



## The Tectonic Evolution of the Pachitea Sub Basin, Peru, and Implications for the Petroleum System

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### Abstract

The Pachitea sub-basin is located in the south-western part of the Ucayali Basin in southern Peru. The Pachitea sub-basin is bounded by the Eastern Cordillera to the west and by the Shira High to the east. In the southwestern part of the sub-basin the San Matias Thrust is located outboard of the main bounding fault system of the Eastern Cordillera and creates the San Matias Range which loses elevation to the north as displacement on the San Matias Thrust dies out.

The San Matias Thrust detaches in an evaporitic sequence of Permo-Triassic age and carries in the hangingwall a thick sequence of Mesozoic sediments between the base Cretaceous unconformity and the Permo-Triassic evaporites. These sediments do not appear to be present to the east of the San Matias Thrust. Beneath the top of the evaporites are a series of basement involved extensional faults, some of which are inverted, that controlled the deposition of the evaporites. Apart from a thin package that rapidly pinches out there are no evaporites present east of a major extensional fault system located beneath the footwall ramp of the San Matias Thrust sheet. There is therefore a clear spatial relationship between the distribution of the Permo-Triassic evaporites, the sequences immediately above them and the fault system that appears to control their eastern limits.

The purpose of this investigation was to develop an integrated model of basin development and the later compressional deformation in order to constrain future models of the petroleum system. In this paper we discuss the 3-dimensional structure of the San Matias Thrust which shows a distinctive displacement gradient from south to north and also contains an oblique subsidiary thrust in the hangingwall of the San Matias Thrust. We also describe a model for the deposition of the Mesozoic sediments beneath the base Cretaceous unconformity sequences due to withdrawal of the Permo-Triassic evaporites from their extensional fault controlled depositional basin which created the accommodation space for these sediments. We also discuss the extensional fault systems in the Triassic and older sediments and their control on the deposition of the evaporites, the timing and distribution of inversion of these faults and the implications for the hydrocarbon system in the basin.