Glacial-Related Sandstones of the Gondwanan Itararé Group (C-P), and the Barra Bonita Gas Field, Paraná Basin, Brazil

França, Almério Barros[1] (1) Petróleo Brasileiro - PETROBRAS, Rio de Janeiro, Brazil

Diamictites and sandstones compose the Itararé Group (C-P), deposited in 36 million years. It is present throughout the Paraná basin, covering about 1,000,000 km2 with a maximum thickness around 1200m. The diamictites were deposited mostly by rain out processes with subsequent slumping down into the basin. Incised valleys as wide as 4km are commonly mapped in seismic and outcrops. The incised valleys are commonly filled up with sandstones deposited by high-density gravity flows and are the best reservoirs of the Carboniferous-Permian in the Gondwana of the Paraná basin. The Barra Bonita gas field is an example of accumulation in such channelized sandstones.

The Paraná basin has 120 wells drilled for oil exploration and 600 meters of cores in the Itararé Group, alone. The outcrop area, however, provides the best information to understanding the geometry and reservoir distribution in the Itararé Group. The Barra Bonita was discovered based on a geological model created in an outcrop area, where a channelized sandstone crops out for about 65km, is about 2km wide, and average 100m thick. The best reservoir facies are amalgamated massive sandstones up to 10m thick, porosity ranging from 10 to 20% in outcrops and 8 to 15%, as deep as 4000m, due to secondary porosity.

The importance of the incised valley is twofold, for it contains the main reservoirs and, most important of all, they cut deep to the Devonian black shales putting in contact source rocks and reservoirs.