

ABSTRAK

DELINEASI SUB-CEKUNGAN SEDIMEN DAN IDENTIFIKASI STRUKTUR BAWAH PERMUKAAN CEKUNGAN JAWA TIMUR UTARA WILAYAH PULAU MADURA MENGGUNAKAN ANALISIS GAYABERAT

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Metode gayaberat merupakan salah satu metode geofisika yang digunakan untuk menggambarkan struktur geologi bawah permukaan dan sub-cekungan berdasarkan variasi medan gravitasi bumi akibat perbedaan rapat massa. Penelitian ini dilakukan bertujuan untuk mengidentifikasi sub-cekungan sedimen dan struktur bawah permukaan di Cekungan Jawa Timur Utara wilayah Pulau Madura dengan analisis gayaberat yaitu dengan analisis *Second Vertical Derivative* (SVD), *First Horizontal Derivative* (FHD), *2D Forward Modelling*, dan *3D Inverse Modelling*. Dari hasil penelitian didapatkan bahwa adanya patahan berupa patahan naik dan turun yang diperkirakan menjadi batas sub cekungan yang diisi oleh beberapa formasi yaitu Aluvium, Pamekasan, Pasean, Madura, Ngrayong, dan Tawun. Selain itu, diidentifikasi terdapat 4 sub cekungan pada daerah penelitian diantaranya adalah Sub Cekungan Baratsungai, Sub Cekungan Kopang, Sub Cekungan Panglemah, dan Sub Cekungan Mundung. Dimana zona sub-cekungan dapat digunakan sebagai zona pembentukan minyak dan gas yang membuat minyak dan gas ini mengalami pematangan.

Kata kunci: Gayaberat, Patahan, Sub Cekungan, Madura

ABSTRACT

SEDIMENT SUB-BASIN DELINEATION AND IDENTIFICATION OF SURFACE STRUCTURES OF THE NORTH EAST JAVA BASIN IN THE MADURA ISLAND AREA USING GRAVITY ANALYSIS

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The gravity method is one of the geophysical methods used to describe subsurface and sub-basin geological structures based on variations in the Earth's gravitational field due to differences in mass density. This study was conducted with the aim of identifying sub-surface sedimentary sub-basins and subsurface structures in the North East Java Basin in the Madura Island region by means of gravity analysis, namely Second Vertical Derivative (SVD), First Horizontal Derivative (FHD), 2D Forward Modeling, and 3D Inverse Modeling analysis. From the results of the study it was found that there were faults in the form of up and down faults which were thought to be the boundaries of the sub-basin filled by several formations namely Alluvium, Pamekasan, Pasean, Madura, Ngrayong, and Tawun. In addition, it was identified that there were 4 sub-basins in the study area including the Barat-Sungai Sub-Basin, Kopang Sub-Basin, Panggulung Sub-Basin, and Mundung Sub-Basin. Where the sub-basin zone can be used as an oil and gas formation zone which makes this oil and gas mature.

Keywords: Gravity, Fault, Sub Basin, Madura