INTISARI

Pemodelan Inversi 2D Data Magnetotellurik pada Studi Kasus *Carbon Capture Storage* di Cekungan Eucla dan Mandala Musgrave, Australia Selatan

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Carbon Capture Storage (CCS) adalah salah satu teknologi untuk mengurangi kadar CO_2 di udara melalui penyimpanan geologi, baik dengan mekanisme injeksi di suatu reservoir sedimen (konvensional), maupun mekanisme *carbon mineralization* di batuan kristalin (non-konvensional). Pada penelitian ini dilakukan pemodelan inversi 2 dimensi (2D) menggunakan data magnetotellurik (MT) untuk mengetahui sebaran resistivitas bawah permukaan di area penelitian yang mencakup Cekungan Eucla hingga Mandala Musgrave, Australia Selatan. Data MT yang digunakan dalam penelitian ini merupakan data *open access* dari Departemen Energi dan Pertambangan Australia Selatan. Sebanyak 41 titik data pengukuran digunakan dan dibagi menjadi tiga lintasan yang membentang utara-selatan (2) dan timur barat (1).

Beberapa fitur konduktif (<1000 Ohm.m) ada di dalam pemodelan inversi 2D, antara lain berhubungan dengan *upper mantle, Everard Thrust,* intrusi *Giles Event, Karari Shear Zone, Mundrabilla Shear Zone* serta *basin*. Sedangkan fitur resistif (>1000 Ohm.m) pada model berasosiasi dengan *basement* batuan metamorf di lokasi penelitian. Kompleksitas *fault* yang dijumpai di sekitar Cekungan Officer dan Mandala Musgrave menjadi pertimbangan khusus apabila menjadikan Cekungan Officer dan Cekungan Eucla sebagai penyimpanan geologi dengan mekanisme CCS konvensional. Sedangkan dengan mekanisme CCS non-konvensional, Mandala Musgrave memiliki potensi penyimpanan yang baik di beberapa area dengan litologi batuan intrusif *mafic-ultramafic* yang ada akibat *Giles Event*.

Kata Kunci : magnetotellurik, inversi 2D, Eucla, Musgrave, Carbon Capture Storage

ABSTRACT

Two Dimensional Inversion Modelling of Magnetotelluric Data at the Case Study of Carbon Capture Storage in Eucla Basin and Musgrave Province, South Australia

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Carbon Capture Storage (CCS) is a technology to reduce CO_2 levels in the air through geological storage, either by injection mechanism in a sedimentary reservoir (conventional), or carbon mineralization mechanism in crystalline rock (non-conventional). In this study, 2-dimensional (2D) inversion modeling using magnetotelluric (MT) data was carried out to determine the distribution of subsurface resistivity in the study area which includes the Eucla Basin to Musgrave Province, South Australia. The MT data used in this study is open access data from the South Australian Department for Energy and Mining. A total of 41 measurement data points were used and divided into three lines, from north-south (2) and east-west (1).

Several conductive features (<1000 Ohm.m) exist in the 2D inversion modeling, associated to the upper mantle, Everard Thrust, Giles Event intrusion, Karari Shear Zone, Mundrabilla Shear Zone and basin. Meanwhile, resistive features (>1000 Ohm.m) in the model are associated with metamorphic rock basements at the research area. The complexity of the faults found around the Officer Basin and Musgrave Province is a special consideration when using the Officer Basin and Eucla Basin as geological storage with conventional CCS mechanism. Meanwhile, with non-conventional CCS mechanism, Musgrave Province has good storage potential in several areas with mafic-ultramafic intrusive rock lithology as a result of the Giles Event.

Keywords : magnetotelluric, 2D inversion, Eucla, Musgrave, Carbon Capture Storage.