

Assessment of Water Reuse as an Approach for Meeting Future Water Supply Needs

Committee

R. Rhodes Trussell

Chair

Rhodes Trussell (NAE) is the founder of Trussell Technologies, Inc. Previously he was the lead drinking water technologist at Montgomery Watson Harza, Inc. He is recognized worldwide as an authority in methods and criteria for water quality and the development of advanced processes for treating water or wastewater to achieve the highest standards. He has worked on the process design for dozens of treatment plants, ranging from less than 1 to more than 900 mgd in capacity and has experience with virtually every physiochemical process and most biological processes as well. He has a special interest in emerging water quality problems and reuse. Dr. Trussell is a member of the National Academy of Engineering, and has served for more than ten years on EPA's Science Advisory Board. He also served as chair of the Water Science and Technology Board and has been a member of numerous NRC committees, including the Committee on the Evaluation of the Viability of Augmenting Potable Water Supplies with Reclaimed Water and the Committee on Indicators for Waterborne Pathogens. Dr. Trussell, has a B.S., M.S., and Ph.D. in Environmental Engineering from the University of California at Berkeley.

Henry A. Anderson

Member

Henry A. Anderson is chief medical officer and state epidemiologist for occupational and environmental health in the Wisconsin Division of Public Health and adjunct professor of population health at the University of Wisconsin Medical School. Dr. Anderson's expertise includes public health; preventive, environmental, and occupational medicine; respiratory diseases; epidemiology; human health risk assessment; and risk communication. His research interests include disease surveillance, risk assessment, health hazards of Great Lakes sport-fish consumption, arsenic in drinking water, asbestos disease, and occupational fatalities and injuries. He is certified by the American Board of Preventive Medicine with a subspecialty in occupational and environmental medicine and is a fellow of the American College of Epidemiology. Dr. Anderson is chair of the Board of Scientific Councilors of the National Institute for Occupational Safety and Health and serves on the U.S. EPA Children's Health Protection Advisory Committee. He has served on several NRC committees, including the Division on Earth and Life Studies Committee, the Committee on Toxicity Testing and Assessment of Environmental Agents, and the Committee on Enhancing Environmental Health Content in Nursing Practice. Dr. Anderson received his MD from the University of Wisconsin Medical School.

Edmund Archuleta

Member

Edmund Archuleta is the manager of the El Paso Water Utilities Public Service Board, a role he has served in for nearly 20 years. He is responsible for all aspects of water, wastewater, reclaimed water service, and stormwater to the greater El Paso metropolitan area. Mr. Archuleta is a past Chairman of the American Water Works Association Research Foundation, and current Trustee of the Association of Metropolitan Water Agencies. He serves as chairman of the Multi-State Salinity Coalition and in 2006 was appointed by President George W. Bush to the National Infrastructure Advisory Council. He is a registered Professional Engineer. Mr. Archuleta earned his BS and MS degrees in Civil Engineering from New Mexico State University and a Master of Management degree from the University of New Mexico.

James Crook

Member

James Crook is an independent consultant on water and environmental issues. He is an environmental engineer with more than 30 years of experience in state government and consulting engineering arenas, serving public and private sectors in the U.S. and abroad. He has authored more than 100 publications and is an internationally recognized expert in water reclamation and reuse. Previously, he spent 15 years directing the California Department of Health Services' water reuse program and developed California's first comprehensive water reuse criteria. He was the principal author of the Guidelines for Water Reuse, published by the U.S. Environmental Protection Agency and US Agency for International Development. His honors include selection as the American Academy of Environmental Engineers' 2002 Kappe Lecturer. He served as chair of the Committee on the Evaluation of the Viability of Augmenting Potable Water Supplies with Reclaimed Water. Dr. Crook received a B.S. in Civil Engineering from the University of Massachusetts at Amherst, and a M.S. and Ph.D. in Environmental Engineering from the University of Cincinnati.

Jorg E. Drewes

Member

Jorg Drewes is an Associate Professor in the Environmental Science and Engineering Department of the Colorado School of Mines. His research interests include water and wastewater treatment, indirect potable reuse technologies, beneficial reuse of produced water during natural gas exploration, the fate and transport of emerging contaminants in natural and engineered systems, and the rejection of organic micropollutants in high-pressure membranes. Previously, Dr. Drewes served as an Associate Director at the National Center for Sustainable Water Supply at Arizona State University, investigating soil-aquifer treatment for sustainable water. Dr. Drewes has a B.S., M.S., and Ph.D. in Environmental Engineering from the Technical University of Berlin, Germany.

Denise D. Fort

Member

Denise Fort is a member of the faculty at the University of New Mexico's School of Law. She has 25 years of experience in environmental and natural resources law. She served as chair of the Western Water Policy Review Advisory Commission, a presidential commission that prepared a report on western water policy concerns. In earlier positions, she served as director of New Mexico's Environmental Improvement Division, as a staff representative to the National Governors Association, as an environmental attorney, and in other capacities concerned with environmental and natural resource matters. She has served on the Water Science and Technology Board and numerous NRC committees, including the Committee on Sustainable Underground Storage of Recoverable Water. She received her B.A. from St. John's College and her J.D. from the Catholic University of America's School of Law.

Charles N. Haas

Member

Charles Haas is the Betz Chair Professor of Environmental Engineering at Drexel University. His areas of research involve microbial and chemical risk assessment, industrial wastewater treatment, waste recovery, and modeling wastewater disinfection and chemical fate and transport. He was one of the first scientists to examine dose-response data sets for microbial agents spread through environmental means and to implement a quantitative risk framework. Dr. Haas is also the co-Director of the Center for Advancing Microbial Risk Assessment, funded by the Department of Homeland Security and the Environmental Protection Agency. Dr. Haas has been a member of several National Research Council committees, including a committee to define "how clean is safe" following clean up from a bioterrorist event and the Committee on the Evaluation of the Viability of Augmenting Potable Water Supplies with Reclaimed Water. He is also a member of the Water Science and Technology Board. Dr. Haas received his B.S. in Biology and M.S. in Environmental Engineering from Illinois Institute of Technology and his Ph.D. in Environmental Engineering from the University of Illinois.

Brent Haddad

Member

Brent Haddad is the founder and director of the Center for Integrated Water Research and a professor of Environmental Studies at the University of California, Santa Cruz. His research focuses on fresh water policy and management, including urban water management strategies, utility-stakeholder communications (including risk communication and public perception), long-range planning, and he has published research analyzing public responses to water reuse projects. Dr. Haddad serves as a member of the Research Advisory Committee of the WaterReuse Foundation, on the Editorial Board of Environmental Management, and as a consultant for numerous public- and private-sector clients. He received a B.A from Stanford University, an M.A in International Relations from Georgetown University, and an M.B.A in Business and Public Policy and a Ph.D. in Energy and Resources from University of California, Berkeley.

Duane Huggett

Member

Duane Huggett is Assistant Professor in the Department of Biology at the University of North Texas. Previously, Dr. Huggett worked as a research scientist with Pfizer Global Research and Development. Dr. Huggett's research interests include environmental toxicology, bioconcentration and bioaccumulation of contaminants, and ecopharmacology and physiology. Recent research has focused on the bioconcentration and toxicology of select pharmaceuticals in fish. Dr. Huggett received his B.S. in Biological Sciences from Virginia Polytechnic and State University, and he earned his M.S. and Ph.D. in Biological Sciences and Pharmacology and Toxicology, respectively, from the University of Mississippi.

Sunny Jiang

Member

Sunny Jiang is Associate Professor at the University of California at Irvine in the Department of Civil and Environmental Engineering. Her research focuses on water quality microbiology, microbial ecology, and epidemiology of exposure to recreational waters, and she specializes in the application of biotechnology tools for assessment and detection of microbial pathogens in the aquatic environment. She has served on the AWWA Research Foundation Project Advisory Committee and the WHO Desalination Guideline Development Committee. Dr. Jiang received her B.S. in Biochemistry from Nankai University in China, and her M.S. and Ph.D. in Marine Science at the University of South Florida.

David L. Sedlak

Member

David Sedlak is Associate Professor of Civil and Environmental Engineering at the University of California, Berkeley. His areas of research interest include analytical methods for measuring organic compounds in water, fate of chemical contaminants in water recycling systems, metal speciation, and its effect on metal uptake and reaction, environmental photochemistry, and ecological engineering. He has received several notable awards including the Paul Busch Award for Innovation in Water Quality Engineering in 2003, the NSF CAREER Award in 1997, and the Hellman Family Faculty Award in 1996. Dr. Sedlak received a B.S. degree in Environmental Science from Cornell University and a Ph.D. degree in Water Chemistry from the University of Wisconsin in Madison.

Shane Snyder

Member

Shane Snyder is the Research and Development Project Manager at the Southern Nevada Water Authority in Las Vegas, Nevada. He also serves as an associate adjunct professor in the chemistry department at the University of Nevada, Las Vegas. Much of his research has focused on the trace-level detection, removal, and toxicology of emerging contaminants, such as endocrine disrupting compounds, perchlorate, and pharmaceuticals. He serves as the Chair of the American Water Works Association's Organic Contaminant Research Committee and as the vice-chair of the Source Water Protection Committee. He received a bachelor's degree in chemistry from Thiel College in Pennsylvania and a dual Ph.D. in Environmental Toxicology and Zoology from Michigan State University.

Margaret H. Whittaker

Member

Margaret H. Whittaker is the Chief Toxicologist and President of ToxServices, where she serves as the project manager and technical lead of ToxServices projects. In addition to her extensive program management experience, Dr. Whittaker has extensive technical experience in hazard identification and non-cancer and cancer dose-response assessment, including quantitative risk assessment (e.g., benchmark dose modeling for both carcinogens and non-carcinogens). She has worked at two of the country's leading toxicology and risk assessment consulting firms (The ENVIRON Corporation and The Weinberg Group). Dr. Whittaker has over a decade of experience evaluating health hazards and quantitating human health risks for low-level contaminants in drinking water, pharmaceuticals, medical devices, cosmetics, and food additives. She is a Diplomat of the American Board of Toxicology (D.A.B.T.). Dr. Whittaker earned a Ph.D. in Toxicology from the University of Maryland, Baltimore and an M.P.H. in Environmental Health from the University of Michigan.

Dale Whittington

Member

Dale Whittington is Professor of Environmental Sciences & Engineering, City & Regional Planning, and Public Policy, at the University of North Carolina at Chapel Hill. Since 1986 he has worked for the World Bank and other international agencies on the development and application of techniques for estimating the economic value of environmental resources in developing countries, with a particular focus on water and sanitation and vaccine policy issues. Dr. Whittington has published extensively on cost-benefit analysis, environmental economics, and water resources planning and policy in developing countries. His current research interests include the development of planning approaches and methods for the design of improved water and sanitation systems for the rapidly growing cities of Asia. Dr. Whittington received his A.B. at Brown University, his MPA at the University of Texas, his M.Sc. at the London School of Economics and Political Science, and his Ph.D. at the University of Texas.