# Tertiary Oil-Prone Coals and Carbonaceous Shales Identified as the Potential Source Rock of the Caracara Sur Oil Field in the Llanos Basin, Colombia

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## Abstract

The Caracara Sur oil field is located in the Llanos Basin, one of the largest and most prolific sedimentary regions of Colombia. The field produces 21°API oil from the Carbonera C7 formation of Paleogene age, located at a depth ranging from 4,500 to 5,500 ft below ground level. The reservoir consists of multilayered and compartmentalized sandstone packages, intercalated with shales and thin beds (1 to 5 ft) of high volatile bituminous coals and carbonaceous shales deposited in a deltaic environment.

The Carbonera C7 section (Paleogene age) exhibits excellent source rock potential, showing vitrinite reflectance values ($R_o$ < 0.55%) and $T_{max}$ (< 435ºC) below the conventional threshold for oil generation. Multicomponent kinetic analyses in Carbonera C7 samples indicates oil generation onset at 80°C, close to the present day temperature in the Caracara Sur field (65-75°C). It is suggested that the oils are early generated from a low-activation kerogen in a nearby region where the Carbonera C7 is found deeper and more mature, probably some 10-50 km westwards.