

Very Thick Massive Sandstone Bodies: Origin and Internal Architecture

Arcuri, Mariano¹, Carlos Zavala² (1) IADO-CONICET; Universidad Nacional del Sur, Bahía Blanca, Argentina (2) IADO-CONICET; Universidad Nacional del Sur, Bahía Blanca, Argentina

Very thick massive sandstones bodies constitute new exploratory targets mainly in offshore mini basins. Although these bodies are relatively well known from subsurface studies, there are very few detailed field descriptions. This contribution focuses on the exhaustive description and analysis of very thick massive sandstone bodies from core and field examples from different Jurassic to Tertiary marine basins of Argentina. The examples provided here are composed of nearly homogeneous fine to medium grained sandstones bodies up to 45 meters thick. These packages develop over a sharp or slightly erosive base and they commonly lack internal bioturbation, mud deposition levels or other evidences of pauses in sedimentation. Very thick massive sandstones were usually related to an “in mass” deposition induced by a gravitational collapse associated with surge-like flows having high suspended load. However, more recent studies have proposed an origin related to the progressive aggradation from long-lived and quasi-steady turbulent flows. Massive deposits could be related to the absence of a sharp surface between the flow and the deposit. In the examples here discussed these massive strata appear to be associated with confined areas related to contemporaneous basin topography. Field examples show that these sandstone packages compose elongate bodies of 0.8 - 15 kms length and 0.5 - 3 kms width. Internally discontinuous erosional surfaces with aligned clay clasts are common, and they suggest a lateral anisotropy in flow energy. Detailed correlation patterns also suggest that very thick sandstone bodies could have a convex-upward top. Reservoir properties of these bodies are deeply controlled by burial and diagenetic history. Deep burial (> 3,000 meters) often result in tight sands.