ABSTRAK

PERENCANAAN *WATERFLOODING* PADA LAPANGAN "AAN" LAPISAN "AB" UNTUK MENINGKATKAN *RECOVERY FACTOR* MENGGUNAKAN SIMULASI RESERVOIR

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Lapangan "AAN" merupakan salah satu Lapangan minyak yang terletak di perairan utara subang, Lepas Pantai Jawa Barat Utara. Secara regional Lapangan "AAN" merupakan bagian dari cekungan Jawa Barat Utara dan Sub-Cekungan Ardjuna. Reservoir utama pada Lapangan ini terletak pada formasi *Upper* Cibulakan dan Parigi, dimana Lapisan "AB" merupakan sasaran utama dalam melakukan simulasi reservoir. Lapangan ini terdapat 30 sumur yang mulai dilakukan produksi pada tahun 1972. Berdasarkan hasil simulasi pada Lapangan "AAN" Lapisan "AB" mempunyai *Original Oil In Place* sebesar 115,25 MMSTB dan *Recovery Factor* sebesar 40,22 % dari nilai *Original Oil In Place*. Lapangan "AAN" Lapisan "AB" juga mempunyai nilai *Ultimate Recovery* sebesar 46,26 MMSTB dan *Remaining Reserves* sebesar 16,73 MMSTB.

Pada Simulasi Reservoir yang dilakukan pada penelitian ini dikerjakan dengan tahapan pengumpulan data berupa data geologi dan geofisik, data reservoir, data produksi, dan data penunjang. Pada data geologi dan geofisik didapatkan peta persebaran untuk model statik, sedangkan pada data reservoir didapatkan data PVT dan analisa core, lalu untuk data produksi didapatkan data laju produksi setiap sumur, dan untuk data penunjang didapatkan data perforasi. Lalu menginput data ke simulator dengan tahapan inisialisasi, *history matching*,dan dilanjutkan prediksi dengan berbagai skenario.

Pada tahap prediksi dilakukan penambahan sumur *waterflooding* dengan melakukan analisa pada peta *mobile oil in place* (MOIP) dan *Saturation Oil* (SOIL). Terdapat 3 skenario yang dilakukan pada Lapangan ini dengan Skenario terbaik yang dipilih adalah skenario 3A karena memiliki nilai kumulatif produksi dan *recovery factor* tertinggi diantara skenario lainnya.

Kata kunci: Simulasi, Reservoir, *Waterflooding*, *Recovery Factor*, *Mobile Oil In place*, *Saturation Oil*,

ABSTRACT

WATERFLOODING PLANNING IN THE "AAN" FIELD "AB" RESERVOIR LAYER TO IMPROVE RECOVERY FACTOR USING RESERVOIR SIMULATION

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The "AAN" Field is one of the oil fields located in the northern offshore area of Subang, Northwest Java Offshore. Regionally, the "AAN" Field is part of the Northwest Java Basin and the Ardjuna Sub-Basin. The main reservoirs in this field are located in the Upper Cibulakan and Parigi formations, where the "AB" layer is the primary target for reservoir simulation. This field comprises 30 wells that have been producing since 1972. Based on reservoir simulation results, the "AB" layer of the "AAN" Field has an Original Oil in Place (OOIP) of 115.25 MMSTB and a Recovery Factor of 40,22% of the Original Oil In Place. The "AB" layer also has an Ultimate Recovery of 46,26 MMSTB and Remaining Reserves of 16,73 MMSTB.

The reservoir simulation conducted in this study was carried out through several stages, beginning with data collection, which included geological and geophysical data, reservoir data, production data, and supporting data. Geological and geophysical data were used to generate distribution maps for the static model, while reservoir data included PVT data and core analysis. Production data consisted of well production rates, and supporting data included perforation data. These data were then input into the simulator through the stages of initialization and history matching, followed by production forecasting using various scenarios.

During the prediction stage, additional waterflooding wells were implemented based on analysis of the Mobile Oil in Place (MOIP) and oil saturation (SOIL) maps. Three development scenarios were evaluated in this field, with Scenario 1A selected as the optimal scenario due to its highest cumulative oil production and recovery factor compared to the other scenarios.

Keywords: Simulation, Reservoir, Waterflooding, Recovery Factor, Mobile Oil In Place, Saturation Oil