

# The Application of Geophysical Survey for Shallow Groundwater in Triassic weathered Meta-Sedimentary Aquifers at Sra Kaew College of Agriculture and Technology

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## Abstract

This study aims to apply geophysical survey for exploring shallow groundwater in weathered meta-sedimentary aquifers. This activity supports the community-based water management projects under the Royal Initiative of the Deputy Minister of Education, Dr. Kalaya Sophonpanich, in the Sakaeo College of Agriculture and Technology (SCAT). The reason to conduct this activity is in the surrounding area of SCAT, because of they face the problem of water shortages in their agricultural activities. As a result, two large water reservoirs have been excavated within the college for many years, but found that the pool was dry during the dry season. The study area is a dry pool with water in some parts. The pool has a width, length, and depth of 100 x 120 x 3 meters, respectively. The hydrogeological conditions consist of sedimentary and Triassic meta-sedimentary aquifers, including greywacke, greenish grey, massive with bedded sequence of shale, limestone and conglomerate in the area surrounded. Such weathered rocks can be seen in some areas and found it on the outcrop during a preliminary field survey around the pool.

Geophysical surveying with a SEUBSAK SS-10 instrument using a resistance measurement method. The Wenner configuration was used in the survey within the range of 120 meters long, and the depth is approximately 20 meters, covering the long side of the pool. The collected data from the survey was processed using a computer software named IPI2Win. The obtained result is displayed as a pseudo geophysical cross-section by analyzing the measured electrical, geological layers classification, depths, and thicknesses of soil and rock layers. The interpretation used as information for pool digging plan at an increased depth from the original.

The result of the reservoir digging design provided by the American Groundwater Solution (AGS) for increasing the pool depth has shown that when excavating the pool for an additional depth of 5-7 meters and at the middle part of the pool for the depth of 7-11 meters, it was found that water from shallow aquifer flows into the pool. This shallow groundwater accumulates in the weathered meta-sedimentary aquifers. Therefore, the shallow groundwater flows into the pool until the water level in the pool is complete, and not reduced even during the dry season. Consequently, the SCAT can utilize the water from the additional pools throughout the year.

In addition, it was also found the shallow groundwater has the results of water quality analysis in accordance with the standards of the Ministry of Natural Resources and Environment. Hence, we can conclude that applying geophysical methods to support the geological layers, depth and thickness classification with high precision and provide good information for pool digging design to reach the shallow aquifer. Therefore, this is considered a successful activity for the water management project in the context of the community and can effectively solve the water shortage problem in the SCAT area.

**Keywords:** Applied Geophysical Methods, Shallow Groundwater, Weathered Meta-Sedimentary Aquifers, Community-based Water Management