

## **ABSTRACT**

### **ANALYSIS OF GEOTHERMAL SYSTEM IN NORTHWEST REGION OF “ES” AREA BASED ON 2D INVERSION MAGNETOTELLURIC MODEL AND GEOCHEMISTRY DATA**

**By**

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Has done research by using magnetotelluric method (MT) and geochemistry in northwest region of “ES”, East Java. Magnetotelluric method (MT) is a geophysical exploration method that uses a natural source of electromagnetic waves (EM) that vary with time to map the subsurface contrasts resistivity of rock. The magnetotelluric method is used to build a 2D modelling and the geochemical analysis is performed to obtain the characteristics of geothermal system (type of fluid and reservoir temperature) so getting geothermal system model. Based on modeling results the caprock layer has a resistivity value about 9-15  $\Omega \cdot m$  with depth 100-500m and thickness about 300-400m. Layer which has a resistivity value of 10  $\Omega \cdot m$  is estimated as a reservoir and located on a depth about 500-1000m with thickness of 800-1500m. Spring water manifestation in the research area is included as a bicarbonate ( $HCO_3$ ), which is a mixture of reservoir water with meteoric water (surface water) and located in lateral outflow region with reservoir temperature for about 350°C.

**Keywords :** Magnetotelluric, Geochemical/geochemistry, Geothermal system, Caprock, Reservoir.