

ABSTRACTS OF THE PAPER PUBLISHED ONLY IN THE TURKISH EDITION OF THIS BULLETIN

DISCOVERY OF A NEW GEOTHERMAL FIELD BY GEOLOGICAL, GEOPHYSICAL AND GEOCHEMICAL METHOD ÜÇBAŞ - ŞAPHANE - KÜTAHYA

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ABSTRACT.- The basement rock of the studied area have represented by Paleozoic aged core rocks which composed of flaser gneiss, migmatitic gneiss which covered by surrounding Upper Paleozoic-Lower Mesozoic aged cover rocks which are composed of schist, marble crystallized limestone belong to Northern margin of the Menderes Massive. The rocks of the Menderes massive are overlain tectonically by Dağardı Ophiolitic Melange which is composed of serpentinized mafic and ultramafic rocks, limestone olistoliths and blocks. All these rocks units are covered by Miocene to Pliocene aged lacustrine sediments interlayer volcanic levels. Geological remote sensing, detail geology, hydrothermal alteration, aerial photo studies, hydrogeology (hydrochemistry and isotope hydrology), geophysical (magnetotelluric and resistivity); drilling, well logging studies have been carried out in the study area from 2003 to 2006. Gediz geothermal area is one of the medium enthalpy geothermal areas in the Western Anatolia. The hot spring temperature is 70-76 °C in the area. The main aims of this study by means of getting data from Gediz-Abide field and collected other region to simulate each other to detect whether or not presence of promising area as buried geothermal system around there. At the and geology, hydro geochemistry and isotopic studies it has been found out a promising area which is covered under thick sediments near Şaphane-Üçbaşı area at 5km northern part of the Gediz-Abide field. There is no manifestation in around the Shaphane-Üçbaşı buried geothermal area at the surface. Geophysical (Magnetotelluric and resistivity) studies have shown two anomalies at Gediz-Abide and promising area. These anomalies have evidently low resistivity under the thick cover rocks and supported by geological hydrogeological and tectonical mapping. These two anomalies have been found also through the west along two profiles. Geothermal well (KŞÜ-1), have been drilled at 1330 m depth in 2006 at Şaphane-Üçbaşı promising area. Geothermal fluid which have 40 l/s, flow rate and 90 °C were produced from the well using compressor test. 105.5 °C temperature has been measured end of 56 hours waiting after circulation at the bottom of the well. and 109 °C static temperature have been measured. KŞÜ-1 drilling thermal water is Na-SO₄-HCO₃ type and similar chemical composition to Gediz-Abide drilling hot waters. It can be suitable district heating (equivalent 1150 dwellings), heating green houses and thermal bath facilities.

Key words: Şaphane-Üçbaşı, geothermal field, water chemistry, hydrological isotope, magnetotelluric, resistivity, geothermal well.

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