

Delineasi karakteristik dan geometri reservoir berdasarkan interpretasi data 3G pada lapangan geothermal "A" = Delineation of characteristic and reservoir geometry based on 3G data interpretation in a geothermal field / Kms Novranza

Kms Novranza, author

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Abstrak

ABSTRAK

Telah dilakukan penelitian guna mendelineasi karakteristik dan geometri reservoir pada lapangan geothermal "A" berdasarkan interpretasi data 3G. Penelitian ini menggunakan metode remote sensing untuk memetakan struktur dan alterasi di permukaan. Analisis geokimia digunakan untuk mengetahui karakteristik sistem geothermal dan analisis geofisika digunakan untuk memetakan kondisi sistem geothermal di bawah permukaan. Berdasarkan analisis remote sensing dengan menggunakan teknik band combination secara pengamatan manual diketahui bahwa arah utama dari kelurusan-kelurusan yang berkembang di daerah penelitian A adalah Barat laut-Tenggara. Kelurusan ini berkorelasi dengan kemunculan manifestasi permukaan. Analisis remote sensing juga menemukan 4 lokasi yang diduga terdapat alterasi di permukaan. Analisis data geokimia menunjukkan bahwa manifestasi SE dan KB merupakan manifestasi tipe upflow dan manifestasi yang muncul di BB, SU, TR dan SJ merupakan tipe manifestasi outflow. Geothermometer gas menunjukkan temperatur reservoir adalah sekitar 250 °C. Analisis data geofisika menggunakan 37 data titik ukur magnetotellurik dan 286 titik ukur gravitasi. Berdasarkan inversi 3D data MT dan pemodelan gravitasi, diketahui bahwa lapisan clay cap dengan nilai resistivitas rendah ($10 \times 10^{-3} \Omega \cdot m$) dan densitas 2,3 gr/cc tersebar di sekitar manifestasi SE mulai di dekat permukaan dan melebar ke arah MAP BB dengan ketebalan 1500 meter sampai 2000 meter. Batuan clay cap diduga terdiri dari satuan batuan Lava KB Muda yang mengalami alterasi hidrothermal. Lapisan reservoir terletak di bawah clay cap dengan nilai resistivitas $>10 \times 10^{-3} \Omega \cdot m$ dan densitas 2,4 gr/cc yang diduga merupakan satuan batuan KB Tua 2. Base of Conductor (BOC) diperkirakan berada pada kedalaman 1500 m dengan updome berada di bawah manifestasi SE. Luas area prospek pada lapangan geothermal A berdasarkan peta BOC adalah sekitar 18 km².

ABSTRACT

The research had been conducted to delineate characteristic and reservoir geometry in "A" geothermal field based on 3G data interpretation. This research used remote sensing method to map the structure and alteration on the surface. Geochemical and geophysical analysis are used to identify the geothermal system

characteristic and map geothermal system condition in the subsurface. Based on the remote sensing analysis by using band combination in manual observation, the main direction of lineaments developed in area 'A' is North West-South East. This lineaments is corelated to the appearance of surface manifestation. The remote sensing analysis also found four locations which are inferred as alteration on the surface. The geochemical data analysis shows that SE and KB manifestations are the upflow type manifestation and manifestations which appear in BB, SU, TR, and SJ are the outflow type manifestations. Gas geothermometer shows that the reservoir temperature is about 250 °C. The analysis of geophysics data uses 37 magnetotelluric points and 286 gravity points. Based on 3D inversion and gravity modelling, it is found that the clay cap layer which has low resistivity value ($\approx 10 \Omega \cdot m$) and density 2.3 g/cc scatters around the SE manifestation, from the nearby surface and widen to MAP BB direction with thickness of 1500 meters to 2000 meters. Clay cap rock is interpreted as Lava KB Muda rock which undergoes hydrothermal alteration. Reservoir layer is located underneath clay cap with resistivity value $>10^6 \Omega \cdot m$ and density 2.4 g/cc which is interpreted as KB Tua 2 rock. Base of Conductor (BOC) is estimated to be within in the depth of 1500 m with the updome is beneath SE manifestation. The prospect area in 'A' geothermal field based on the BOC map is calculated about 18 km².