ENVIRONMENTAL/ENGINEERING GEOLOGY DINNER MEETING— OCTOBER 24, 1989

CHRISTOPHER C. MATHEWSON—
Biographical Sketch

Christopher C. Mathewson is Professor of Geology, specializing in engineering geology, and director of the Center for Engineering Geosciences at Texas A&M University. Dr. Mathewson received a Bachelor of Science degree in Civil Engineering from Case Institute of Technology in Cleveland, Ohio, in 1963, and his Master of Science and Doctoral degrees in Geological Engineering from the University of Arizona in 1965 and 1971 respectively. He served as a commissioned officer in the National Ocean Survey from 1965 to 1970, working on ocean charting and marine geophysical surveys in the Pacific and coastal hazards in Hawaii. Dr. Mathewson joined the faculty at Texas A&M in 1971. At Texas A&M, he has conducted research on coastal and river processes, expansive soils mechanisms, urban planning, natural hazard analyses and mitigation, archaeological site preservation and the engineering geology of surface lignite mines. Dr. Mathewson has presented over 175 papers, published over 55 technical papers and is the author of a textbook in Engineering Geology.

Dr. Mathewson is currently the president of the Association of Engineering Geologists. He has served as editor of the *Bulletin of the Association of Engineering Geologists*, and student member coordinator of the Association of Engineering Geologists. He is also chairman of the Engineering Geology Division of the Geological Society of America. Dr. Mathewson received the Claire P. Holdredge Award from the Association of Engineering Geologists in 1981 and the Faculty Distinguished Achievement Award in Teaching from the Former Students Association of Texas A&M in 1986.

HYDRODYNAMICS OF KNICKPOINT EROSION

Headward erosion of knickpoints in stream channels and spillways represents a risk to the safety of dams and other riverine structures. Knickpoint erosion is often initiated at a geometric anomaly in the channel profile, be it man-made or natural. Rock strength properties, stratigraphic relationships and structure are all controlling geological factors in the phenomena of knickpoint erosion. Hydrodynamic factors are controlled by the relationship between the depth of water and height of fall and whether the flow system is vented or not. At high flow volumes compared to the height of the fall, the knickpoint acts as a minor irregularity on the channel floor and retreat is minimized. However, at low flows, unvented conditions can develop over the knickpoint and significant amounts of erosion and headward cutting are possible. A knowledge of the phenomena of knickpoint erosion is critical to the safe design and operation of riverine structures.