The Kappe Lecture Series

2013

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The 2013 Kappe Lecturer

George Tchobanoglous, Ph.D., P.E., NAE

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University of California, Davis

Education

University of the Pacific, 1958, BS, Civil Engineering
University of California, Berkeley, 1960, MS, Sanitary Engineering
Stanford University, 1969, Ph.D., Environmental Engineering

Professional Associations

American Academy of Environmental Engineers
American Society of Civil Engineers
American Water Works Association
Association of Environmental Engineering and Science Professors
Water Environment Federation

Professional Awards and Honors

Elected as a WEF Fellow, 2012
Excellence in Engineering Education Award, AAEE and AEESP, 2012
The Frederick George Pohland Medal, AAEE and AEESP, 2007
Honorary Doctor of Engineering Degree, Colorado School of Mines, 2005
Waste-To-Energy Research and Technology Council Distinguished Service Award for Research and Education in Integrated Waste Management, 2004
National Academy of Engineering, 2004
Athalie Richardson Irvine Clarke Prize, National Water Research Institute, 2003
Jack Edward McKee Medal, Water Environment Federation, 1999
Thomas R. Camp Lecturer, Boston Society of Civil Engineers, 1991
President, Association of Environmental Engineering Professors, 1989

Dr. George Tchobanoglous is a Professor Emeritus in the Department of Civil and Environmental Engineering at the University of California, Davis. For over 35 years, he has taught courses on water and wastewater treatment and solid waste management. His research interests are in the areas of wastewater treatment, wastewater filtration, UV disinfection, aquatic wastewater management systems, wastewater management for small and decentralized wastewater management systems, solid waste management, and water reuse. He has authored or co-authored over 500 technical publications, including 22 textbooks and 8 reference works. The textbooks are used in more than 225 colleges and universities, as well as by practicing engineers. The textbooks have also been used extensively in universities worldwide, both in English and in translation. His textbooks are famous for successfully bridging the gap between academia and the day-to-day world of the engineer. More than 500,000 copies have been sold worldwide. The textbooks have been translated into seven languages including Chinese, Korean, Japanese, Spanish (Spain), Spanish (South American), Italian, Greek, and Farsi (Iranian).

Most recently he, with coauthors, has written extensively on water reuse, including the textbook *Water Reuse: Issues, Technologies, and Applications*, the WateReuse report, *Direct Potable Reuse: A Path Forward*, and the NWRI White Paper, *Direct Potable Reuse: Benefits for Public Water Supplies, Agriculture, the Environment, and Energy Conservation*. He serves as Chair of the NWRI Independent Advisory Panel for the City of San Diego's "Indirect Potable Reuse/Reservoir Augmentation Demonstration Project." He also serves on the NWRI Independent Advisory Panel for the Orange County Water District's Groundwater Replenishment System. He consults nationally and internationally to government agencies and private companies. He is a registered Civil Engineer in California. His hobbies include gardening and photography. He has had four major photographic shows of black and white and color photographs.

Abstracts of Lectures Offered

Wastewater Treatment Trends In The 21st Century

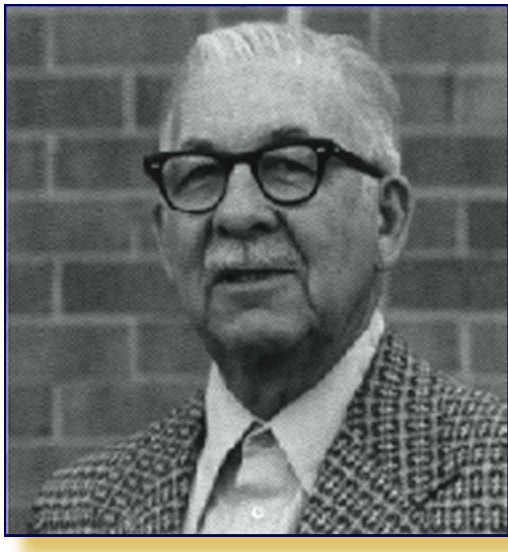
For most of the 20th century, the primary focus of wastewater treatment was on the removal and treatment of settleable and floatable solids, organic matter expressed as biochemical oxygen demand (BOD), total suspended solids (TSS), and pathogenic microorganisms. Late in the 20th century, nutrient removal and odors became issues and controlled, non-potable use of reclaimed water became a common practice in many parts of the world. In the 21st century, a paradigm shift has occurred and wastewater is no longer viewed as a waste requiring disposal, but as a "renewable source of energy, resources, and potable water." In light of this view, it is appropriate to consider some challenges as well as the opportunities that will become increasingly important in the design and implementation of wastewater treatment facilities in the future.

In planning for wastewater treatment plant (WWTP) upgrades or new WWTPs, it is imperative that the incrementalism of the past be replaced with an integrated design process that incorporates energy and resource recovery and purified water production. Using new concepts, technologies, and process configurations, WWTPs can become net exporters of energy and resources. Significant progress toward these objectives will also require consideration of the impact of local and global demographic and environmental events and possible unintended consequences in the implementation of new WWTPs. The benefits and limitations of technology transfer must also be understood and integrated into the design process. All aspects of wastewater management, including source separation, collection, treatment, and reuse must be reexamined. For example, decentralized infrastructure models are now being developed that could make some existing wastewater systems obsolete. Starting the planning process now will allow for early identification of the changes required to both the water and wastewater infrastructure to meet the challenges and opportunities of the future.

Direct Potable Reuse: A Future Imperative

Population growth, urbanization, and climate change, are resulting in stressed public water supplies and development of new water supplies for metropolitan areas is becoming increasingly difficult, if not impossible. As a consequence, existing water supplies must go further. One approach for achieving this objective is by increased water reuse, particularly in supplementing municipal water supplies. Although non-potable water reuse offers many opportunities, the cost associated with the need to provide separate piping and storage systems for reclaimed water is prohibitive and thus, implementation of water reuse programs has been limited. The solution to the problem of distribution and storage cost is to implement direct potable reuse (DPR) of purified water.

Direct potable reuse refers to the introduction of purified municipal wastewater water directly into municipal water supply systems. Purification involves extensive treatment and monitoring to assure that strict water quality requirements are met at all times. The resultant purified water can be blended with raw source water prior to water treatment or blended with potable water for direct pipe-to-pipe reuse. Because DPR will inevitably become part of the water management portfolio, the importance of wastewater and water agencies beginning to develop the necessary information for implementation is great. In planning for wastewater treatment upgrades or new plants that will be used to produce purified water, it is imperative that the incrementalism of the past be replaced with new integrated designs that will produce purified water and achieve the recovery of energy and resources. Technological and implementation issues are examined. The potential application of DPR in Southern California and implications for statewide water management are discussed.



"A man's debt to his profession is to help those that follow."

STANLEY E. KAPPE, P.E., DEE, a successful environmental engineer, believed he owed a debt to the profession that rewarded him so well. During his life, he gave of himself to his university and to his profession through countless hours of volunteer activity. And, through this Lecture Series, he continues to share his good fortune with tomorrow's environmental engineers.

He graduated from Pennsylvania State University in 1930 with a bachelor's degree in sanitary engineering. He served with the Pennsylvania State Health Department and the U.S. Army Corps of Engineers before joining the Chicago Pump Company as its Eastern Regional Manager in 1935. In 1945, he founded Kappe Associates, Inc., a water supply and wastewater equipment company headquartered in Rockville, Maryland, and continued as its Chief Executive Officer until his death in 1986.

His peers recognized his contributions to the profession by numerous awards, including the AWWA Fuller Award, the WPCF Arthur Sidney Bedell Award, the WPCAP Ted Moses and Ted Haseltine Awards, and the AAEE Gordon Maskew Fair Award. In 1985, Pennsylvania State University named him Outstanding Engineer Alumnus.

Stanley E. Kappe was an activist member and leader in several national and Chesapeake region professional societies. He served as the Executive Director of the American Academy of Environmental Engineers from 1971 to 1981.

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