Delineasi sistem panas bumi daerah "H" dengan menggunakan inversi 3-D data magnetotellurik terintegrasi data geokimia dan geologi = Delineation of geothermal system field H by using 3 D inversion magnetotelluric data integrated with geochemical and geological data

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Abstrak

Telah dilakukan penelitian guna mendelineasi sistem panas bumi lapangan geothermal ldquo;H rdquo;. Penelitian ini menggunakan metode remote sensing untuk memetakan struktur dan alterasi di permukaan. Analisis geokimia digunakan untuk mengetahui karakteristik sistem panas bumi dan analisis geofisika digunakan untuk memetakan kondisi sistem panas bumi di bawah permukaan. Berdasarkan analisis remote sensing dengan teknik band combination secara pengamatan manual menunjukkan bahwa arah utama dari kelurusan - kelurusan yang berkembang di daerah penelitian ldquo;H rdquo; adalah Barat Laut - Tenggara dan Barat Daya - Timur Laut sesuai dengan Peta Geologi Regional yang berkorelasi dengan kemunculan beberapa manifestasi. Analisis remote sensing juga menemukan 1 lokasi yang diduga merupakan alterasi di permukaan. Analisis data geokimia dilakukan terhadap 12 manifestasi menunjukkan bahwa mata air panas SL-1, SL-2, SLM-1, SLM-2, HTS-1, HTS-2, HTS-3, TBK, TLH-1, TLH -2, TLH-3 dan TLH- 4 merupakan manifestasi tipe outflow.
Berdasarkan diagram segitiga ternary Na - K - Mg, diagram Na-K/Mg-Ca, diagram Enthalpy - Chloride Mixing Model, geothermometer Na/K menunjukkan temperatur reservoar adalah sekitar 210 C - 240 C dan dapat dikategorikan ke dalam sistem geothermal moderate to high temperature. Analisis Inversi 3-D Data MT menggunakan 66 data titik ukur. Berdasarkan inversi 3-D Data MT diketahui bahwa lapisan clay cap dengan nilai resistivitas rendah le; 10 ?m tersebar di Selatan dengan ketebalan 500 meter hingga 1000 meter. Lapisan reservoar terletak di bawah clay cap dengan nilai resistivitas >10 - 65 ?m. Base of Conductor BOC diperkirakan berada pada kedalaman 700 meter dengan updome berada di antara Sesar Wairutung dan Sesar Banda. Berdasarkan peta BOC diperoleh luas area prospek geothermal sekitar 16.5 km2.
<hr /><i>The study of ldquo H rdquo geothermal field has been conducted to delineate their geothermal system. This study uses remote sensing method for mapping structure and alteration on the surface. Geochemical analysis is used to determine the characteristics of geothermal system and geophysical analysis is used to interpret the condition of geothermal system of sub surface. Based on remote sensing analysis using band combination technique with manual observation indicates that the main direction of the developed lineaments in the research area H is Northwest Southeast and Southwest Northeast in accordance with Regional Geological Map correlated with the appearance of several manifestations. The remote sensing analysis also found 1 suspected alteration site on the surface. Analysis of geochemical data was performed on 12 manifestations shows that hot springs SL 1, SL 2, SLM 1, SLM 2, HTS 1, HTS 2, HTS 3, TBK, TLH 1, TLH 2, TLH 3 and TLH 4 are outflow manifestations type.
Based on the diagram of the ternary triangle Na K Mg, Na K Mg Ca diagram, Enthalpy Chloride Mixing Model diagram, Na K geothermometer estimates the reservoir temperature is about 210 C 240 C and can be categorized into the moderate to high temperature geothermal system. Analysis of inversion 3 D MT data using 66 data points measurement. Based on 3 D inversion MT data is known that clay cap layer with low

resistivity value le 10 m spread in South with thickness 500 meter to 1000 meter. The reservoir layer is located under clay cap with resistivity value 10 m 65 m. Base of Conductor BOC is estimated to be at depth of 700 meters with an updome located around Wairutung Fault Banda Fault. Based on BOC, the prospectable area of geothermal system is about 16.5 km2.</i>