

Discovered five groundwater aquifers in the lower Chao Praya basin.

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Samut Sakhon is a significant economic province in Thailand more than 6,000 factories were located and this province is the sixth-largest gross domestic product (GDP) in the country. Samut Sakhon is in a north-southerly trending Tertiary basin "Thonburi basin", which is a part of Thailand's lower Central Plain where Quaternary sediments have proven thicknesses in the range of 300 m. to 2,000 m. which accumulated during the greatest extension-related deposition and thermal subsidence.

The total water demand in this province is estimated at over 385 million m³/year while the water supply has only provided approximately 290 million m³/yr which indicates a water deficit of almost 100 million m³/yr. Groundwater aquifers between depths of 200 m. and 400 m. are used as the major water supply in this province, which has been developed for 41 million m³/year or approximately 100,000 m³/day.

From 2020 to recent, the Department of Groundwater Resources (DGR) initiated the groundwater investigation projects in deeper aquifers of the main groundwater basins in Thailand. This study is the first to apply new drilling techniques such as the aquifer packer test, internal cement grouting and natural-packed well to drilling proceeds into deeper aquifers (deeper than 600 m.) in the lower Chao Praya basin, which this well was drilled until the depth 1,008 meters below the surface (mbs).

The results show significant differences in both lithological and geophysical well logging data from the depth below 640-1,008 m. consisting of fining-upward sequences of variable thickness and layers of sediments deposited. Interestingly, there are five different layers have been identified as the new aquifers of the lower Chao Praya basin those aquifers consist of a large number of groundwater reservoirs and contain good groundwater quality. The five new aquifers underlie a notably thick clay layer (depth interval 500 to 640 mbs.) which is used as an indicator of distinctly differentiating five new aquifers from the other eight published aquifers (descending order from geologically youngest to oldest; Bangkok aquifer, Phra Pradeang aquifer, Nakorn Luang aquifer, Nonthaburi aquifer, Samkhok aquifer, Phayathai aquifer, Thonburi aquifer and Pak Nam aquifer). The depth intervals of five new aquifers are 640-705 mbs., 715-785 mbs., 810-880 mbs., 895-935 mbs., and 950-1,008 mbs.

The discovery of five new aquifers from this study will be produced more groundwater quantity to the water supply system of local authorities and will be permitting long-term economic growth and social support activities for 22,000 people or approximately 10,000 families.

Keywords; Discovered, sequence of sediments deposited, new aquifers, Thonburi Basin.