Analisis Struktur Geologi Bawah-Permukaan Berdasarkan Korelasi Data Sumur dan Data Geofisika Lapangan Geotermal "T" = Subsurface Structural Geology Analysis Based on Well Data Correlation and Geophysical Data in "T" Geothermal Field

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Abstrak

Walaupun sudah diprediksi dapat menghasilkan sebanyak 20 MW energi listrik, Lapangan Geotermal “T” masih belum dapat mencapai target tersebut bahkan setelah dibornya lima sumur. Dengan data dari lubang bor yang sudah tersedia, dilakukan analisis keberadaan feed zone untuk mencoba memetakan lapisan permeabel serta kemenerusan struktur geologi di Lapangan Geotermal “T”. Hasilnya, lapisan permeabel terduga reservoir berada pada rentang kedalaman 800 – 1400 m, dan dipotong oleh dua sesar normal yaitu Sesar Banda dan Sesar Banda-Hatuhasa yang menerus hingga kedalaman ±1400 m Kedua sesar tersebut memiliki arah kemiringan ke tenggara – selatan, dengan besar kemiringan 50° (Sesar Banda) dan 70° (Sesar Banda-Hatuhasa). Selain itu, data temperatur bawah-permukaan dan data geokimia Na/K menunjukkan bahwa pusat sistem panas bumi adalah G. Eriwakang. Dari hasil analisis tersebut, diperkirakan lokasi pengeboran terbaik untuk meningkatkan temperatur fluida panas bumi yang diekstraksi adalah dengan membuat sumur yang lebih dekat dengan G. Eriwakang dengan menargetkan sesar baru.
.....The previously predicted 20 MW electrical energy producing “T” Geothermal Field still has not reached said target even after five wells being drilled. Earlier studies showed that the center of geothermal system in the area was predicted to be below Mt. Eriwakang all along and not below Mt. Salahutu – Mt. Kadera as JICA had reported. Using temperature, pressure, and lithology datas acquired from existing wells, feed zone analysis were done in order to map permeable layers and faults’ continuities beneath the surface. The results showed that the major permeable layer is located at around 800 – 1400 m beneath the surface, being cut by two, 1400 m deep-normal faults named Banda Fault and Banda-Hatuhasa Fault. Both faults has shown south to southeast dip direction, facing the field’s heat source and upflow zone with dip value of ±50° for Banda Fault and ±70° for Banda-Hatuhasa Fault. Through subsurface temperature data and Na/K ratio analysis it is predicted that Mt. Eriwakang is the center of the geothermal system. From this analysis, it is assumed that the best location for drilling to increase extracted fluid’s temperature in the future would be near Mt. Eriwakang while targetting faults other than Banda and Banda-Hatuhasa.