# Litho-Facies Description and Fracture Evaluation of a Geothermal Reservoir in Indonesia: Critical Role of Electrical Borehole Imaging in Reservoir Characterization

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Role of an electrical borehole image becomes especially critical in reservoir characterization when the only other well data available are gamma- and temperature logs! The challenge becomes even bigger when the reservoir to be characterized is non-conventional and it contains geothermal energy! This paper reports such a case history documenting a successful application of borehole imaging in characterizing geothermal reservoirs of Indonesia.

An Operator in Indonesia deployed extended range micro-imager (XRMI), a current generation imager to describe complex volcanic reservoirs containing geothermal energy. Operational considerations allowed neither mud logs nor wireline logs except gamma ray and temperature. Borehole images were interpreted to accurately describe the litho-facies and diagnose fractures holding the geothermal energy. Image interpretation software called “sculpturing” (Chitale et. al. 2004) was used to quantify the fractured porosity.

This paper shows how XRMI and the software “sculpturing” achieved characterization of the andesite reservoirs containing geothermal energy, which was done without any help from other logs except gamma- and temperature. Further, the borehole images differentiated reservoirs from shales or impermeable rocks, which proved crucial for the Operator since the common shale indicator- gamma log was affected by radioactive minerals in the volcanics. Borehole images also enabled core-like description of the litho-facies thereby saving costs of conventional coring in a tough borehole environment. Thus, borehole imaging proved critical in the reservoir development efforts and significantly reduced the E&P risks for the Operator in these geologically complex areas of Indonesia.