ENVIRONMENTAL/ENGINEERING GEOLOGISTS

ENVIRONMENTAL COMMITTEE DINNER MEETING—FEBRUARY 22, 1989

WILLIAM F. MULLICAN, III—Biographical Sketch

William F. Mullican, III is currently a Research Scientist Associate at the Bureau of Economic Geology at The University of Texas at Austin. Mullican has been with the Bureau since 1983. Before moving to Austin, Mullican worked as an exploration geologist for Tenneco Oil Company in its Texas Gulf Coast Division in Houston. He received his B.S. (1978) in broad field science education and M.S. (1981) in geology, both from Texas Tech University.

Mullican's research interests have focused on the geologic and hydrologic processes that may affect the suitability of a region or site for waste disposal. His efforts have included a two-year study on the feasibility of using solution-mined caverns in salt domes as permanent repositories for the disposal of toxic-chemical waste. During this period his research concentrated on subsidence and collapse over salt domes and the potential impact these processes may have on a storage facility. The results of this work were published by the Bureau as Geological Circular 88-2, "Subsidence and Collapse at Texas Salt Domes." Currently Mullican's research time is spent on site characterization of the proposed Texas low-level radioactive waste disposal facility located 50 miles southeast of El Paso.

SUBSIDENCE AND COLLAPSE AT BOLING SALT DOME — THE RESULTS OF MULTIPLE RESOURCE RECOVERY AND POTENTIAL IMPACT ON TOXIC WASTE DISPOSAL

Subsidence and collapse at several salt domes in Texas have been investigate to determine the causes and potential impact such processes may have on the suitability of a dome for use as a site for toxic waste disposal. Boling salt dome, located in Wharton and Fort Bend Counties, was of particular interest during these investigations because of several factors: extensive recovery of multiple resources including sulfur, oil, gas, salt, and ground water, extensive areas of subsidence and collapse resulting from the removal of these resources, and its consideration as a candidate for a toxic waste disposal facility.

Boling Dome has undergone more subsidence and collapse than any other salt dome in Texas. The greatest vertical movement is 35 feet (based on the Boling 7.5-minute topographic map, last surveyed in 1953). Most of the subsidence (83%) can be attributed to sulfur production, and a minor amount (11-12%) can be attributed to oil and gas production. The remaining volume (5-12%) may be attributed to groundwater production, original porosity, subsidence yet to reach the surface, or error in measurement. Both reservoir compaction, resulting from hydrocarbon production, and trough subsidence, collapse, and piping resulting from sulfur production are present over the crest of Boling Dome. The structural and hydrologic stability of the surface and subsurface at Boling Dome is compromised by these active deformation processes. Research such as that conducted at Boling Dome emphasizes the importance of considering the potential for subsidence and collapse before selecting a site for toxic waste disposal. The potential for subsidence and collapse should be a primary consideration in the selection of sites for the disposal of toxic waste in solution-mined caverns in salt domes.