

**AAPG Annual Meeting  
March 10-13, 2002  
Houston, Texas**

C. N. Denison<sup>1</sup>, R. C. Preece<sup>2</sup>, . Pujiarko<sup>3</sup> (1) Chevron Petroleum Technology Company, San Ramon, CA (2) Chevron Petroleum Technology Company, San Ramon, CA (3) Caltex Pacific Indonesia, Duri, Indonesia

## **Tidal Flats v. Marine Shales: Biotic Signals Applied to Sequence Stratigraphy in the Central Sumatra Basin, Indonesia**

Major reservoir sandstones in the Sihapas Group of the Central Sumatra Basin include the Menggala, Bangko and Bekasap formations (Early Miocene). A siltstone-dominated progradational deltaic complex is dissected by a succession of lowstand valley incisions, each valley having a subsequent sand-rich fill of transgressive tidal and estuarine facies

Each sequence boundary (SB) is represented by a tidal channel sandstone on shelf shale contact. Tidal / estuarine channel sandstones on tidal flat shale contacts are generated by autocyclic processes during incised valley fill (IVF) aggradation. Each incised valley is capped by a floodback surface (FS), resulting in a marine shale on estuarine sandstone contact. Foraminiferal assemblages provide crucial data that constrains depositional environments of the shales: marine shelf shales yield an open marine microfauna, whereas tidal flat shales are frequently depauperate.

Subsurface correlations depend on identification of the isochronous FS and the overlying through-going marine shales. Sand-on-shale contacts are candidate sequence boundaries and shale-on-sand contacts are potential floodback surfaces. In many cases, neither lithologies nor ichnofaunas may provide conclusive evidence. A marine or tidal biotic signal from the foraminiferal content of shales limits the possibilities.

Final confirmation of the field-wide presence of each candidate SB and FS, and the more localized occurrence of lesser surfaces, depends upon wireline log correlation. The ensuing sequence stratigraphic interpretation and earth model lead to improved understanding of flow unit distribution and ultimately to better reservoir characterization.