
Petrography of stratigraphic units in the subsurface in the Phetchabun Basin, Thailand

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The Phetchabun Basin is one of at least 30 Tertiary intermontane basins in Thailand formed by regional crustal extension localized by strike-slip faults. Most oil production in Southeast Asia is from these Tertiary basins, and they are primary targets for hydrocarbon exploration. Basins in Thailand contain thick lacustrine strata, in places including coal, lignite and oil shale. This study focuses on the Wichian Buri subbasin, one of the five grabens that comprise the Phetchabun Basin. This subbasin is unusual due to the fractured igneous intrusions that apparently form hydrocarbon reservoirs. The stratigraphic units of the Phetchabun Basin have been defined by earlier workers and include an upper unit of Pliocene-Pleistocene sediments, underlain by the Miocene Chaliang Lab Formation and Wichian Buri Group, and the Oligocene “basal Tertiary”, which unconformably overlies Mesozoic volcanic and granitoid rocks. The Chaliang Lab Formation consists of claystone with minor sandstone and lignite. The underlying Wichian Buri Group is divided into 4 units: unit 1 has been previously described as reworked basaltic tuff and interbedded coarsening-upward sandstone units. Units 2, 3, and 4 contain basaltic flows and gabbroic sills interlayered with claystone, sandstone, and siltstone. The basal Tertiary is described as claystone with minor interbedded sandstone and altered fine-grained basaltic flows or sills. This project is petrographic study of a suite of thin sections from 150 cuttings samples from 15 drill holes in the Wichian Buri subbasin. The samples are from units 1, 2, 3, and 4 of the Wichian Buri Group and were initially logged as tuffaceous. However, low magnetic susceptibility measurements and preliminary petrographic observations indicate that they are sedimentary and in some cases metasedimentary where contact metamorphosed by gabbroic sills. The data obtained in this study will enable comparison between stratigraphic units and also give some information about how the units vary across the area by providing data from drill holes located across a distance of 8 km from south to north across the basin.