

The Neuquén Basin of west-central Argentina: an exceptional Andean setting in Mesozoic times

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The Andean system along the western margin of Gondwana records the development of a complex series of fore-arc, intra-arc, and retro-arc basins of distinctive evolution during the Mesozoic (Ramos and Alemán, 2000). In the central and southern part of South America (18°S-55°S) several basins record mostly marine sedimentation where the outcrops form a narrow belt along the Andes in the north, covering part of the Chilean and Argentine Cordillera, and extending eastward in the central area to form the Neuquén Embayment. The exceptional characteristics of this eastward expansion are the result of an orthogonal rift system to the continental margin developed during Triassic-Early Jurassic times (Franzese and Spalletti, 2001). This rift system was developed along the hanging-wall suture of the proposed collision between Patagonia and Gondwana (Ramos et al., 2018). This retro-arc basin contains latest Triassic to Early Cretaceous marine and continental sequences, several thousand meters thick that cover more than 100,000 square kilometers with an eastward unique extension of more than 500 km from the Pacific continental margin. The deposits accumulated under a variety of conditions, mostly as a result of important marine transgressions from the Pacific Ocean to the west across the magmatic arc driven by sea-level variations and/or local tectonics (Legarreta and Uliana, 1991). Among these sedimentary successions, it is worthy to remark the development of important source rocks that are presently examined for their significance as unconventional reservoirs. These rocks are represented by the Los Molles Formation (up to 2,000 m of dark shales; fine sandstones and tuffs; Pliensbachian-early Callovian), the Vaca Muerta Formation (up to 1,250 m of dark shales, fine limestones and tuffs; early Tithonian-early Valanginian) and the Agrio Formation (up to 1,500 m of shales, silty shales, bioclastic carbonates and tuffs; early Valanginian-late Hauterivian). Modern works including detailed sedimentologic, cyclostratigraphic, geochemical and biostratigraphic studies as well as high-resolution geochronology are the basis for intense exploration and development activities. Franzese, J.R. and Spalletti, L.A. 2001. Late Triassic continental extension in southwestern Gondwana: tectonic segmentation and pre-break-up rifting. *Journal of South American Earth Sciences* 14: 257-270.

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