
**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 Cenozoic intermontane basins in Thailand formed by regional crustal extension localized by strike-slip faults. Most oil production in Southeast Asia is from these basins, and they are primary targets for hydrocarbon exploration. The basins contain thick lacustrine strata, in places including coal, lignite, and oil shale. This study focuses on the Wichian Buri subbasin, one of five grabens that comprise the Phetchabun basin in central Thailand. This subbasin is unusual due to the presence of fractured igneous intrusions that 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 Oligocene “basal Tertiary”, which unconformably overlies Mesozoic volcanic and granitoid rocks. The Chaliang Lab Formation consists of claystone with minor sandstone and lignite. The Wichian Buri Group is divided into 4 units. Unit 1 has been described previously as

reworked basaltic tuff interbedded with coarsening-upward sandstone. Underlying units 2, 3, and 4 contain basaltic flows and gabbroic sills interlayered with or intruded into claystone, sandstone, and siltstone. The basal Tertiary has been described as claystone with minor interbedded sandstone and altered fine-grained basaltic flows or sills. A petrographic study of thin sections made from 150 cuttings samples from units 1 through 4 of the Wichian Buri Group from 15 drill holes in the Wichian Buri subbasin is being done to provide additional information about these units. Preliminary observations indicate that the samples are dominated by 7 different type of grains: (1) inter-layered lithic (quartz, feldspar and other grains) sandstone and siltstone with bitumen and high porosity; (2) lithic sandstone composed of quartz, feldspar, and other grains with bitumen and high porosity; (3) dark grains of lithic arenite and siltstone with high organic content that might represent a hydrocarbon source; (4) igneous fragments including basalt and gabbro; (5) siltstone with bitumen and moderate to low porosity; (6) spotted hornfels formed by contact metamorphism of siltstone and sandstone clasts; and (7) bitumen grains. These observations are being correlated with location in the stratigraphic column to provide information about how the Wichian Buri Group varies across the area.