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Geoenvironmental Engineering: Honoring David E. Daniel

EDITED BY Craig H. Benson, Ph.D., P.E.;
and Charles D. Shackelford, Ph.D., P.E.

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HONORING DAVID E. DANIEL

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Preface

These proceedings are dedicated to David E. Daniel in recognition of his contributions to the field of geoenvironmental engineering. The proceedings are also an expression of gratitude for the friendship, mentoring, and collegiality he has shared with the authors in these proceedings over the last 35 yr. His focus on excellence, dedication to service, and unwavering emphasis on integrity have had a profound influence on each of the authors in this proceedings.

Daniel is a founding father of the professional discipline now known as geoenvironmental engineering, which originated in the late 1970s in response to high demand for knowledge regarding environmental processes that affect the fate and transport of contaminants in the subsurface. In 2000, Daniel was elected to the National Academy of Engineering, the most prestigious honor recognizing engineering achievement in the United States, for his leadership in developing the field of geoenvironmental engineering and his major contributions to engineering practice regarding waste containment systems.

Most of Daniel's professional work in geoenvironmental engineering has focused on engineered barriers for waste containment systems. His seminal contributions underpin our knowledge of the engineering behavior of clay barrier materials and have directly influenced how clay barriers are designed and deployed in practice. Examples of his contributions include the importance of scale effects when interpreting data regarding the performance of engineered soil barriers, development of laboratory and field methods for measuring the hydraulic conductivity of engineered barrier materials, development of modern performance-based compaction criteria for compacted clay barriers, and the role of chemical transport in engineered barrier design, including the potential effects of chemical incompatibility on barrier performance. Daniel's seminal contributions on engineering behavior of geosynthetic clay liners led to their widespread adoption in engineering practice.

The papers in this proceedings reflect the impact of Daniel's contributions to geoenvironmental engineering. The papers describe case histories of engineered barriers for containment systems as well as fundamental studies on laboratory methods to measure hydraulic conductivity, chemical transport through vertical barriers with enhanced attenuation capacity, and the fundamental behavior of active clays used for engineered barriers.

Daniel is a staunch advocate of peer review and excellence in engineering research and practice. Consistent with this philosophy, each of the papers in these proceedings was deemed acceptable for publication only after an affirmative review by two anonymous reviewers, in accordance with the policy of the American Society of Civil

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Engineers. The editors consider the papers in these proceedings to be of the highest quality, and believe they will advance the science and practice of geoenvironmental engineering.

Craig H. Benson and Charles D. Shackelford, 2016

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Biography

David E. Daniel earned bachelor's, master's and Ph.D. degrees in engineering from the University of Texas at Austin. Between degrees, he worked for three years as an engineer in the San Francisco Bay Area. He served on the faculty at University of Texas at Austin from 1980 to 1996. In 1996, Daniel moved to the University of Illinois at Urbana-Champaign to serve as Head of the Department of Civil and Environmental Engineering. He served in that role until he was appointed Dean of Engineering in 2001. Daniel was appointed President of the University of Texas at Dallas in 2005 and served in that role until 2015. He was appointed Deputy Chancellor of the University of Texas System in July 2015. In these roles, Daniel has advocated widely for developing and cultivating world-class research universities. The approach that he suggested for creating more top-tier research universities in Texas led to major legislation fostering the development of research universities in Texas.

Daniel is considered a founding father of geoenvironmental engineering, an interdisciplinary professional domain at the nexus of geotechnical, geological, and environmental engineering. His seminal work on clay barrier systems for waste containment systems has been integrated into geoenvironmental engineering practice worldwide. In 2000, he was elected to the National Academy of Engineering, the most prestigious honor recognizing engineering achievement in the United States, for his leadership in developing the field of geoenvironmental engineering and his major contributions to engineering practice involving waste containment systems.

Daniel has also served the engineering profession more broadly. From 2005 through 2008, Daniel served as Chair of the American Society of Civil Engineers' (ASCE) External Review Panel that examined the facts surrounding the performance of New Orleans' levees during Hurricane Katrina. In 2009 Daniel served as President of The Academy of Medicine, Engineering, and Science of Texas (TAMEST), which comprises all Texas residents who have won Nobel Prizes or been elected to one of the National Academies. In July 2010, Daniel was appointed by the National Academy of Engineering to a committee investigating the Deepwater Horizon explosion and oil spill in the Gulf of Mexico. He currently serves on the governing Council of the National Academy of Engineering.

Daniel's professional work has been recognized with the highest honors by ASCE, which awarded him the Norman Medal (ASCE's highest honor for a publication) and on two separate occasions the Croes Medal (ASCE's second highest honor for a publication). He has also received the Presidents' Award and the Outstanding Projects and Leaders Award (OPAL) for Education from ASCE, as well as the Geotechnical Hero's Award from the Geo-Institute.

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David E. Daniel, Ph.D., P.E., NAE

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