp-boat-research-vessel and catching fish for science brought the greatest of joy and adventure to this young man. Flying fish gliding above the sea surface, porpoises dancing on the bow wave, and phosphorescent creatures lighting up the depths secured his focus toward the magic of nature; and somewhere along the way, he developed a willingness to study.

Why, then, would this Texas boy want to go to Montana, a place he had never been? The fly fishing, of course! And, by coincidence, Montana State University had an Environmental Engineering graduate program. He learned about water chemistry, water treatment, wastewater treatment, fluid dynamics, solid waste management, and the many other fundamentals of environmental engineering. And who in Montana needs people with these kinds of skills? Well, aside from the usual suspects of public municipalities, regulatory agencies, and general industries, gold mines do! Gold miners must be backwards, greedy, mean-spirited, anything-for-money abusers of the environment, right? Wrong! Our fish-crazed environmental engineer learned a great deal about the heart and soul of these fine people who only wanted to make a living by bringing natural resources out of the ground and to the marketplace, but not at the expense of environmental abuse. In fact, he never met a miner who wanted to destroy the environment, but he did meet plenty who were frustrated and insulted by eco-fanatics who wanted simply to stop any and all mining in the State of Montana. Why wouldn't these activists be reasonable, he wondered? Why couldn't they work with the miners toward ensuring environmental solutions rather than trying to shut them down? He didn't like that all-or-nothing approach to environmental protection. So he focused on doing what he

> Our fish-crazed environmental engineer learned a great deal about the heart and soul of these fine people who only wanted to make a living by bringing natural resources out of the ground and to the marketplace, but not at the expense of environmental abuse.

could to help. He learned about the many measures applied in mining to control environmental impact, and he helped to assure a proper balance between resource development and environmental protection. He viewed this as his ultimate duty, to bring solutions for the human population's impacts on the natural environment.

One day, the young man blinked and he wasn't young anymore. Thirty years had passed and he looked like an old buck in the woods - sway backed and thick around the middle. But, he had learned a few things along the way about environmental engineering and science. Thousands of successes, thousands of lessons learned, enough hard knocks to put the ego in its right, tempered state. He took those experiences and built a vineyard. *A vineyard*? He liked wine for one thing, but he also had learned over the years how to plan and execute complex projects in sync with nature. He learned how to visualize an end product, how to define the pieces of a puzzle to accomplish a goal - that it is not a question of *if* something will go wrong along the way, but how to take it in stride and solve it when it does. Environmental engineering had been very good to this

man. It had greatly influenced the man he had become - satisfied, appreciative, and blessed with the experiences of a lifetime in this most excellent profession. And to top it off, he was Board Certified with the AAEES, a badge of honor par-none in the field of environmental engineering and science.

Ask any AAEES member and they will have their own story how they came to be advanced practitioners in environmental engineering and science. Consider the winners of this year's AAEES awards *(starting on page 27)*. Besides the high honor of earning these most prestigious awards, what is their story? Did it start with a cane pole and a muddy farm pond, or something else?

What is *your* story? If you are near the end of it, it's a safe bet you are rich with grand experiences. If you're just getting started, enjoy the ride.

Barna Tanko/Shutterstock.com

Small roadside wine vineyard in the Texas Hill Country.
Terri Butler Photography/Shutterstock.com

EXECUTIVE DIRECTOR'S PAGE

Burk Kalweit

How Americans View Environmental Issues

The 1970s were an important era for American environmentalism. Congress passed the Clean Water Act and the Endangered Species Act, President Richard Nixon established the Environmental Protection Agency, and the nation observed its first Earth Day - created by Wisconsin Sen. Gaylord Nelson - on April 22, 1970.

Now, nearly a half century later, Earth Day has expanded across the globe as over 170 countries hold events ranging from river clean-ups to rallies, all having a distinctly local flavor as the organizers worked to make the case that Earth Day starts locally and extends to a global sphere of issues and concerns that require different kinds of activities in different locales.

So it seemed like a good idea to take a look at some of the survey work being done in the environmental sector to see how things are changing, and whether these changes are for the better or detrimental. So we pulled up the latest edition of the Pew Charitable Trust's ongoing series of public opinion surveys on environmental topics for some cranial fodder.

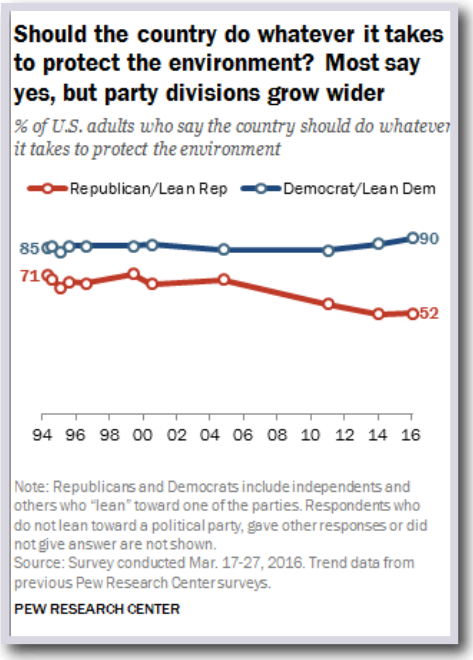
The results that we cite below come from work done primarily in 2016 and 2017. Pew has reported extensively on environmental issues, but we only selected a small sample of the related results for use as our source data. And that leaves us with only six findings about the public's views of the environment to report on. For those wishing to get a broader, more comprehensive perspective, we suggest that you check out pewresearch.org to get introduced to their latest work, or to explore the history of the environmental movement as it was captured by the ongoing series of surveys. With that advice out of the way, let's turn to our six point summary of 50 years of environmentalism.

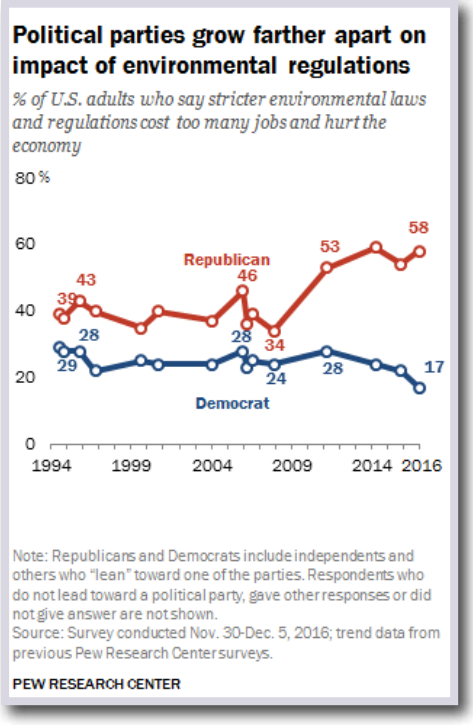
1. Americans support protecting the environment, but there are deep partisan divides on the issue.

Democrats and Democratic-leaning independents have consistently been more likely than Republicans and Republican leaners to say the country should do whatever it takes to protect the environment. But as Republican support has decreased since 2004, the gap between the two groups has widened to 38 percentage points.

2. Views about environmental regulations are more partisan today than they were a decade ago.

Roughly six-in-ten Republicans and Republican leaners (58%) said in another survey that environmental laws and regulations cost too many jobs and hurt





> "Now more than ever, the nation needs the experience and talent embodied by the Academy to help us find the middle ground that enables the simultaneous achievement of environmental and economic objectives.

the economy, up from 34% in 2007. By comparison, a declining share of Democrats and Democratic leaners hold this view. This partisan gap now stands at 41 percentage points; in 2007, it was 10 points. That is an astonishing shift in so short a period of time.

3. Many Americans view protecting the environment as a top priority, but more respondents cited other issues – like terrorism or the economy – as a top priority.

More than half (55%) of Americans ranked the environment as a top policy issue that President Donald Trump and Congress should tackle this year, according to a January 2018 Pew survey. But defending the country from future terrorist attacks (76%) and strengthening the economy (73%) were at the top of the public's priority list.

4. Three-quarters of Americans are concerned about the environment, but fewer say they make an effort to live out that concern all the time.

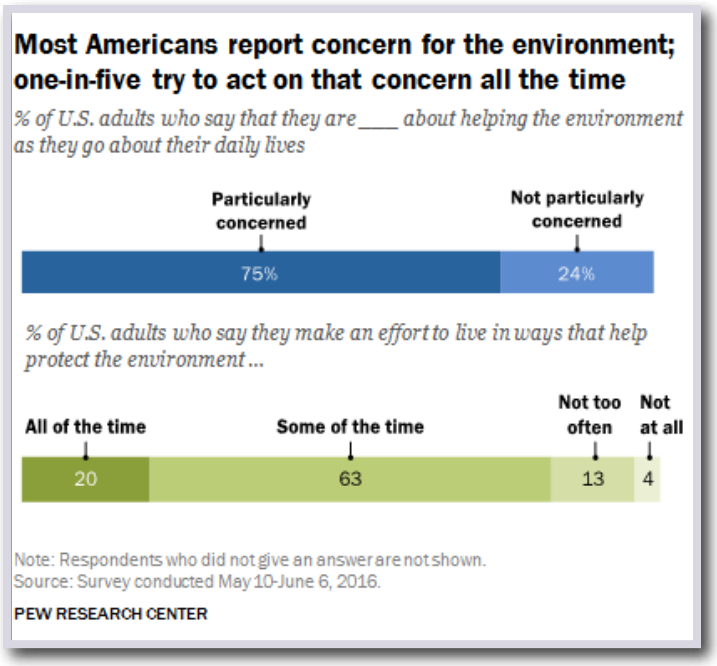
Not a large surprise here. The research shows that US adults have their hearts in the right place, but only one-in-five Americans say they make an effort to live in ways that help protect the environment "all the time." Curiously, individuals age 65 and older are three times as likely as those ages 18 to 29 to say they make this effort all the time (36% vs. 12%).

5. Overall, 32% of U.S. adults say they are bothered a lot by people throwing away things that could be recycled.

Roughly 60% of Americans who say they always try to live in ways that protect the environment find that it bothers them "a lot" when others throw away things that could be recycled. People who are environmentally conscious are also twice as likely as others to say that seeing someone incorrectly putting trash in recycling bins bothers them a lot (42% vs. 21%). If we need some positive indicators, Pew Research Center data show that a majority of Americans do recycle. Close to half of U.S. adults (46%) said they recycle or reduce waste to protect the environment "whenever possible." Just 4% of the public said they "never" recycle or reduce waste to protect the environment.

6. What actually gets recycled varies by product type.

In addition to its original survey research work, Pew also performed an analysis of EPA data on recycling. The analysis



revealed that there are some interesting trends afoot. Breaking out by product type, the research found that 99% of lead-acid batteries (the sort found in cars) were recycled. Similarly, 88.5% of corrugated cardboard boxes and 67% of newspapers and directories were recycled in 2013. By comparison, just 13.5% of plastic bags and wraps and 6.2% of small appliances were recycled that year.

So what can we take away from this minimalist state of Earth Day report? It looks like things are on an even keel with respect to the slow progress being made in changing people's opinions of environmental issues. Awareness is critical and appears to be improving. However, in some cases awareness hasn't done that much for prioritization of environmental objectives. The continued expansion of the gap between those who think environmental regulation is necessary and beneficial, and those who think environmental regulation is stifling the economy is a concern.

The bottom line appears to be that, as usual, there are no easy answers. The implications for the Academy and its members are self-evident. Now more than ever, the nation needs the experience and talent embodied by the Academy to help us find the middle ground that enables the simultaneous achievement of environmental and economic objectives.

OK - but how do we ... ? Well, never mind. As noted in other editions of this publication, nobody said it was going to be easy.

Editor's Note: Used with permission by the Pew Research Center (http://www.pewresearch.org)
Story Source: Monica Anderson/For Earth Day, here's how Americans view environmental issues (http://www.pewresearch.org/fact-tank/2017/04/20/for-earth-day-heres-how-americans-view-environmental-issues)

Officer Nominees for 2019

The Academy's Nominating Committee is chaired by Past President Howard B. LaFever. Its members include Lilia A. Abron, Christian Davies-Venn, Merlyn L. Hough, Richard J. Pope, and James F. Stahl. The following candidates have been recommended for 2019.

PRESIDENT-ELECT

James W. Patterson, Ph.D., BCEEM

VICE PRESIDENT CANDIDATES

Lilia Abron, Ph.D., P.E., BCEE
Daniel B. Oerther, Ph.D, P.E., BCEE

TRUSTEE-AT-LARGE CANDIDATES

James Clarke, Ph.D., BCES
David M. Gaddis, P.E., BCEE
Robert H. Gilbertsen, P.E., BCEE
Richard P. Watson, P.E., BCEE

PRESIDENT-ELECT

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.

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, their 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.

Daniel B. Oerther, Ph.D., P.E., BCEE, D.AAS, CEP, C.Eng, M.CIEH, C.Env, is a Professor of Environmental Health Engineering at the Missouri University of Science and Technology in Rolla. His service to AAEES includes: Audit, Finance, Membership, and Strategic Planning committees; member of the Board of Trustees; and since 2013, Treasurer of the Academy. Dan founded and funded the Academy's Student Team Award. He has received numerous awards from AAEES, including: the 2009 Excellence in Environmental Engineering and Science (E3S) University Research Honor Award for, "Improved Water Quality in Northwest Tanzania"; 2014 Excellence in Environmental Engineering and Science Education Award; 2016 E3S Superior Achievement Award for, "Improved Water Quality in Ixcan, Guatemala" (only the second time in E3S history that a University Research Project has won the overall Superior Achievement Award), the 2017 Pohland Medal for, "bridging research, education, and practice," and the 2018 Kappe Award for, "advancing public awareness to the betterment of the environment and the objectives of the Academy."

Professor Oerther earned his doctorate from the University of Illinois, and he was previously Department Chair at the University of Cincinnati. Dan uses environmental biotechnology to achieve sustainable development at the nexus of water quality and food security. He co-founded/directed: NSF GK-12 Project STEP at Cincinnati; Ohio Center for Excellence in Sustaining the Urban Environment; Environmental Research Center at Missouri; and Missouri Center for Science Diplomacy Laboratory. He served as major advisor for 14 doctoral and 22 masters students, and he co-authored more than 150 peer-reviewed publications. Dan's leadership experience includes: Associate Editor, ASCE *Journal of Environmental Engineering*; Chair, WEFTEC Research Symposium; Associate Editor, *Water Environment Research*; Board of Directors, AEESP; Program Evaluator, ABET; Mayor's Steering Committee for the Green Cincinnati Plan; Phelps County (Missouri) Extension Council; and Environment, Science, Technology, and Health (ESTH) Advisor to the United States Secretary of State.

Professor Oerther is a licensed Professional Engineer in three states, a Diplomate of the American Academy of Sanitarians (D.AAS), and he is Certified by the Academy of Board Certified Environmental Professional (CEP). He regularly consults for industry (ARCADIS, CH2M, and others) and government (United Nations, World Bank, and others). Dan is a Jefferson Science Fellow of the U.S. National Academies, a Lifetime Honorary Fellow of the American Academy of Nursing (F.AAN), and both a Fellow of the Royal Society for Public Health (F.RSPH) and a Fellow of the Royal Society for Arts (F.RSA) in the United Kingdom where he is also registered as a Chartered Engineer (C.Eng, equivalent to BCEE), a Member of the Chartered Institute of Environmental Health (M.CIEH, equivalent to D.AAS), and as a Chartered Environmentalist (C.Env, equivalent to BCES).

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 is an AAEES Board Certified Environmental Scientist and a Fellow of the American Academy of Forensic Sciences.

Jim is a member of the AAEES Certification through Eminence committee, the American Academy of Environmental Scientists Certification Board and chairs an AAEES Task Force charged with identifying ways to improve the integration of Board Certified Environmental Scientists into Academy functions and operations.

His research interests are in the areas of environmental sustainability and resilience, environmental risk analysis and performance assessment, the investigation, remediation and long-term management of contaminated sites, nuclear environmental engineering and the environmental consequences of energy choices. At Vanderbilt, he teaches courses in Environmental Assessment, Environmental Characterization and Analysis and a first year undergraduate seminar in Energy Choices and Environmental Consequences. Professor Clarke has over 250 publications and presentations.

Jim has over 40 years of environmental management and consulting experience, including serving as Chairman, President and CEO of ECKENFELDER INC. and currently as a Technical Director and member of the Board of Directors of AquAeTer, Inc. Also, Jim was a member of the Nuclear Regulatory Commission (NRC) former Advisory Committee on Nuclear Waste and Materials and served as its lead member for decommissioning and risk-informed regulation. He has also served on the National Academy of Science/National Research Council Committees on Remediation of Buried and Tank Waste and Tritium Releases from Nuclear Power Plants and is a peer reviewer for the U.S. Environmental Protection Agency, the Department of Energy, the Nuclear Regulatory Commission, the National Academies, and several journals and book publishers.

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).

David M. Gaddis, P.E., BCEE, is a Corporate Quality Manager at CDM Smith Inc., an employee-owned full service engineering and construction firm founded in 1947. The Firm's focus is on providing solutions in water, environment, transportation, energy and facilities fields. Mr. Gaddis has spent his entire 34-year career with CDM Smith.

David Gaddis works with a core team to monitor the implementation and function of the Firm's ISO 9001:2008-compliant Quality Management System (QMS) and spearheads firm-wide quality initiatives. David ensures QMS process execution and client requirement awareness throughout the organization. This is accomplished through a multi-faceted auditing program, coordination with a nationwide team of quality managers and various data gathering and metric reporting mechanisms. David is also a key member of the core team that drives the firm's QMS and global business best practice improvements.

Mr. Gaddis is a practicing environmental engineer whose experience includes study, design, construction coordination, resident engineering, and start-up of facilities across the spectrum of CDM Smith's practice. He is licensed to practice engineering in 4 states. Among his accomplishments, Mr. Gaddis was a member of the firm's project management training committee.

Mr. Gaddis received his DEE certification in 2001 and became an active member of the AAEES Excellence in Environmental Engineering and Science Committee in 2009. He accepted the Chair position in 2012. He has been the New Jersey State Representative for AAEES since 2009.

Under his direction, several projects have received peer recognition, including The Somerset Hills Interceptor Rehabilitation, Somerset, NJ (CEC of New Jersey Grand Award 1999); Franklin Township Sewerage Authority Sewer Map Automation Project (CEC Honor Award 1999); Montclair Radium Contamination Cleanup, Montclair, New Jersey (CEC of New Jersey Excellence Award 1992); NJDEP, Camden Metropolitan Area Water Supply Feasibility Study, New Jersey (National ACEC Honor Award).

Mr. Gaddis is an FAA-licensed airplane pilot, holds a commercial deep sea diver certificate, and serves his community as a trustee of the 1,000-member homeowner association where he lives. He has a daughter, Sarah who is enjoying college at Loyola University Chicago.

Robert H. Gilbertsen, P.E., BCEE, CPEA, is a Senior Managing Consultant at Ramboll. Mr. Gilbertsen has more than 30 years of experience in environmental consulting. Mr. Gilbertsen's current practice includes the design and implementation of environmental, health, and safety (EHS) management systems, EHS compliance auditing and implementation of corrective actions. He also consults on oil management and spill prevention. He has consulted for chemical and pharmaceutical plants, airlines and cruise lines, general manufacturing, aerospace manufacturing,

petroleum facilities, food and beverage manufacturers, power plants, compressed-gas vendors, steel mills and breweries. Mr. Gilbertsen has been a consultant throughout his career, starting in storm water and potable water at Harza Environmental Services. Later he practiced in investigation and remediation of Superfund and brownfield sites at WESTON. More recently, he has practiced in EHS management consulting and auditing at ENSR/AECOM and now Ramboll Environ.

As Trustee, Mr. Gilbertsen would work to spread the understanding of the value of board certification, both as an objective standard of technical competency and as an incentive for pursuing personal technical development throughout an environmental professional's career.

Mr. Gilbertsen currently serves as the Chairman of the Academy's Development and Upgrading of Examinations Committee (DUEC) and formerly chaired the Academy's Hazardous Waste Management Committee. He also currently serves as Co-chair of the Institute of Internal Auditors' Chicago Chapter's EHS Audit Center, where're he organizes twice-yearly technical seminars. He previously served as Director of ASCE's Illinois Section and Chairman of the Illinois Section's Environmental Engineering and Water Resources Committee.

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 Board member of the Northeast Recycling Council he has served as Vice President, President and currently is Treasurer. 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 two years as Chair and is currently serving his first year on the Board as a Trustee-at-Large.

Ballots will be mailed in late April.
To be valid, ballots must be signed and received on or before June 15, 2018.

Your Vote Counts!

MEMBER NEWS

ON THE MOVE

David Zimmer, P.E., BCEE, is the new North America Unit President at CDM Smith. His previous position was as Senior Vice President (Charlotte, NC). David Zimmer has been a Board Certified Environmental Engineer in Water Supply and Wastewater Engineering since 1996.

AWARDS AND RECOGNITION

Dr. Bruce Rittmann, NAE, DMASCE, FAAAS, FIWA, BCEE, is the 2018 Stockholm Water Prize recipient. The Stockholm Water Prize is an international water award presented annually since 1991 by the Stockholm Water Foundation. The prize has been established to honour outstanding achievements in the sustainable use and protection of the world's water resources. Dr. Rittmann, of Arizona State University, is Distinguished Sustainability Scientist of the Julie Ann Wrigley Global Institute of Sustainability, Regents' Professor, School of Sustainable Engineering and the Built Environment of Ira A. Fulton Schools of Engineering, and Director of Swette Center for Environmental Biotechnology, Biodesign Institute. He is an AAEES Honorary Member.

IN MEMORIAM

Clement B. Potelunas, Jr., P.E., BCEE

Clement B. Potelunas Jr., 70, of Idaho Falls, Idaho, passed away on Jan. 7, 2017, at his home.

Born in New York, N.Y., to Dr. Clement and Grace Potelunas Sr., he was the eldest of six. He spent his childhood in Wilkes-Barre and Scranton. He received a bachelor's degree in environmental engineering from Penn State and a Master of Science degree from University of Idaho.

In 1972, he married Marie Trunzo and they moved to Toledo, Ohio, where he began his career as the environmental engineer for Jeep Corp. In 1992, they moved to Idaho Falls, where he worked for Idaho Department of Environmental Quality, Idaho National Laboratory and Portage Environmental. Starting in 2005, he worked as a Consultant for FEMA.

Clem was a man of many interests. He loved photography, painting, wood carving, ham radio, archery, but nowhere was this more evident than his love of shooting sports. Through his varied interests and hobbies, he touched and enriched the lives of so many people. He never failed to take a moment to share his knowledge. People were drawn to Clem, awed by his intelligence and intrigued by his journeys through life and walked away forever changed by his unparalleled love for making lifelong friends with everyone he met.

His memberships include Knights of Columbus Council 1663 and George J. Keller Assembly 187, where he was a Past Grand Knight and Past Faithful Navigator; Fort Industry Masonic Lodge and Shrine in Toledo, Ohio, as a member of the Highlander Bagpipe Band; Eagle Rock Lodge 19 in Idaho Falls, Idaho.

Surviving are his wife, Marie; children, Daria, Boise, Idaho; Peter, Tempe, Ariz.; Anna, Phoenix, Ariz.; sisters, Maryanna Carp, Harrisburg, Pa.; Dr. Margaret Campbell, Dunmore, Pa.; Grace Byrne, Scranton, Pa.; brothers, James, Moscow, Pa.; Joseph, Mountaintop, Pa.; nieces and nephews.

Mr. Potelunas was a Life member and had been a Board Certified Environmental Engineer in General Environmental Engineering since 1991.

Published in *Scranton Times* on January 11, 2017.

2018 Excellence in Environmental Engineering & Science™ Awards Competition

Now in it's 29th year, the annual Excellence in Environmental Engineering and Science (E3S) recognizes and promotes quality and innovative projects in environmental engineering and environmental science. Projects are judged in the following categories:

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

Each entry is judged based on the following criteria:

- Demonstration of a comprehensive, integrated approach that considers all environmental media, i.e., air, water, and land.
- Quality as evidenced by the degree of user satisfaction and proven performance.
- Originality and innovation, representing the application of new knowledge, a new application of existing knowledge, or an innovative mix of existing knowledge.
- The complexity of the problem or situation addressed.
- 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 Los Angeles Department of Water and Power won three prizes for 2018. They won the top prize, the Superior Achievement in Environmental Engineering and Science, for *LA's Water Conservation Potential Study Targets a Sustainable Future*, a project originally entered in Environmental Sustainability. They also won the Grand Prize in both Environmental Sustainability and Operations/Management for *Los Angeles Aqueduct - Owens Lake Environmental Protection and Dust Mitigation*.

Last year's Superior Achievement award winner, Savron, a division of Geosyntec Consultants International, Inc., won this year's Grand Prize in Industrial Waste Practice for their project, *From Pilot to Full Scale: Development of Starx HottPad™*. The Grand Prize winner in this category also receives the W. Wesley Eckenfelder Industrial Waste Management Medal, sponsored by AquAeTer. The medal was established in 2012 in honor of the late W. Wesley Eckenfelder, Jr., Sc.D., P.E., BCEE (1926 - 2010), a pioneer in the field of wastewater treatment and an authority in industrial wastewater management.

Full profiles of the winning projects can be found online at http://www.aaees.org/e3scompetition/.

THANK YOU TO OUR 2018 E3S PANEL OF JUDGES

- **Tim Berry**
- **Jack Bryck**
- **Majid Chaudhry**
- **Mary Clyburn**
- **Rui DeCarvalho**
- **Douglas Eckmann**
- **Vinio Floris**
- **Jerome Gilbert**
- **Georgine Grissop**
- **Robert Hurdle**
- **Joseph Lauria**
- **James Law**
- **Nancy Manley**
- **Jose Marti**
- **Kevin Morris**
- **Thomas Sprehe**
- **Ram Tewari**
- **Greg Welter**
- **David Wunder**

SUPERIOR ACHIEVEMENT in Environmental Engineering and Science

Entrant
Los Angeles Department of Water and Power

Engineer in Charge
David Pettijohn, P.E., BCEE

LA's Water Conservation Potential Study Targets a Sustainable Future

Los Angeles, California

The Los Angeles Department of Water and Power (LADWP) has long embraced water conservation as a key component of its water sustainability strategies. Since the formation of its Water Conservation Program in 1977, more than 42 billion gallons per year in water savings has been achieved from LADWP's rebate programs. As a result of these investments, the City's per capita water use has remained flat for the last 40 years despite an increase of more than one million residents.

To continue aggressively pursuing additional water conservation, LADWP initiated and coordinated the development of the Water Conservation Potential Study (WCPS) in 2014. The WCPS identified more than $350 million cost-effective investment opportunities and 45 billion additional gallons of water per year in conservation potential (enough water to serve 420,000 homes in the City on an annual basis). The extraordinary volume of conservation identified by the WCPS will help ensure the sustainability of LA's future water supply.

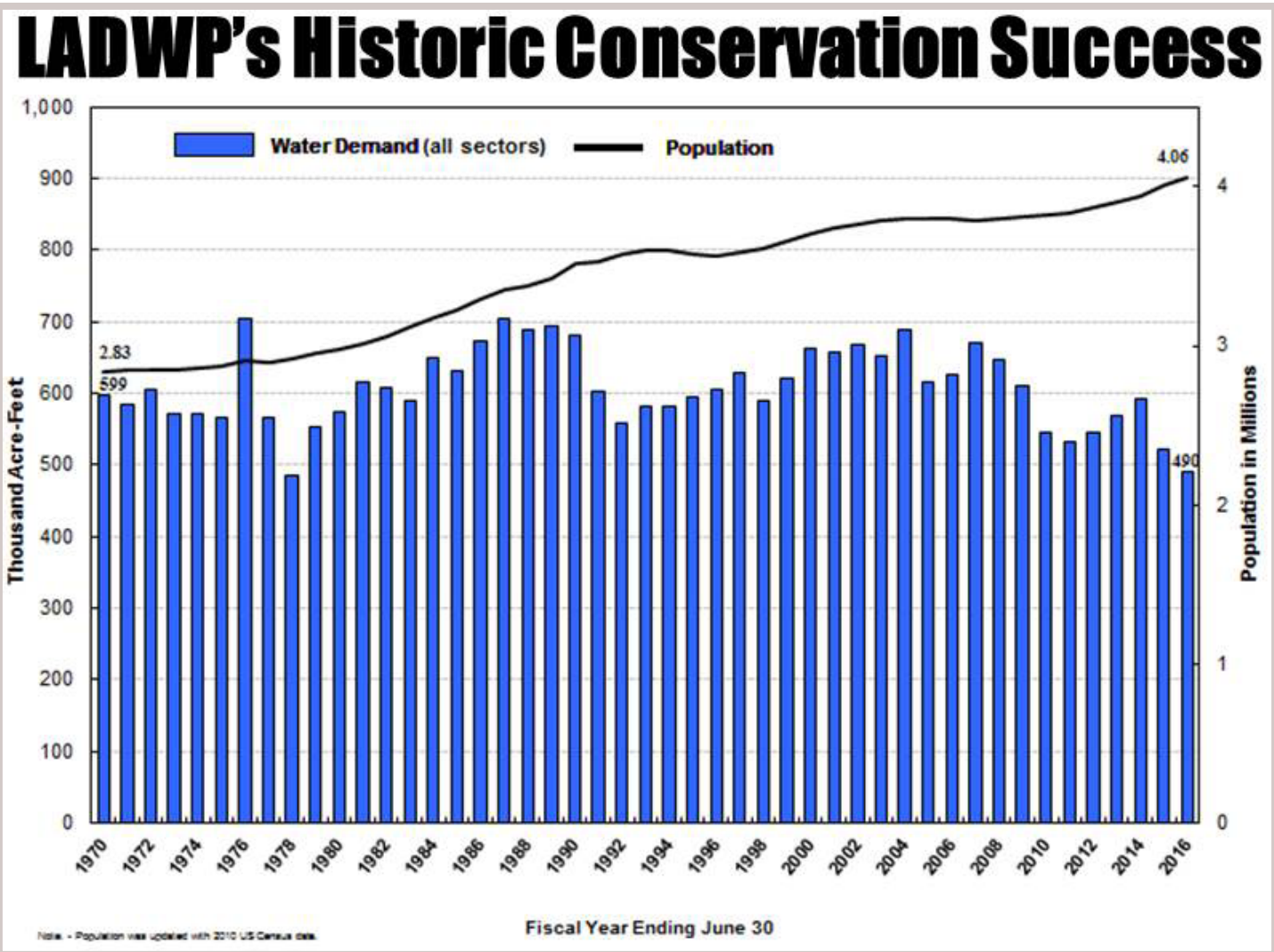
The implementation of water efficiency measures will result in substantial reductions in greenhouse gas emissions and cost savings for customers in both water and energy. The WCPS is fundamental for LADWP's long-term strategic plan to reduce per capita water consumption by an additional 25 percent by 2035.

Highlights of the study include:

- 615 single-family surveys
- 72 single-family home audits
- 4,025 multi-family online surveys
- 100 onsite audits of City facilities
- Extensive research with satellite imagery, GIS mapping, billing and rebate databases, literature review, and interviews with industry experts
- Use of prior audits for all schools in the Los Angeles Unified School District
- A robust, "living" computer forecasting model that can update with emerging technology and innovations

The WCPS cost $1,000,000 and took three years to complete. Significant investments were dedicated to ensure accurate study findings for LADWP's service area. The study is the first of its kind at the national level by conducting the research and analysis necessary to answer questions needed for effective long-term planning. The Water Conservation Potential Study can be downloaded on LADWP's water conservation website (www.ladwp.com/wc).

left A variety of data collection methods were used to improve the accuracy of study findings (satellite imagery, on-site audits, billing and rebate databases, phone surveys, literature review, and interviews with industry experts).



Comprehensive Study Methodology

(1) Research & Data Collection

- Literature review
- Single-family telephone survey
- Single-family onsite home audits
- Multifamily online survey
- Interviews with CII Audit Experts
- City-owned facilities audits

(2) Saturation Levels & Baseline Water Use Tables

- 4 main water sectors
- Over 15 water end uses
- Baseline efficiency saturation levels
- Water end use calibration

(3) Water Conservation Model

- Passive Program Conservation Potential
- Max Cost-Effective Conservation Potential
- Technical Max Conservation Potential
- Conservation and economic projections up to 2035

Full Inventory of Existing Water Uses

Single-Family and Multifamily

Indoor Water End Uses	Outdoor Water End Uses
Toilet	Landscape Irrigation
Shower/Bath	Swimming Pool
Faucets	Hot Tub/Spa
Dishwasher	Vehicle Washing
Washing Machine	
Water Quality System	
Central Laundry Facility (Multifamily)	

CII and City-Owned Facilities

Indoor Water End Uses	Outdoor Water End Uses
Toilet	Landscape Irrigation
Urinal	Swimming Pool
Shower/Bath	Hot Tub/Spa
Faucet	Vehicle Washing
Dishwasher	Decorative Water Features
Washing Machine	
Water Quality System	
Pre-rinse Spray Valves	
Food Prep & Service	
Ice Machine	
Process Water Use	
Cooling Tower	

top LADWP's historic conservation investments have helped keep the City's water use flat for the last 40 years despite an increase of over one million residents.

above left LADWP completed its robust Water Conservation Potential Study to help meet long-term goals.

above right The Water Conservation Potential Study comprehensively analyzed all major water end uses for each of LADWP's customer sectors.

GRAND PRIZE Design

Entrant

Metro Wastewater Reclamation District

Engineer in Charge

Steve Patterson, P.E.

Northern Treatment Plant Facilities

Brighton, Colorado

As a result of 35 years of wastewater planning for the northeastern Denver metropolitan area the Metro Wastewater Reclamation District's (Metro District) $475M Northern Treatment Plant (NTP) Program and its $280M NTP Facilities Project (the Project) embody the spirit of regional, intergovernmental, and regulatory cooperation. This project is the largest "greenfield" water or wastewater treatment facility in the United States to be constructed using progressive design-build (PDB) delivery and the State of Colorado's first. Furthermore, the construction of the advanced wastewater treatment facility and the 78-inch pipeline to convey flows to the facility was the most environmentally responsible and cost-effective solution to allow Metro District to continue providing service to 1.8 million people.

CH2M (now CH2M/Jacobs) was selected as the Design-Builder in 2011 based on qualifications to provide design, permitting, construction, and start-up services. The project consisted of:

- 24-mgd advanced wastewater treatment facility (expandable to 60-mgd)
- 7-mile, 78-inch diameter South Platte Interceptor to convey wastewater to the new facility
- Administration Building with Visitors' Center
- 12-acres of natural effluent channel, wetlands, and community trails
- Facilities Support Building with operations center, offices, lab, facility/vehicle maintenance, and warehouse.

Carollo Engineers, Inc. and Jacobs Engineering served as Owner's Advisor while working closely with CH2M and its subcontractor, Garney Construction, throughout the completion of design, construction, and commissioning of the NTP. The project represents a unique opportunity to provide leadership in addressing wastewater treatment and permitting challenges through a facility design that makes use of the latest, proven wastewater treatment technologies and due to the collaboration of all team members was delivered on schedule and under budget. The project is designed to accommodate potential changes to these requirements in the future, as well as to have the ability to expand treatment capacity overall. The project will play a critical role in the region's water management and preservation of downstream water quality.

right The Administration Building includes a Visitor's Center with interactive educational displays. The displays are designed to provide information on the water cycle and how the Metro District helps protect the South Platte River.

bottom Investments in odor control and treatment facilities demonstrate the District's "good neighbor" commitment.

GRAND PRIZE Environmental Sustainability AND Operations/Management

Entrant
Los Angeles Department of Water and Power

Engineer in Charge
James G. Yannotta, P.E.

Los Angeles Aqueduct - Owens Lake Environmental Protection and Dust Mitigation

Los Angeles, California

The Los Angeles Department of Water and Power (LADWP) has successfully mitigated 99 percent of the dust from the 48.6 square-mile area of the exposed bed of Owens Lake through its Owens Lake Program (Program), effectively making it the largest dust mitigation effort in the United States. The Program was created to address the environmental challenges of the historic Los Angeles Aqueduct System while also serving to protect the Owens Lake ecosystem.

Since 2000, LADWP has invested more than $2 billion in the Program to meet multiple goals, including improving air quality and reducing public health risk by mitigating particulate emissions of 10 microns in diameter (PM_{10} or "dust") from the exposed bed of Owens Lake; protecting and maintaining habitat; protecting environmental resources; promoting economic development and public trust values; and reducing water use through efficient dust mitigation measures.

The Program has included the planning, design, and construction of dust mitigation measures and other improvements, as well as on-going operation and maintenance. LADWP met the regulatory deadline of December 31, 2017 for Phase 10 of the Program, in full compliance with dust mitigation requirements.

Some key accomplishments of the Program are.

- Habitat Suitability Model
- Signing of the 2014 Historic Agreement
- Completion of the Owens Lake Trail

For more than 100 years, LADWP, the largest municipal water and power utility in the nation, has provided the city with reliable water and power service in a cost-effective and environmentally responsible manner. LADWP serves water and electricity to nearly 4 million residents of the City of Los Angeles, its businesses and visitors.

top Dust storm on Owens Lake before dust mitigation implemented
bottom left Construction of dust mitigation and habitat features
bottom right After construction of dust mitigation and habitat features

GRAND PRIZE Industrial Waste Practice

Entrant
Savron,
a division of Geosyntec Consultants International, Inc.

Engineer in Charge
David Major, Ph.D., BCES

From Pilot to Full Scale: Development of STARx HottPad™

Houston, Texas

Self-sustaining treatment for active remediation (STAR) is based on a patented technology – an energy-efficient self-sustaining combustion process that captures and recycles the energy released from hazardous materials to destroy them in an effective, controllable, and safe manner. A broad range of hazardous materials including petroleum hydrocarbons, coal tar, creosote, and mineral oils can be treated by this technology. It works faster and to a dramatically higher environmental standard than common hazardous waste disposal practices such as thermal desorption, incineration, solidification, or landfilling.

Chevron and Savron teamed up and shared intellectual property over several years to develop above ground treatment systems to treat oil-impacted soils (OIS) and sludge using the same principals of Savron's STAR technology. The technology successfully evolved from the initial tests in "reactors" to test soil/sludge handling, temperature impacts on reactor walls, selection of reactor materials, operation limits and emission profiles. Through this focused research program, the STARx/HottPad™ system was developed.

This is a low profile constructed base, consisting of modular units, that is used to deliver air and heat to the base of piles of OIS or sludge mixed with a porous material like sand. STARx/HottPad went from proof of concept testing to full-scale field demonstration in less than 18 months.

The full scale STARx/HottPad™ system was designed and fabricated in North America, and then shipped, installed and operated at an terminal facility in South East Asia. Through further field testing the STARx/HottPad™ system was deemed by all measures to be cost-effective, practical and deployable.

The first full-scale application of Savron's STARx HottPad™ technology was successfully implemented at an operating oil and gas terminal facility in South East Asia to treat sludge from oil-water separator ponds.

As a result, this technology is being designed for several of Chevron's facilities across the globe.

right An outcome of the project was the development of a mobile pilot test STARx/HottPad™ for use at client sites. This version can hold 16 tons of soil.

bottom right A clear difference can be seen between untreated (left) and treated (OIS) (right).

bottom right The HottPads were shipped inside shipping containers that also serve as the office and control room (heaters, blower, compressor control).

GRAND PRIZE Planning

Entrants
City of Los Angeles, LA Sanitation
Los Angeles Department of Water and Power

Engineer in Charge
Adel Hagekhalil, P.E., BCEE

One Water LA 2040 Plan

Los Angeles, California

The City of Los Angeles is nearing completion of the One Water LA 2040 Plan which takes a holistic and collaborative approach, considering all the City's water resources from surface water, groundwater, potable water, wastewater, recycled water, dry-weather runoff, and stormwater as "One Water." The Plan identifies multi-departmental and multi-agency integration opportunities to manage water in a more efficient, cost effective, and sustainable manner.

The level of complexity, scope, and large number of stakeholders involved makes One Water LA more comprehensive than most other studies or master plans. The Plan was developed in two phases:

- Phase 1: defined the Vision, Objectives, and Guiding Principles of One Water LA. More than 350 stakeholders were actively engaged in Phase 1 and continued their involvement in Phase 2. A Guiding Principles Report was completed as part of this Phase.
- Phase 2: involved a detailed, integrated planning and policy analysis resulting in an implementation strategy to meet the One Water LA vision, objectives, and guiding principles. This phase includes wastewater and stormwater facility plans, as well as recommended policies to increase coordination, integration, and management of water between all City departments.

The Planning effort was led by dedicated representatives from both LA Sanitation (LASAN) and the Los Angeles Department of Water and Power (LADWP) and shaped by input from other City departments, regional agencies, and local stakeholders. The Plan will help guide strategic decisions for integrated water projects, programs, and policies throughout the City.

right One Water LA Steering Committee - Representatives from 14 City Departments and 6 Regional Entities attended over 10 One Water LA Steering Committee Meetings. One Water LA also held over 50 one-on-one focus meetings with Departments and Agencies.

bottom left One Water LA Benefits

bottom right The One Water LA 2040 Plan consists of many plan elements and deliverables that will form the foundation of the One Water LA Implementation Strategy.

GRAND PRIZE Research

Entrants
Gwinnett County Department of Water Resources
CDM Smith
Stantec

Engineer in Charge
Jennifer Hooper, P.E.

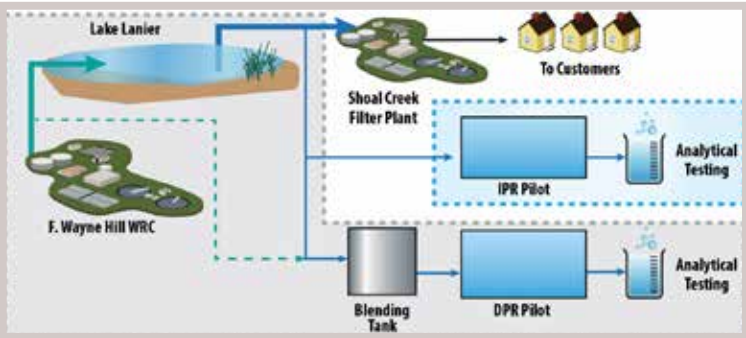
Direct Potable Reuse Pilot Testing of Ozone-Biofiltration/Research Project (WE&RF Reuse-15-11)

Lawrenceville, Georgia

Planned indirect potable reuse (IPR) and direct potable reuse (DPR) projects operated in California and Texas typically rely on treatment processes such as microfiltration/ultrafiltration (MF/UF), reverse osmosis (RO), and ultraviolet (UV) disinfection, with advanced oxidation processes (AOP). While this approach has proven to produce high quality drinking water, the treatment trains are capital and energy intensive, particularly for inland facilities where disposal of RO brine can be cost-prohibitive.

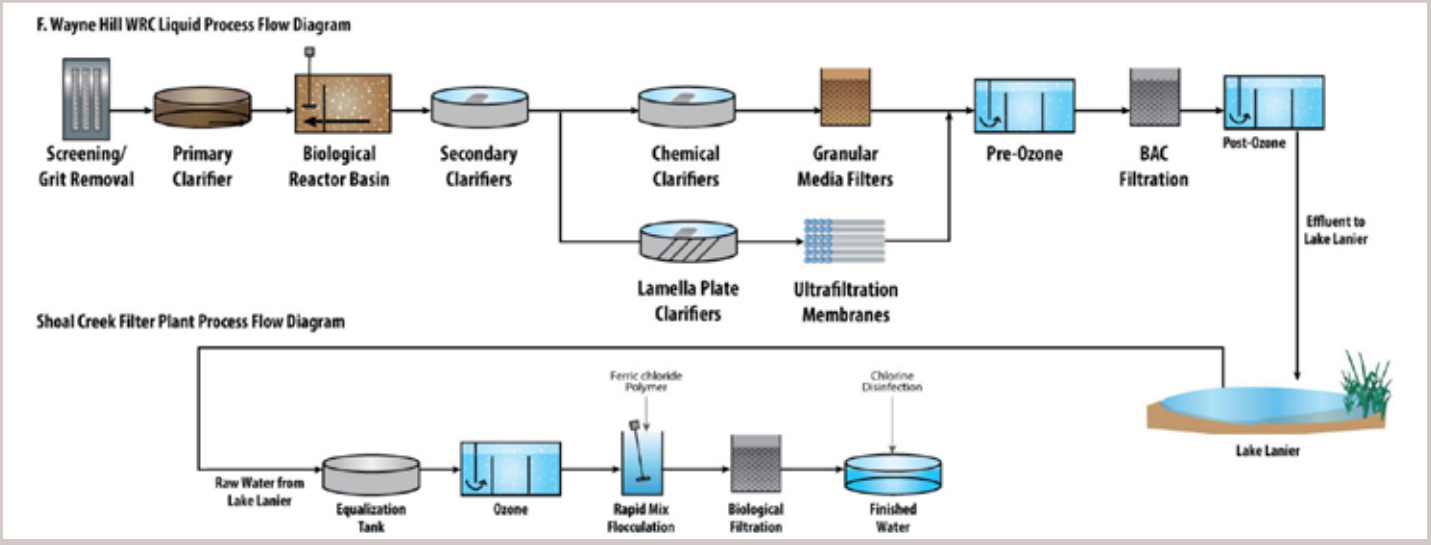
Gwinnett County, located in the greater metropolitan area of Atlanta, Georgia, implements planned IPR without RO. The F. Wayne Hill Water Resources Center (FWH WRC) utilizes ultrafiltration, pre-ozone, biologically active carbon (BAC) filtration and post-ozone disinfection to produce high quality water which is returned to Lake Lanier, the County's sole source of drinking water for over 900,000 residents. The drinking water treatment plants, Shoal Creek Filter Plant (SCFP) and Lanier Filter Plant, utilize ozone-biofiltration to produce high quality drinking water.

To fulfill its mission of providing superior water service at an excellent value, Gwinnett County Department of Water Resources (GC DWR) conducted a study to evaluate current treatment processes and future options for water supply. One goal was to evaluate the feasibility of using FWH WRC reclaimed water as a direct source of raw water supply for its drinking water facilities. Another objective was to evaluate if blending FWH WRC reclaimed water directly into the raw water would address seasonal operational challenges resulting from changes in lake water quality. This research project was funded by Water Environment & Reuse Foundation (WE&RF), now the Water Research Foundation, as Project 15-11. Pilot testing was completed in June 2017, and GC DWR, CDM Smith and Stantec are preparing the final technical report.



right Both the indirect potable reuse (IPR) and direct potable reuse (DPR) pilots replicated the treatment processes of the full-scale SCFP. The IPR pilot was fed Lake Lanier water only. The DPR pilot was fed various blends of FWH WRC effluent and Lake Lanier water. Both pilots were monitored and their performance was evaluated over a 9-month duration.

bottom Along with sampling and analytical testing on each pilot train, benchmark sampling was performed at strategic locations along the full-scale FWH WRC and SCFP at four-time points during the study.



GRAND PRIZE Small Firms

Entrant
AquaWorks DBO, Inc.

Engineer in Charge
Adam Sommers, P.E.

Florissant Water & Sanitation District Drinking Water Treatment Improvement Project

Florissant, Colorado

The Florissant Water and Sanitation District provides municipal water and wastewater service to about 250 residents. The district's drinking water treatment plant faced significant challenges and was under an enforcement order by the Colorado Department of Public Health and Environment to resolve several issues, including conforming with the surface water treatment rule and providing additional disinfection capabilities. Other issues that the district faced included managing iron and manganese loading, as well as resolving significant financial problems prohibiting the district from affording the necessary improvements.

The district's water was unpalatable. It was dark and stained most of that with which it came into contact. Because of this, most residents did not use the water, opting instead to use expensive bottled water. As a result, the district was not generating water sales which was adversely impacting the district's budgets. The district was consistently losing money each month and was unable to meet ongoing obligations.

AquaWorks DBO worked to engineer an affordable system that reduced iron and manganese to an acceptable level, adds filtration, and improves disinfection. The most innovative component was the implementation of a pretreatment tank that combines three treating processes in one step.

With AquaWorks DBO's assistance, the district was able to qualify for $1,058,000 in grants that covered 100% of the project's costs. Because of this, the district is now selling more water and is running in the black each month.

inset Water before and after treatment

below Direct filtration system about to be installed into existing building

GRAND PRIZE Small Projects

Entrant
CDM Smith

Engineer in Charge
Richard Tsang, Ph.D., P.E., BCEE

MSD Buncombe County, North Carolina - Sanitary Sewage Sludge Incinerator Improvements Project

Asheville, North Carolina

The Metropolitan Sewerage District (MSD) of Buncombe County, serving greater Buncombe County and northern Henderson County in western North Carolina, hired CDM Smith to rehabilitate their existing sanitary sewage sludge incinerator (SSI) at the French Broad River Water Reclamation Facility.

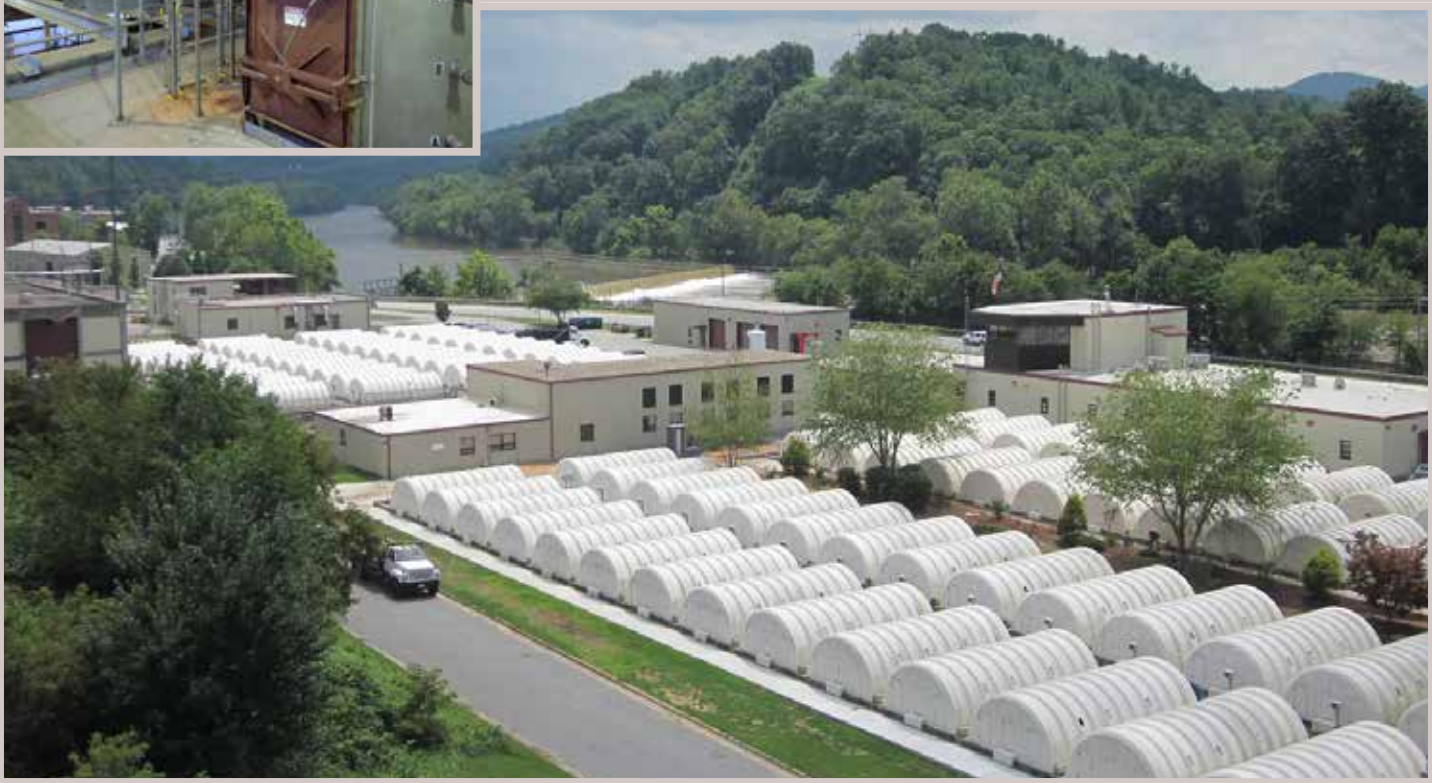
The project upgraded the emissions control system to comply with the Environmental Protection Agency (EPA) Maximum Available Control Technology provisions of the Clean Air Act by the established March 21, 2016 deadline, including stringent mercury emissions limits. CDM Smith provided preliminary design, final design, permitting, and construction phase services to MSD to implement this critical compliance project.

The mercury removal system uses sorbent polymer composite filter technology to achieve stringent mercury removal requirements. This innovative approach - one of the first municipal installations in the nation - saved more than $4 million in construction costs and will reduce future operation and maintenance expenses by reducing the volume of contaminated waste media requiring disposal. Successfully implementing this green project by an EPA-mandated deadline required pilot testing, close coordination, and a creative procurement process.

The completed improvements serve MSD's over 125,000 customers in Buncombe and Northern Henderson Counties - improving air quality for Western North Carolina citizen and tourists.

right The innovative SPC technology, added to MSD's air emissions control system, achieves EPA regulatory criteria, reduces contaminated waste disposal and saves $4 million in construction costs - which is crucial since no federal funding or assistance was made available.

bottom On the banks of the French Broad River, in a county that takes sustainability seriously, the MSD water reclamation facility is home to many unique technologies including one of the largest rotating biological contractor systems in the world, as well as one of only three facilities in North Carolina with a fluidized bed sanitary SSI.



GRAND PRIZE University Research

Entrants
Chih-Ming Kao, P.E., BCEE
Yih-Terng Sheu

Engineer in Charge
Chih-Ming Kao, P.E., BCEE

Remediation of Chlorinated Solvent-Contaminated Groundwater Using Long-Lasting and NZVI-Contained Colloidal Substrates with pH and Hydrogen Sulfide Control Capabilities: Innovative Substrate Development and Mechanism Studies

Kaohsiung, Taiwan

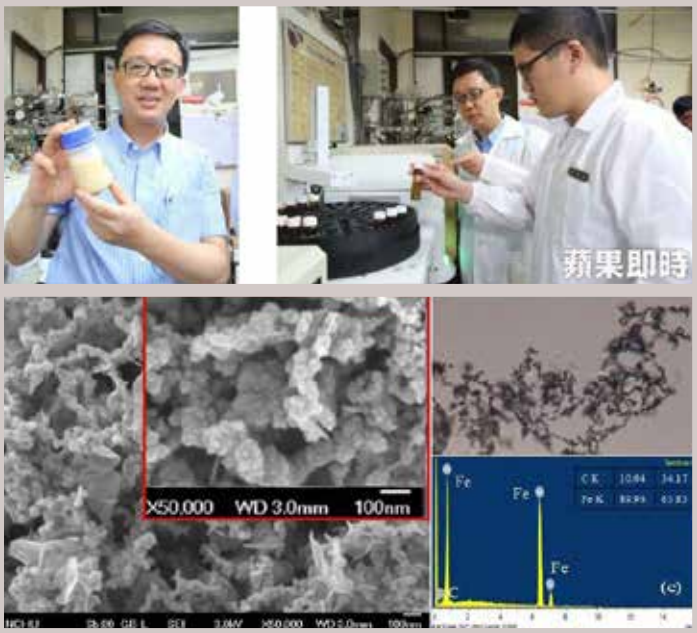
Professor Chih-Ming Kao has developed a long-lasting nZVI-contained emulsified colloidal substrate (LNECS) for continuous carbon and nanoscale zero-valent iron (nZVI) release to remediate trichloroethylene (TCE)-contaminated groundwater under reductive dechlorinating conditions. The developed LNECS contained nZVI, vegetable oil, surfactants (Simple Green™ and lecithin), molasses, lactate, and minerals. Patents have been approved and the technology transfer and full-scale practical application have been completed. In the full-scale practical application, the added LNECS caused the decrease in dissolved oxygen concentrations, decrease in ORP measurements, and increase in total organic carbon concentrations. Thus, LNECS could be used as the primary substrate to shift the oxidation-reduction stage of the subsurface environment from aerobic to anaerobic conditions.

The released nZVI from LNECS could react with sulfide and produce iron sulfide, thus preventing the odor and acidification problems due to the hydrogen sulfide and sulfuric acid caused by the injection of pure carbon substrates, e.g., emulsified substrate. Results show that the diversities of the microbial communities were increased after substrate supplement, and the addition of emulsified substrate caused the increase in the microbial diversity and changes of dominant microbial species. The emulsified solution served as the dispensing agent and nZVI particles could distribute in the emulsion evenly without precipitation and aggregation.

LNECS can be applied to enhance the in situ reductive dechlorination of TCE and other chlorinated compounds. The LNECS emulsion can be used to form biologically active permeable reactive barrier systems. The released nZVI could also degrade TCE via chemical reduction mechanism. The H2 produced by nZVI reduction could also enhance the anaerobic TCE dechlorination. Therefore, the application of LNECS would result in a more complete and efficient TCE removal compared to the injection of carbon substrate alone.

Compared to other substrates, using LNECS to enhance the reductive dechlorination of chlorinated solvents has the following advantages: (1) it could be used to provide carbon sources (electron donors) and nZVI for a long period of time with high total organic carbon concentrations; (2) It could create anaerobic conditions and result in the biodegradative reductive dechlorination and chemical reduction of chlorinated solvents; (3) The released nZVI from LNECS could produce hydroxide ion and the neutral pH could be maintained; (4) the released nZVI could produce iron sulfide, and odor problems could be minimized; (4) the released nZVI in the could react with the less biodegradable daughter products (e.g., VC) of the anaerobic biodegradation of chlorinated solvents, and thus, prevent the byproduct accumulation problem; and (5) emulsified oil serves as a good dispersing agent, which prevents the coagulation of the nZVI particles and extend the life of nZVI.

top Photos showing the developed innovative substrate.
bottom Results of SEM-EDS image.



HONOR AWARD Design

Entrant

CH2M, now Jacobs

Engineer in Charge

Rafael Vazquez-Burney, P.E.

Central Pasco County Beneficial Water Reuse Project: 4G Wetlands

Land O Lakes, Florida

The Central Pasco County Beneficial Water Reuse Project, known as the 4G Wetlands - the largest man-made groundwater recharge wetland in the world - was completed in 2017.

The 4G Wetlands consists of a 176-acre groundwater recharge wetland system constructed on upland pastures. The system is sized to receive 5 mgd of advanced secondary reclaimed water to passively recharge the surficial and Upper Floridian Aquifers (the region's drinking water supply), while protecting its water quality.

CH2M (now Jacobs), alongside Pasco County Utilities and the Southwest Florida Water Management District, provided a full range of design, permitting, and services during construction for the multifunctional project addressing decades-long concerns associated with groundwater drawdowns in areas affected by public water supply wellfields.

Aerial photo of the Pasco County's Beneficial Water Reuse Project, known as the 4G Wetlands.

In addition to the benefits to the aquifer and regional water resources, the project will restore the ecological functions of the historically degraded onsite lakes and wetlands, and creates 176 acres of new wildlife habitat within the 15 constructed wetland cells.

HONOR AWARD Industrial Waste Practice

Entrant

HDR

Person in Charge

Mary Shanks

Factoria Recycling and Transfer Station

Bellevue, Washington

The Factoria Recycling and Transfer Station is an 80,000 ft^2 facility capable of handling 225,000 tons of garbage, recycling, and yard and household hazardous wastes annually.

The King County Solid Waste Division (KCSWD) knew it needed a new transfer station twenty-five years ago as the previous one failed to accommodate future growth or recycling. HDR's flat-floor transfer station design offered flexibility to adjust to KCSWD's future need. With the ease of drop-off, variable traffic flow, improved safety and future flexibility, KCSWD is requiring future transfer stations to also be flat-floor designs.

The new station uses 40 percent less energy than standard energy-efficient buildings - reducing carbon dioxide emissions by 172 tons annually - by featuring automatic dimming lights and translucent skylights and window panels to allow in natural light. Additionally, the rainwater catchment system is anticipated to save approximately 1.3 million galls of potable water annually.

Solid waste handling buildings are considered essential public facilities in Washington State. Since Factoria Recycling and Transfer Station provides a critical function in the community, especially during recovery from natural disasters, the building was designed for immediate occupancy following a natural disaster, including a major seismic event.

Built to maximize employee safety, the building uses natural ventilation and a misting system for dust and odor control, which provides cleaner air for employees and energy savings by reducing ventilation equipment usage.

Throughout the three-year project, services remained uninterrupted and operational. The station was completed in August 2017.

HONOR AWARD Planning

Entrant
HDR

Person in Charge
Christine Roarke

Toronto Long Term Waste Management Strategy

Toronto, Ontario, Canada

Working with the City of Toronto, HDR developed a Long Term Waste Management Strategy that provides an innovative approach to the future of solid waste management and aligns with the City's goal of a zero waste future.

The City of Toronto had already developed and implemented the major components of a fully integrated waste management system that already ranks amongst the best in North America. Focusing on the 5Rs (reduction, reuse, recycling, recovery and residual disposal), the Strategy seeks to minimize waste disposal and to move the City towards a circular economy that views waste as a resource.

The next step for Toronto will be to take its already world class program and make it even better through enhancements to the current system, new programs and initiatives, further active engagement and advocacy with key producer/waste industry sector stakeholders and continued focus on public education, promotion, and resident involvement.

The City of Toronto owns two organics processing facilities that digest collected organic material through anaerobic digestion.

The Strategy will serve Toronto for the next 30 to 50 years, focusing on sending less material to the landfill and emphasizing the importance of community engagement and encouraging the prevention of waste.

HONOR AWARD Research

Entrant
Orange County Water District

Engineer in Charge
Dr. Megan Plumlee, P.E.

A Simple, Cost-Effective Method for NDMA Analysis in Drinking Water and Recycled Water to Improve Public Health Protection

Fountain Valley, California

The Orange County Water District (OCWD) has tested and validated a cost-effective method of analysis for N-nitrosodimethylamine (NDMA) in drinking and recycled water.

NDMA is a carcinogenic disinfection byproduct that is formed when compounds react with the water disinfectant chloramine. While not yet federally regulated, California has a drinking water notification level at 10 ng/L and is regulated in permitting guidelines for potable reuse (recycled water) projects in the state. Other states and countries have also begun publishing guidelines and monitoring NDMA, and the US EPA is considering future regulation.

Monitoring for NDMA is expensive, time-consuming, requires costly instrumentation, and the collection of large volumes of water. This new method, utilizing a prototype instrument, requires less time and labor compared to conventional methods as well as a smaller initial investment in instrumentation while achieving the same detection limits. The technology has also been adapted to function as an online, near real-time monitoring instrument, which has great potential for operational and regulatory use at water treatment facilities.

The novel NDMA analytical method instrument (HPLC-PR-CL) consists of high-performance liquid chromatography (unit 1), use of an anion exchange module (controller is unit 2), a C18 reverse phase column and column oven (unit 3), the addition of luminol chemiluminenscence reagent (unit 4), and a chemiluminescence detector (not shown).

This project is a partnership with Kagoshima University and Nagasaki University (prototype instrument developers) and is funded by OCWD and The Water Research Foundation.

HONOR AWARD University Research

Entrant
Dr. Robert W. Nairn, University of Oklahoma

Engineer in Charge
Russell C. Dutnell, P.E.

Southeast Commerce Mine Water Passive Treatment Project

Norman, Oklahoma

The Tri-State Mining District (TSMD) was a major producer of lead and zinc concentrations in the 19th and 20th centuries. Identified by the US EPA as one of four TSMD-related CERCLA (Superfund) Sites in Oklahoma, Kansas, and Missouri, the Oklahoma portion contained more than 95 million m^3 of contaminated water, which eventually flooded and devastated the water quality of Tar Creek.

Dr. Robert W. Nairn and his research group (Center for the Restoration of Ecosystems and Watersheds - CREW) were charged with developing an ecologically engineered system to address the upwelling mine water at the Southeast Commerce (Oklahoma) Site. Development of the Southeast Commerce passive treatment system (PTS) required an in-depth understanding of the surface water hydrology (recharge) and hydraulics of the underground mine workings.

The intent of this project was to construct a passive treatment system that would address contaminated mine drainage water quality associated with discharges from the reclaimed surface collapse features located on the site. The mine water associated with this project is typical of Tar Creek mine drainage and contains elevated iron, zinc, lead and cadmium concentrations. Construction work on the site was completed in the spring of 2017.

Aerial Photograph of Completed Southeast Commerce Passive Treatment System

The 2018 AAEES *Honorees*

The AAEES Awards were established to honor and recognize distinguished environmental engineers, environmental scientists, educators, students, and professionals. Congratulations to the individuals profiled on the following pages who stand as both pioneers as well as the future of environmental engineering and science.

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; and significant contributions to the control of the quality of the world's environment. The Gordon Maskew Fair Award was established in 1971.

Debra R. Reinhart, Ph.D., P.E., BCEE

Dr. Debra Reinhart is a Pegasus Professor and Assistant Vice President for Research and Scholarship at the University of Central Florida and a member of the Civil, Environmental and Construction Engineering Department. She holds a B.S. in Engineering from Florida Technological University, and an M.S. in Sanitary Engineering and a Ph.D. in Environmental Engineering from Georgia Institute of Technology.

Dr. Reinhart served from 2011-2013 as the Environmental Engineering Program Director at the National Science Foundation in Arlington, Virginia. Prior to entering academia, Dr. Reinhart was a consulting engineer for Keck and Wood and CH2M Hill, both in Atlanta, Georgia. She was also Chief of the Research and Development Division of the Bureau of Pollution Control for the City of Atlanta, Georgia.

Dr. Reinhart's research area is solid waste management, with a focus on optimized waste collection and sustainable operation of landfills. Her research has been supported by grants from and contracts with both government agencies and private companies, with research support from the federal government (U.S. Environmental Protection Agency through subcontractor ARCADIS, and the National Science Foundation), core funding from the State of Florida (Hinkley Center for Solid and Hazardous Waste Management), and from the Environmental Research and Education Foundation. Dr. Reinhart is an Associate Editor for the *Waste Management Journal*, a member of the Managing Board of the International Waste Working Group, and a member of the Environmental Research and Education Foundation Board. In addition, she is a member of the ABET Engineering Accreditation Commission and serves as an ABET program evaluator. She has served on the American Society of Civil Engineer's Report Card for America's Infrastructure Committee for the last three report cards.

Dr. Reinhart has received national recognition from National Aeronautics and Space Administration, AAEES, the Tech Museum of Innovation, Solid Waste Association of North America and others. She is a registered professional engineer in Florida and Georgia, a Board Certified Environmental Engineer, and Fellow of the American Society of Civil Engineers and the American Association for the Advancement of Science.

Dr. Reinhart has been quite active with AAEES. In addition to her ABET volunteer efforts, she was on the AAEES Board of Trustees from 1992 - 2010 and was the President in 2009. She chaired the Environmental Engineering Body of Knowledge Task Force which produced the *Environmental Engineering Body of Knowledge* in 2009. She has served on numerous committees for AAEES, including Strategic Planning, Policies and Procedures, Education, Solid Waste, Membership, Development and Outreach, Awards, Nominating, and Seminars and Workshop committees, the Website Working Group and has been on the board of the Environmental Engineering and Science Foundation.

She has been a Board Certified Environmental Engineer in Solid Waste Management since 1994 and was the 2014 recipient of the Stanley E. Kappe Award.

Congratulations

Science Award

The AAEES Science Award is given to an individual who is an outstanding performer in the management and implementation of environmental science programs and projects conducted under either public or private auspices and has demonstrated exemplary professional conduct, has distinguished qualities of personal leadership, originality in devising new management techniques for dealing with environmental issues, and sensitivity and responsiveness to the impact of social and political influences on the conduct of environmental programs. The Science Award is new for 2018.

Joel Gerard Burken, Ph.D., P.E., F. AEESP, BCEE

Dr. Burken received his Ph.D. from the University of Iowa in 1996, where he conducted some of the initial research on phytoremediation. He has been at Missouri University of Science and Technology (formerly University of Missouri - Rolla) since 1997. He currently serves as Chair and Curators' Distinguished Professor of the Civil, Architectural and Environmental Engineering Department, and is a member of the US EPA Science Advisory Board. Dr. Burken has also held temporary positions at: EAWAG in Zurich Switzerland (research intern), at the National Environment Research Institute (NERI) in Denmark (visiting researcher and OECD Fellow) and at the University of Canterbury, New Zealand as an Erskine Fellow.

Joel's research has focused upon low impact and natural treatment systems since 1991. In that time, terms of sustainable-remediation, green infrastructure, and green-remediation have evolved and now promote the same fundamental aspects surrounding water quality and water resource management. His research in phytoremediation of organic contaminants and pioneering work in Phytoforensics have led to over 84 publications, a patented environmental assessment method, and international recognition with multiple research, teaching and service awards. This recognition includes twice winning the ASCE Rudolf Hering Medal, an NSF Career award, and being appointed a Fellow of the Association of Environmental Engineering and Science Professors (AEESP).

Dr. Burken has received the highest Missouri S&T awards for teaching, service, advising and has received the Faculty Excellence award 7 times. Dr. Burken was appointed as a Distinguished Curator's professor at Missouri S&T in 2015. His publications include 6 articles cited over 100 times each, and one article that was highlighted in the American Academy for the Advancement of Science (AAAS) journal *Science*.

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.

Karen L. Pallansch, P.E., BCEE

Ms. Pallansch currently serves as CEO for Alexandria Renew Enterprises, previously known as the Alexandria Sanitation Authority. She has served as CEO for twelve years, during which time she led a rebranding effort that incorporated a successful a public - developer partnership.

Prior to her work with AlexRenew, Ms. Pallansch worked for the Virginia Department of Environmental Quality as a Senior Engineer and as a General Engineer with the Department of the Army, charged with rehabilitating army ammunition bases and managing munitions research.

Ms. Pallansch has a Bachelor's Degree in Chemical Engineering from the University of Pittsburgh and a Master's Degree in Business Management from Texas A&M University, Texarkana. She is a registered Engineer in the Commonwealth of Virginia, has a Class I wastewater license, is a Water Environment Federation Fellow, and is a Diplomate with the American Academy of Environmental Engineers and Scientists.

The 2018 AAEES *Honorees*

Ms. Pallansch volunteers with several organizations, including the National Association of Clean Water Agencies (NACWA) where she serves as a Board member. She is a board member of the Virginia Municipal League Insurance Pool and also serves on the board of the Alexandria Chamber of Commerce, Alexandria First Night, and the WateReuse Foundation. She was previously chair of the Water Environment Research Foundation Research Council and served as an ex officio member of the WERF Board.

Ms. Pallansch was recently named a 2017 Northern Virginian of the Year by *Northern Virginia* magazine and a Woman Who Means Business by the *Washington Business Journal*.

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.

Daniel B. Oerther, Ph.D., P.E., BCEE

Daniel B. Oerther, PhD, PE, BCEE, D.AAS, CEP, C.Eng, M.CIEH, C.Env, is a Professor of Environmental Health Engineering at the Missouri University of Science and Technology in Rolla. His service to AAEES includes: Audit, Finance, Membership, and Strategic Planning committees; member of the Board of Trustees; and since 2013, Treasurer of the Academy. Dan founded and funded the Academy's Student Team Award. He has received numerous awards from AAEES, including: the 2009 Excellence in Environmental Engineering and Science (E3S) University Research Honor Award for, "Improved Water Quality in Northwest Tanzania"; 2014 Excellence in Environmental Engineering and Science Education Award; 2016 E3S Superior Achievement Award for, "Improved Water Quality in Ixcan, Guatemala" (only the second time in E3S history that a University Research Project has won the overall Superior Achievement Award), the 2017 Pohland Medal for, "bridging research, education, and practice," and the 2018 Kappe Award for, "advancing public awareness to the betterment of the environment and the objectives of the Academy."

Professor Oerther earned his doctorate from the University of Illinois, and he was previously Department Chair at the University of Cincinnati. Dan uses environmental biotechnology to achieve sustainable development at the nexus of water quality and food security. He co-founded/directed: NSF GK-12 Project STEP at Cincinnati; Ohio Center for Excellence in Sustaining the Urban Environment; Environmental Research Center at Missouri; and Missouri Center for Science Diplomacy Laboratory. He served as major advisor for 14 doctoral and 22 masters students, and he co-authored more than 150 peer-reviewed publications. Dan's leadership experience includes: Associate Editor, *ASCE Journal of Environmental Engineering*; Chair, WEFTEC Research Symposium; Associate Editor, *Water Environment Research*; Board of Directors, AEESP; Program Evaluator, ABET; Mayor's Steering Committee for the Green Cincinnati Plan; Phelps County (Missouri) Extension Council; and Environment, Science, Technology, and Health (ESTH) Advisor to the United States Secretary of State.

Professor Oerther is a licensed Professional Engineer in three states, a Diplomate of the American Academy of Sanitarians (D.AAS), and he is Certified by the Academy of Board Certified Environmental Professional (CEP). He regularly consults for industry (ARCADIS, CH2M, and others) and government (United Nations, World Bank, and others). Dan is a Jefferson Science Fellow of the U.S. National Academies, a Lifetime Honorary Fellow of the American Academy of Nursing (F.AAN), and both a Fellow of the Royal Society for Public Health (F.RSPH) and a Fellow of the Royal Society for Arts (F.RSA) in the United Kingdom where he is also registered as a Chartered Engineer (C.Eng, equivalent to BCEE), a Member of the Chartered Institute of Environmental Health (M.CIEH, equivalent to D.AAS), and as a Chartered Environmentalist (C.Env, equivalent to BCES).

Congratulations

Honorary Member

One or more Honorary Members 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.

Rita Rossi Colwell, Ph.D.

Dr. Rita R. Colwell is the Distinguished University Professor at University of Maryland College Park and Johns Hopkins University Bloomberg School of Public Health; Global Science Officer and Chairman at CosmosID, Inc.; and Senior Advisor and Chairman Emeritus at Canon U.S. Life Sciences.

Dr. Rita Colwell's interests are focused on global infectious diseases, water, and health, and Dr. Colwell developed an international network to address emerging infectious diseases and water issues, including safe drinking water for both the developed and developing world, in collaboration with Safe Water Network, headquartered in New York City.

Dr. Colwell served as the 11th Director of the National Science Foundation, 1998-2004. In her capacity as NSF Director, she served as Co-chair of the Committee on Science of the National Science and Technology Council. One of her major interests includes K-12 science and mathematics education, graduate science and engineering education and increased participation of women and minorities in science and engineering.

Dr. Colwell served as President of the University of Maryland Biotechnology Institute and Professor of Microbiology and Biotechnology at the University Maryland. She was also a member of the National Science Board from 1984 to 1990.

Dr. Colwell has been awarded 61 honorary degrees from institutions of higher education, including her Alma Mater, Purdue University and is the recipient of the 2005 Order of the Rising Sun, Gold and Silver Star, bestowed by the Emperor of Japan, the 2006 National Medal of Science awarded by the President of the United States, the 2010 Stockholm Water Prize awarded by the King of Sweden, the 2017 Vannevar Bush Award from the National Science Foundation, and the 2017 International Prize for Biology from the Japan Society for the Promotion of Science. Dr. Colwell is an honorary member of the microbiological societies of the UK, Australia, France, India, Israel, Bangladesh, Czechoslovakia, and the U.S. and has held several honorary professorships, including the University of Queensland, Australia. A geological site in Antarctica, Colwell Massif, has been named in recognition of her work in the Polar Regions.

Dr. Colwell has held many advisory positions in the U.S. Government, nonprofit science policy organizations, and private foundations, as well as in the international scientific research community. She is a nationally-respected scientist and educator, and has authored or co-authored 19 books and more than 800 scientific publications. She produced the award-winning film, *Invisible Seas*, and has served on editorial boards of numerous scientific journals.

Dr. Colwell has previously served as Chairman of the Board of Governors of the American Academy of Microbiology and also as President of the American Association for the Advancement of Science, the Washington Academy of Sciences, the American Society for Microbiology, the Sigma Xi National Science Honorary Society, the International Union of Microbiological Societies, and the American Institute of Biological Sciences (AIBS). Dr. Colwell is a member of the U.S. National Academy of Sciences, the Royal Swedish Academy of Sciences, Stockholm, the Royal Society of Canada, the Royal Irish Academy, the Bangladesh Academy of Science, the Indian Academy of Science, the American Academy of Arts and Sciences, and the American Philosophical Society.

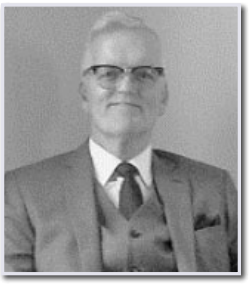
Dr. Colwell has a B.S. in Bacteriology and an M.S. in Genetics from Purdue University, and a Ph.D. in Oceanography from the University of Washington.

The 2018 AAEES *Honorees*

International Honorary Member

One or more International Honorary Members 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.

Professor Steve Burnage, PPSEE, CEng, CEnv, Hon.FSEE, FIMechE



Steve is registered with the Engineering Council (UK) as a Chartered Engineer (CEng), as well with the Society for the Environment (UK) as a Chartered Environmentalist (CEnv). He is an Honorary Fellow of the UK Society of Environmental Engineers (SEE) and a Fellow of the UK Institute of Mechanical Engineers. He is recently retired from Lockheed Martin UK, where he was Head of Engineering Integrity and an LM Fellow in recognition for his work in Composite Material Development, Application, Analysis and Disposal. He is currently a Professor at the University of Surrey (UK) and sits on the Centre for Doctoral Training (CDT) Steering Group.

He has, for more than 20 years, been an active member of the UK Society of Environmental Engineers (SEE), including three years as President. He is currently Chairman of the SEE Education and Membership Committee as well as a member of the Main Council. He is currently focusing his effort on promoting environmental engagement amongst licensed, certified and registered environmental engineers and scientists by working with their associated National and International professional bodies. He is active in expanding the definition of 'environmental engineering' within the SEE to encompass those engineers and scientists who manage the impact of the environment on the performance of engineering systems, along with how engineering systems impact the health of the environment.

He was awarded this year's International Honorary Member of AAEES for his thoughtful leadership in bringing together diverse approaches to environmental engineering and science to protect the environment; for his pioneering leadership integrating sustainability into the practice of environmental engineering and science in the UK; and for his sustained leadership advancing the professional practice of environmental engineering and science.

Congratulations

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 AEESP and is sponsored by Innovyze.

Ahmed Abokifa, Washington University of St. Louis — Faculty Advisor: Pratim Biswas

Ahmed Abokifa is currently a Ph.D. candidate in the department of Energy, Environmental, and Chemical Engineering at Washington University in St. Louis. He is on schedule to graduate in May and afterwards, he will be joining the University of Texas at Austin as a postdoctoral fellow in the Center for Water and the Environment. He hold both a BS and MS degrees in Civil Engineering from Cairo University.

Ahmed is interested in studying urban water infrastructure systems, specifically through addressing some of the substantial challenges that face our modern societies to manage, preserve, and upgrade them in order to guarantee the continuous supply of clean water for all our residential, commercial, and industrial demands. Under this umbrella, his Ph.D. research has been mainly focused on modeling and monitoring the water quality in drinking water distribution systems. He uses various computational approaches to understand the fundamental physical, chemical, and biological processes that dictate the water chemistry. As a part of a large research team, his task has been to develop multi-scale water chemistry models, ranging from continuum-scale reactive-transport models to understand the fate and transport of different compounds in the water system, to mathematical optimization and machine learning models implemented for system-level management and control.

In addition to research, Ahmed also has a strong passion for teaching and education. He has participated in the instruction of several courses in the broad fields of Civil, Environmental, and Chemical Engineering at three different academic institutions: Washington University, Cairo University, and the American University in Cairo.

W. Wesley Eckenfelder Graduate Research Award

This award is given annually to recognize an environmental engineering or environmental science graduate student whose research contributes to the knowledge pool of wastewater management. The W. Wesley Eckenfelder Graduate Research Award was established in 2012 in association with the AEESP and the Environmental Engineering and Science Foundation.

Andrew Pfluger, Colorado School of Mines — Faculty Advisors: Junko Munakata-Marr and Linda Figueroa

Lieutenant Colonel Andrew Pfluger, U.S. Army, is an active duty officer and a Ph.D. candidate at the Colorado School of Mines in Golden, Colorado. Andrew's research interests revolve around microorganisms in engineered environmental systems, including biological wastewater treatment. His doctoral research has centered on the characterization of anaerobic bioreactors for treatment of domestic wastewater.

Upon graduation from Mines in the summer of 2018, Andrew will serve as an Assistant Professor at the United States Military Academy in the Department of Chemistry and Life Science. Andrew previously served as a rotating faculty member at USMA in the Department of Geography & Environmental Engineering from 2010 to 2013.

Andrew earned a B.S. in Civil Engineering from USMA and a M.S. and Engineer Degree in Environmental Engineering and Science from Stanford University. Andrew is also a licensed PE in the state of Delaware.

The 2018 AAEES *Honorees*

Excellence in Environmental Engineering and Science Education

The E4S 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 and Science Education Award was established in 2012 and is jointly administered by AAEES and AEESP.

Dr. Richard Valentine, University of Iowa

Richard Valentine obtained degrees in chemistry and chemical engineering from the University of Michigan in 1973, and a Ph.D. in environmental engineering in 1982 from the University of California, Berkeley. He has been a faculty member in Civil and Environmental Engineering at the University of Iowa since 1982, teaching courses in environmental chemistry, physical-chemical water treatment processes, and courses in engineering for freshman emphasizing strategies for creative problem solving.

Dr. Valentine has made pioneering contributions in both theoretical and practical applications of environmental chemistry and process design. This includes disinfection byproducts (DBPs) research, as applied to drinking water treatment and water distribution systems.

He is the leading authority on chloramine reaction kinetics, which governs the stability of the disinfection process. He developed a simple, practical relationship for predicting how fast chloramines decompose in the distribution system, which is used as a guide in implementing the chloramination process.

Dr. Valentine developed an inexpensive and robust process to remove radium from drinking water based on its adsorption to hydrous manganese oxides, the first use of a metal oxide to treat drinking water. The process has been commercialized and has been widely adopted. He also described a mechanism accounting for the instability and subsequent dissolution of lead oxides when chloramines are used in disinfection.

W. Brewster Snow Award

This award is given annually to recognize an environmental engineering graduate student who has made significant accomplishments in an employment or academic engineering project. The W. Brewster Snow Award was established in 2011 in association with the AEESP and the Environmental Engineering and Science Foundation.

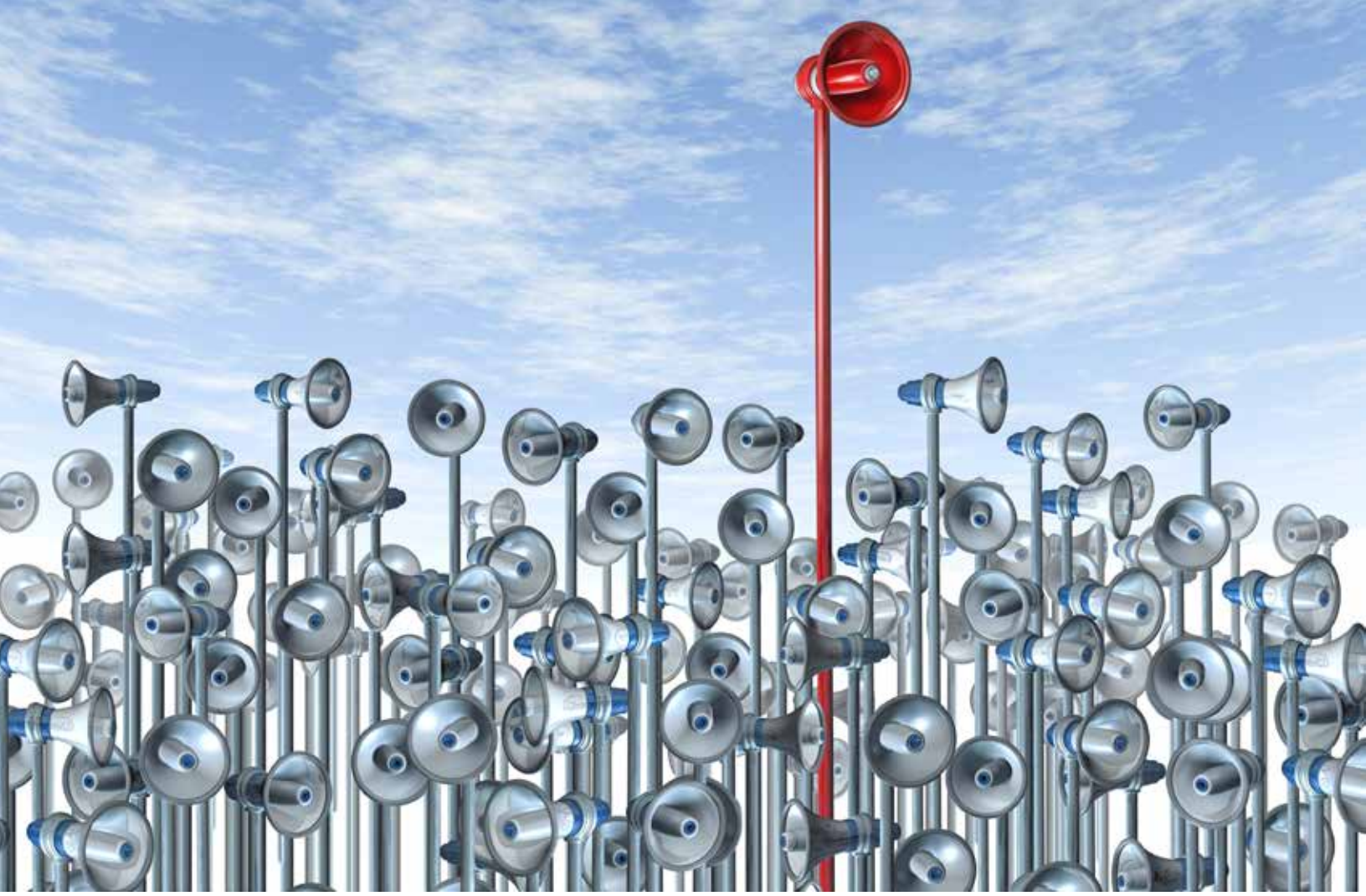
Ms. Maria Briones, University of South Florida

Maria Briones graduated from the University of Rhode Island (URI) in the International Engineering Program (IEP) with a BS in Civil Engineering and a BA in Spanish Language. Through the IEP, she spent a year in northern Spain studying and working at a research facility, Centro de Estudios e Investigaciones, in the field of computational fluid dynamics to model aeration efficiency in wastewater treatment. Maria also received experience in Dr. Vinka Craver's lab at URI, working on developing a method to measure nitrous oxide levels of reactivated sludge.

Maria is currently a Master's candidate at University of South Florida where she will graduate in 2018 with an MS in Civil Engineering with an International Development Engineering focus. Her current GPA is 3.91. Her MS thesis research, based on her time and experience as a water, sanitation, hygiene Peace Corps volunteer in Panama (RPCV '15-'17), is a validation of a gravity fed water distribution design computer program, Neatwork, against field data obtained in a rural community in Panama. While in Panama she also worked with a village of 100 people to improve sanitation through the design and construction of latrines and a water distribution system.

She has been an active member of Engineers for a Sustainable World, American Society of Civil Engineers, and Theta Tau Engineering Fraternity.

Maria currently works part time at CH2M (now Jacobs Engineering Group) in the water sector while she completes her MS thesis requirement. There, she supports the project management of storm and wastewater projects.



2018 Environmental Communications Awards

The Environmental Communications Awards Competition was launched in 2012 in cooperation with the International Water Association and the Project Innovation Awards.

Recognizing that communication with the public at large and other constituents can be a complex and challenging issue, this competition was developed to highlight this daunting task. Communication and marketing plans must be designed to address the objectives and strategies of the campaign to reach a target audience.

The criteria for judging the Environmental Communications Awards:

- Innovative approach to messaging or branding
- Future value to the water engineering profession
- Creativity and clarity in portraying and communicating the messages
- Effectiveness in delivery and achieving desired outcomes
- Integrated Design Approach - Narrative and visual elements work together to achieve the communication objectives.

This award is designed to recognize oustanding environmental communication efforts by industry; municipal, state and federal governments; and consulting firms to convey their important environmental messages to the public and other stakeholders.

The winner of this award is automatically qualified to enter the International Water Association's Project Innovation Award competition for Marketing and Communications-North American Category.

Profiles of the winning projects are on the following pages. Full profiles of winning projects are online at http://www.aaees.org/ecommcompetition.

THANK YOU TO OUR 2018 ECOMM PANEL OF JUDGES

- **Robert Smith**
- **Yang Deng**
- **Xiaoning Zhang**

GRAND PRIZE

Entrants

Orange County Water District and Orange County Sanitation District

Person in Charge

Eleanor Torres

GWRS Bottled Water Campaign

Advanced Purified Bottled Water Campaign Stimulates Public Acceptance of Water Reuse

A safe, reliable water supply touches all of our lives. The Groundwater Replenishment System (GWRS) is the world's largest advanced water purification project for potable reuse and its product water exceeds federal drinking water standards. A collaboration between the Orange County Water District (OCWD) and the Orange County Sanitation District (OCSD), it has been online since 2008. It supplements Orange County's (CA) groundwater, providing 100 million gallons a day.

The biggest detriment to building similar projects is the perceived "yuck" factor. For the GWRS, OCWD and OCSD created a successful communication campaign that included having tour guests drink product water. Tour survey results, even today, show that the number of guests who strongly support advanced purified wastewater as part of their drinking water supply nearly double (34.14% to 64.40%) after the tour and tasting.

It stood to reason that putting recycled water in consumers' hands to test for themselves, coupled with verbal and/or print information, would help to overcome "toilet-to-tap" misconceptions and gain support of water reuse for future infrastructure and program investments on the public's behalf.

CAMPAIGN STRATEGY

In 2016, OCWD, OCSD and WateReuse California led efforts to pass AB 2022, which now allows the bottling of advanced purified water for educational purposes. OCWD and OCSD became the first to bottle such water in the Western Hemisphere. In 2017, OCWD and OCSD began a California "bottled water tour" to educate general and targeted publics about the safety, quality and taste of reused water in efforts to help similar reuse projects gain community support and ultimately help California be water-secure during droughts. It started in March 2017 with pre-kick-off industry and legislative events and culminated in a rousing Winter Fest celebration of the GWRS 10th anniversary and setting a Guinness World Record for the most wastewater recycled to drinking water in 24 hours on Feb. 16, 2018.

Staff and board members would go out to established events to reach California masses - general public, students, water industry personnel, business and civic leaders, and legislators. Extra effort was placed on targeting Millennials (ages 18-34), the largest influential and technologically literate generation group.

Additionally, engaging media to cover the campaign launch, Guinness World Records attempt and Winter Fest celebration, and reaching out to both reporters and social media influencers to take the #GetOverIt! water taste challenge would go a long way in gaining support.

Goals and Objectives

- Convey advanced purified water as the water future
- Celebrate and reinforce technological progress using GWRS as example

GWRS Brochures translated from English into 4 Languages: Chinese, Spanish, Korean, And Vietnamese

Public Exhibition
People Invited To Visit Interactive H2o Learning Center At OCWD

- Reinforce OCWD and OCSD leadership roles in water reuse
- Support other agencies' water reuse projects/events
- Continue/increase public acceptance of water reuse
- Engage new audiences

Messages About Advanced Purified Water

- It is safe
- It tastes good
- It is a new source of water (necessary during droughts)
- It is environmentally friendly (less energy than imported or desalinated water; diverts billions of gallons of wastewater from the ocean)
- It costs less than imported or desalinated
- It is reliable

Campaign Tools

- Brochures
- Direct Mail Campaign
- Joint Effort with Agency/Firm
- Media Kits
- Presentations
- PR Campaigns
- Public Surveys
- Public Exhibition
- Special Events
- Videos
- Website
- Social Networking
- Other-Op-eds

RESULTS

Kick-off

A PRNewswire release was picked up on 223 news and information websites, with potential views of 88 million. It has been viewed more than 4,000 times via the PRNewswire channels that can be tracked and includes web crawler hits (equating to a strong search engine result because of the release's keywords) and it generated 23 news media views. Four times as many or more actual views occur (but simply can't be tracked through PRNewswire's electronic channels).

All attending news media broadcast one or more stories on Southern California television news stations and at least one station "syndicated" its video and story via the CNN network to TV news stations across the country. KNX broadcast its story multiple times during the day. Combined with the Southern California Newspaper Group of newspapers, total potential audience impressions exceeded 150 million. City News Service, a wire news service that covers Southern California, and several other news sites published stories as well.

Guinness World Record/Winter Fest

Combined news coverage for the World Record and Winter Fest reached more than 350 million potential readers, listeners and viewers.

The PRNewswire release had the same reach as mentioned above. Placement included Yahoo, Marketplace and TheStreet.com. The release generated 159 media views on the PRNewswire website as well as more than 600 views from the general public. Local TV news stations provided onsite reports and NPR and CBS This Morning took audio and footage to use at a later date. Other media placements, such as with industry trades (i.e., Waste Today Magazine), continued for the next few weeks.

Additional Results

- At every event, bottles of GWRS water were given out and people - most of them new to advanced purified water - were engaged. A total of 13,000 bottles were given out and nearly 17,000 people were engaged.
- More than 80 reporters and social media influencers received press kits with water and a written request to take the #GetOverIt! taste challenge and post results. Nearly 20 took the challenge and posted favorable messages about recycled water to thousands of their followers. More than 100,000 people were reached on social media.
- 21,000 WEFTEC 2017 attendees cheered as WEF's President drank GWRS bottled water onstage.
- The TEDx conference was viewed by 5,250 people.
- 4, 569 attended onsite tour program

CONCLUSION

The "bottled water tour" drew peoples' attention to state and local water needs and provided knowledge about water reuse as a viable new source. The tour provided palatable and useful information to spur the acceptance of water reuse projects to benefit current and future generations. The large number (11) of legislators who attended or sent resolutions for the GWRS anniversary is significant in showing support for water reuse in California.

HONOR AWARD

Entrant
Sanitation Districts of Los Angeles County

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

Converting Waste into Resources at the Sanitation Districts

The Sanitation Districts have a legacy of cost-effectively converting waste into resources such as recycled water, renewable energy, and recycled materials. Southern California's complex jurisdictional boundaries have allowed this service to occur largely unnoticed for the past 95 years. However, the recent need to invest in aging infrastructure identified in the 2050 Master Facilities plan, made it essential to develop collaborative engagement as a strategy for realigning the comprehensive outreach program with evolving community needs.

Over the past four years, the Sanitation Districts have promoted environmental sustainability through robust community partnering and engagement programs. Effective messaging requires active collaboration with community-based organizations including nonprofit groups, professional associations, educational institutions and sister agencies. The strategy supports lifelong engagement through environmental education materials developed for specific stakeholder groups.

The Sanitation Districts plan uses a variety of communication platforms designed around regional interests (Neighbors, Professionals, Students) to reach specific stakeholder groups such as neighbors, professionals, and students.

COLLABORATION

The Sanitation Districts invigorated its online public education strategy in 2014 with new platforms. The first step was to evaluate stakeholder groups and assess interests. Then mission centric content was developed specific to group interests.

Platforms and stakeholder groups:

- Google My Business (neighbors and professionals)
- Yelp (neighbors and professionals)
- Facebook (neighbors)
- Twitter (neighbors, students and professionals)
- Websites (all stakeholders)
- Information line (all stakeholders)

The collaboration strategy relies on content developed in many media that adjusts to evolving group interests. Outreach materials fill specific environmental education needs and are thereby re-broadcast, increasing the sphere of influence. The first phase focused on transparent communication by claiming rogue sites and pushing out accurate information. Once authentic content was accessible, the strategy shifted to interaction.

To ensure that the strategy supports the Sanitation Districts' mission and vision all content is anchored in three core values. Each value includes a correlated guiding principle.

LEADERSHIP

The Sanitation Districts is a utility of the future that values innovative technology to better serve its stakeholders through innovation, compliance, and cost effectiveness.

- Innovative technology
- Employee profiles
- Community and professional engagement

INTEGRITY

The Sanitation Districts protect the public health and the environment through its commitment to operational excellence.

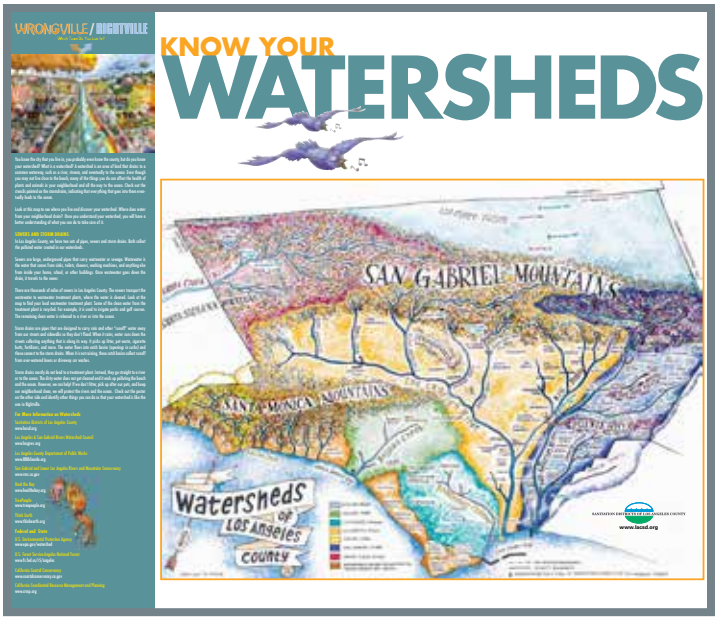
- Water infrastructure
- Recycling, organics diversion
- Renewable energy

SERVICE

Stakeholders play an essential role in sustaining local resources. Collaboration provides transparent communication to our Boards and the public.

- Water conservation
- Non-flushables
- Experiencing local environmental resources (Bixby marshland, tours, schools)

Collaboration makes environmental educational resources available to teachers, students, and community groups. The Sanitation Districts recognizes that well-informed stakehold-



ers are key drivers for sustainable infrastructure practices. The Sanitation Districts sponsor many educational opportunities including marine biology tours and in-class microorganism and water quality science labs.

The plan also engages stakeholders with employees, the service the agency provides to the community, and appropriate investment that funds sustainable environmental infrastructure.

The plan provides collaborative tools that strengthen stakeholders ability to analyze environmental issues through critical thinking, problem solving and decision making elements. The collaboration strategy addresses the complete education continuum from awareness to action and helps realize the fundamental goal of environmental stewardship.

RESULTS

Each month, the team develops an analytics report examining key performance metrics, along with an analysis of the best performers to guide future environmental education development. From 2014 to 2018 the Sanitation Districts went from negative social media (such as rogue sites) to the results summarized below:

Google My Business:

- A total of 3,211,085 views on 28 locations
- Average monthly growth of 300,000 views
- An average of 4,030 actions (call, directions, comments, rate)

Yelp:

- A total of 1,200,023 views on 10 locations
- Average monthly growth of 50,000 views
- An average of 1,050 actions (call, directions, comments, rate)

Facebook:

- A total of 700 followers, with an average monthly growth of 60
- An average of 40 monthly engagements (likes, retweets and mentions)
- An average of 50 clicks to the website each month

Twitter:

- A total of 400 followers, with an average monthly growth of 30
- An average of 20 monthly engagements (likes, retweets and mentions)
- An average of 20 clicks to the website each month lacsd.org
- An average of 62,853 page views
- An average of 18,820 users each month
- An average of 26,000 sessions each month

In additional to these broader metrics, the collaboration strategy proved to be effective at promoting specific campaigns.

Public Service Announcements

Staff has worked with the producers of the PBS show Curiosity Quest to develop public service announcements (PSA).

RATE INCREASE

When it came time to propose rate increases, collaboration implemented a multi-faceted outreach strategy that included detailed website Q&A, public tours demonstrating infrastructure investment, and meetings. Staff developed mailers along with a series of posts emphasizing the importance sustainable infrastructure investment and highlighting the Sanitation Districts mission.

The communication team also spoke to numerous reporters and wrote press releases explaining the increase in the local newspaper. Ultimately, the rate increase passed at the public hearing, held at Sanitation Districts monthly board meeting. This collaborative strategy provides multiple opportunities for stakeholders to learn about regional environmental topics and discover what Sanitation Districts are doing to protect the communities we serve.

CONCLUSION

The Sanitation Districts collaborative strategy has revitalized the agency's community engagement and outreach programs. Traffic to the website is higher than ever before. Engagement metrics demonstrate that stakeholders are reading posts, visiting our website, and interacting to protect regional resources. The Sanitation Districts collaborative strategy keeps pace with rapid changes by working together to produce something new and useful.

Professional Services Directory

Ad Size	1 Time Rate (Color)	4 Time Rate (Color)/issue	4 Time Rate (B&W)/issue	Online/Digital Edition
Double Page Spread	$2,500	$2,000		FREE
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Full Page Inside Cover	$1,500	$1,300		FREE
Full Page	$1,000	$900		FREE
2/3 Page	$725	$700		FREE
1/2 Page	$675	$600		FREE
1/3 Page	$500	$425		FREE
1/4 Page	$400	$350		FREE
Professional Services Directory 1 Height*		$160	$140	FREE
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