

REGIONAL STRUCTURAL STYLES IN THE SANTIAGO AND MARAÑÓN BASINS OF NORTHERN PERU: NEW IMPLICATIONS FOR HYDROCARBON TRAPPING FROM INTERPLAY OF THICK-SKIN, THIN-SKIN and SALT TECTONICS

Witte, J.*, Lemieux*, S. and B. Veilleux*

* Talisman Energy INC., Suite 2000, 888 – 3RD ST., S.W. Calgary, Canada

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As part of ongoing petroleum exploration work, regional true-scale structural cross-section analysis was carried out in a SW-NE trending corridor spanning 500km by 100km in the northern part of the Marañón Basin and adjoining Santiago Basin, northern Peru. The section construction was based on integration of old vintage 2D seismic data, petroleum exploration wells, surface geological data, digital elevation models, recent seismicity and stress data as well as formerly published structural models. Particular attention in our analysis was given to the interplay of the observed structural styles, trap geometries and timing constraints of structures. The analysis reveals numerous structural styles with significant variations along the interpreted corridor. We present new interpretations on the control of deeper-rooted thick-skin tectonics on the location and geometries of salt- and thin-skin structures in both basins. More detailed interpretations of the Paleozoic section in the deeper Marañón Basin reveal complex geometries in these strata and improved understanding of fault angles and detachment levels.

In the Santiago Basin particular attention was given to the timing and mechanisms of salt tectonics and its overprinting by Tertiary Andean compression and the related trapping potential. We propose new interpretations of structural styles in the Santiago Basin and suggest a different sense of fault-movements (more contractional than transpressional), and therefore, challenge former interpretations published by Tankard et al. (2002). Furthermore, we shed new light on the interplay of thick- and thin-skin tectonics, their timing and effects on trapping mechanisms in both basins. We make the attempt to regionally constrain the timing of the structures along the interpreted corridor in order to better understand the implications on regional hydrocarbon migration, hydrocarbon kitchen shut-off and trap charge during a sequence of extensional and compressional kinematic stages.