

## **Controlling Factor in Pliocene Carbonate Reservoir Quality as Key to Evaluate Play Chances: Case study from Mundu Carbonate from South Madura Strait - East Java Basin**

**Maradona Mansyur<sup>1</sup>, Nurhasan<sup>1</sup>, and Lawrence Grant Wooley<sup>1</sup>**

<sup>1</sup>Santos Ltd Indonesia

### **ABSTRACT**

The Mundu carbonate from East Java Basin is a prolific oil and gas exploration target. These carbonate reservoirs consist of more than 85 % foraminifera bioclast, worth total 3.5 TCFG from total 18 discoveries. The appearance of Mundu reservoirs is unusual across offshore east Java due to the total porosities which averagely above 40% and could associate with very excellent permeability. However, factors controlling the reservoir properties remains debatable.

To better understand the diagenetic history and surficial process responsible to the quality of Mundu reservoir, a comprehensive study using more than 1008 core plug data along with sedimentology descriptions, XRD, SEM and petrography analysis had been conducted. The study resulted in (i) six distinct facies of Mundu reservoir that is strongly associated with sortation process(ii) reservoir quality strongly controlled by the amount of clay content in reservoir matrices (iii) product of diagenesis are minor and usually follows stratabound geometry.

Interpretation of Mundu carbonate depositional environment is supported by; the appearances of pervasive burrows associated with shallow marine sedimentary structures, unique appearances of pollen taxa and the absence of radiolarians assemblage. The overall natural characteristic of Mundu reservoirs in East Java Basin is distinctive when compared to the other Oligo-Miocene carbonates elsewhere in the region which usually associated with quality enhancement by meteoric to transition marine karstification process.