
PERMIAN BASIN/MID-CONTINENT EXPLORATIONISTS

Permian Basin and Mid-Continent Exploration Meeting Thursday, January 15, 1991 6:00 p.m. - Westin Oaks

The January dinner meeting of the Houston Geological Society Permian Basin and Mid-Continent group will feature an A. E. Levorsen Award paper by Mr. J. Reed Lyday. A directory of the committee members and attendees of the 1990 meetings will be available. Membership applications will be available for attendees wishing to join HGS and interest survey forms will also be available for those who would like some input toward the content of future meetings or to work with this committee.

Our dinner speaker, Mr. J. Reed Lyday, will present his 1985 A. I. Levorsen Award paper; "Berlin Field: Genesis of a Recycled Detrital Dolomite Reservoir, Deep Anadarko Basin, Oklahoma."

Reservations must be made by Friday, January 11, 1991, by calling Margaret at Houston Geological Society (785-6402) before 4:00 p.m. Dinner is \$20 for HGS members and \$22.00 for nonmembers, no-shows will be billed.

BERLIN FIELD: GENESIS OF A RECYCLED DETRITAL DOLOMITE RESERVOIR, DEEP ANADARKO BASIN, OKLAHOMA

The Berlin Gas Field in Beckham County, Oklahoma, was discovered in 1977 and is the largest Atoka (Pennsylvanian) hydrocarbon accumulation in the Anadarko Basin. It is an overpressured reservoir 15,000 feet deep and occupies a surface area of 41 square miles. The reservoir rock consists primarily of recycled, detrital Arbuckle Dolomite (Cambrian-Ordovician), and contains ultimate recoverable reserves of 362 BCF.

Arbuckle Dolomite and limited exposures of Precambrian granite rocks were eroded from the Amarillo-Wichita mountains during the Atokan Age and were deposited as a terrigenous, sandy dolomite clastic wedge adjacent to the uplift. During late Atokan deformation, the Elk City structure was uplifted and subaerially exposed in the vicinity of the limit of the dolomite clastic wedge. The detrital dolomite on the structure was concurrently eroded and recycled basinward as a shallow marine fan delta. Recrystallization during burial diagenesis destroyed the detrital depositional texture and created the present intercrystalline porosity.

The deep Elk City structure consists of an upthrust block bounded by the late Atokan unconformity which is genetically associated with the Berlin fan delta. The present relief on the upthrust block and overlying anticlinal folds was formed during post-Atokan growth of the structure. The Elk City field contains roughly 1 TCF ultimate recoverable

reserves in Springer, Morrow, Atoka and Des Moines strata.

The genetic relationship between the Berlin Field and Elk City crestal unconformity is an example of the possible association of crestal unconformities and clastic stratigraphic traps. Such stratigraphic traps originate in marine environments proximal to active structures that have become subaerially exposed. With adequate seals and favorable structural position, detrital deposits recycled from local uplifts can form significant stratigraphic traps which can occur in compressional, and diapiric regions.