

Rekonstruksi model konseptual geotermal di daerah Cisolok-Cisukarame menggunakan data gravitasi satelit GGMPlus dan magnetotellurik = Reconstruction of geothermal conceptual model in Cisolok-Cisukarame area using GGMPlus satellite gravity data and magnetotelluric data

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Abstrak

Wilayah Cisolok-Cisukarame merupakan area prospek geotermal liquid dominated geothermal system yang berlokasi di Kabupaten Sukabumi, Provinsi Jawa Barat, Indonesia. Aktivitas geotermalnya dicirikan dengan kemunculan manifestasi permukaan dalam bentuk mata air panas di sepanjang sungai Cisolok dan Cisukarame. Eksplorasi geotermal pertama di wilayah Cisolok-Cisukarame telah dilakukan sejak tahun 1970 dan sumur eksplorasi pertama dilakukan pada akhir 1986 di dekat mata air panas Cisolok hingga kedalaman 1200 meter dan mendapati temperatur di dasar sumur sebesar 120o C. Beberapa penelitian serupa telah dilakukan sebelumnya, namun model konseptual dari penelitian terdahulu belum secara akurat dapat menduga lokasi keberadaan reservoir dan heat source dikarenakan keterbatasan data sehingga interpretasi yang dilakukan belum tepat. Dalam penelitian ini, rekonstruksi model konseptual geotermal dilakukan untuk memecahkan permasalahan utama dalam menentukan keberadaan reservoir dan heat source, berbasis integrasi data geologi, geokimia, gravitasi satelit GGMPlus, dan magnetotellurik. Berdasarkan hasil interpretasi model konseptual yang telah direkonstruksi, keberadaan reservoir pada sistem geotermal Cisolok-Cisukarame diduga berada dibawah manifestasi permukaan Cisukarame yang berperan sebagai zona upflownya dan mengalami perluasan ke arah timur laut. Temperatur pada reservoir mencapai 235o C dengan sumber panas yang diduga berasal dari sisa panas Gunung Halimun berumur kuartar. Area prospek berdasarkan pertimbangan pola persebaran resistivitas serta batas reservoir diperkirakan memiliki luas sebesar 15 km² dengan top of reservoir pada kedalaman 500 - 1000 meter. Lokasi titik pemboran sumur eksplorasi direkomendasikan berada pada zona permeable timur laut manifestasi Cisukarame mencapai kedalaman 1000 meter pada zona dengan temperature yang tinggi. Diperkirakan area prospek reservoir masih mengalami perluasan ke arah utara dan timur laut, namun diperlukan survei geofisika lanjut untuk mengonfirmasi kemungkinan possible extend tersebut.

.....The Cisolok-Cisukarame region is a liquid dominated geothermal system prospect area located in Sukabumi Regency, West Java Province, Indonesia. Its geothermal activity is characterized by the appearance of surface manifestations in the form of hot springs along the Cisolok and Cisukarame rivers. The first geothermal exploration in the Cisolok-Cisukarame area has been carried out since 1970 and the first exploration well was carried out at the end of 1986 near the Cisolok hot spring to a depth of 1200 meters and found the temperature at the bottom of the well of 120o C. Several similar studies have been carried out before, but the model conceptual studies from previous studies have not been able to accurately predict the location of the reservoir and heat source due to limited data so that the interpretation is not correct. In this research, the reconstruction of the conceptual geothermal model is carried out to solve the main problems in determining the existence of reservoirs and heat sources, based on the integration of geological, geochemical, gravity satellite GGMPlus, and magnetotelluric data. Based on the interpretation of

the reconstructed conceptual model, the reservoir in the Cisolok- Cisukarame geothermal system is predicted below the surface manifestation of Cisukarame which acts as the upflow zone and is expanding to the northeast. The temperature in the reservoir reaches 235o C with the heat source predicted to come from the residual heat of Mount Halimun with quarter age. The prospect area based on consideration of the resistivity distribution pattern and reservoir boundary is estimated to have an area of 15 km² with a top of reservoir at a depth of 500 - 1000 meters. The location of the exploration well drilling point is recommended to be in the northeastern permeable zone of the Cisukarame manifestation reaching a depth of 1000 meters in a zone with high temperatures. It is estimated that the reservoir prospect area is still expanding to the north and northeast, but further geophysical surveys are needed to confirm the possibility of this possible extend.