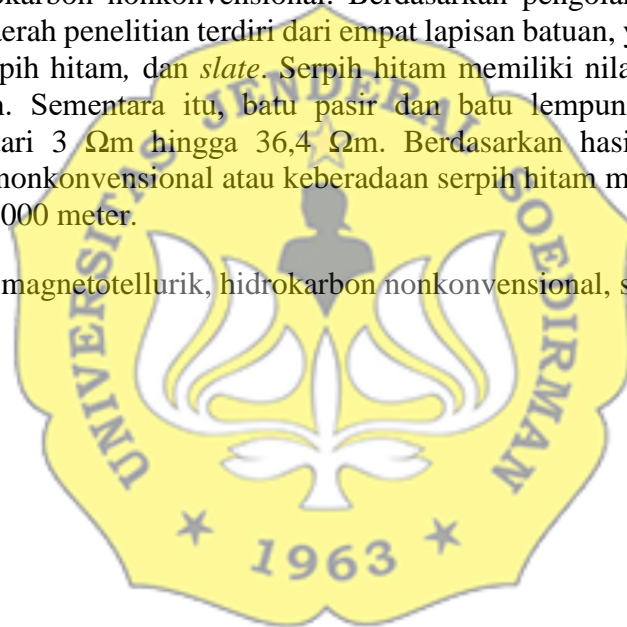


ABSTRAK

Pada penelitian ini, pengolahan data magnetotellurik (MT) dilakukan untuk menentukan daerah potensi hidrokarbon nonkonvensional yang terdapat di cekungan Kutai, Kalimantan Timur. Potensi hidrokarbon nonkonvensional tersebut berupa *shale gas* yang diduga berasal dari serpih hitam (*black shale*). Pengolahan data MT bertujuan untuk menentukan jenis batuan berdasarkan nilai resistivitas, serta memperoleh model bawah permukaan. Pengolahan data MT memiliki beberapa proses, yaitu transformasi fourier, *robust processing*, analisa *time series*, dan seleksi *crosspower* (XPR). Kemudian, dilakukan inversi 1D dan 2D untuk memperoleh nilai resistivitas sebenarnya serta penampang distribusi resistivitas di bawah permukaan. Dalam penelitian ini, hasil inversi 2D MT juga diintegrasikan dengan metode *gravity* untuk dapat menentukan keberadaan serpih hitam sebagai potensi hidrokarbon nonkonvensional. Berdasarkan pengolahan data yang telah dilakukan, daerah penelitian terdiri dari empat lapisan batuan, yaitu batu pasir, batu lempung, serpih hitam, dan *slate*. Serpih hitam memiliki nilai resistivitas kurang dari 4,6 Ωm . Sementara itu, batu pasir dan batu lempung memiliki rentang resistivitas dari 3 Ωm hingga 36,4 Ωm . Berdasarkan hasil delineasi, potensi hidrokarbon nonkonvensional atau keberadaan serpih hitam mulai ditemukan pada kedalaman 2.000 meter.

Kata kunci: magnetotellurik, hidrokarbon nonkonvensional, serpih hitam.



ABSTRACT

Data processing of magnetotelluric (MT) method is carried out to determine the potential of unconventional hydrocarbon regions in the Kutai basin, East Kalimantan. The potential for unconventional hydrocarbons in the form of shale gas is thought to come from black shale. Data processing aims to determine the type of rock based on the resistivity, and obtain a subsurface model. MT data processing has several processes which consist of fourier transform, robust processing, time series analysis, and crosspower selection (XPR). Meanwhile, 1D and 2D inversion is carried out to obtain the true resistivity and the profile of the resistivity distribution below the surface. In this research, the results of 2D MT inversion were also integrated with gravity method to determine the presence of black shale as a potential of unconventional hydrocarbon. Based on the data processing that has been carried out, the study area consists of four rock layers, that is sandstone, claystone, black shale, and slate. Black shale has a resistivity less than 4,6 Ωm . Meanwhile, sandstone and claystone have resistivity ranges from 3 Ωm to 36,4 Ωm . Based on the results of delineation, the potential for unconventional hydrocarbons or the presence of black shale began to be found at a depth of 2000 meters.

Keywords: magnetotellurics, unconventional hydrocarbons, black shale.

