

RINGKASAN

ANALISA INJEKSI AIR PADA LAPISAN N-73 MENGUNAKAN SIMULATOR IPM-MBAL DI LAPANGAN “AK”

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Lapisan N-73 Lapangan “AK” mulai berproduksi pada tahun 1998. Berdasarkan data PVT pada lapisan tersebut dalam kondisi *undersaturated* dan memiliki nilai *water cut* yang sangat tinggi sebesar 99,4% pada april 2019. Seiring kegiatan produksi beberapa sumur produksi mengalami *shut in* dan terdapat 2 sumur injeksi yang mengalami *problem out of zone injection* yakni K-8 dan K-10. Berdasarkan hal tersebut dilakukan analisa *performance* injeksi untuk mengetahui penyebab *problem* tersebut terjadi.

Metode yang digunakan dalam penelitian ini yakni kuantitatif dan kualitatif dengan menggunakan simulator IPM-MBAL. Pada analisa kuantitatif terlebih dahulu dilakukan analisa terhadap sumur injeksi menggunakan metode *hall plot* serta analisa sumur produksi menggunakan *chan's plot*. Pada analisa kualitatif dimulai dengan melakukan PVT *match*. Setelah PVT *match* dan penginputan data model *tank* selesai. Selanjutnya, dilakukan penyelarasan data tekanan dengan simulator (*analytical method*). Dilakukan *regresi* terhadap model *water influx* agar *history* tekanan dan simulator *match*. Setelah itu, dilakukan analisa berupa *simulation result* dan *energy plot*.

Hasil *simulation result* berupa analisa *performance* injeksi terhadap *pressure* disimpulkan bahwa injeksi yang dilakukan pada lapisan N-73 berpengaruh pada kenaikan *pressure* dan kurang efisien terhadap kenaikan *oil rate* akibat sebagian air keluar dari zona injeksi karena *rate* yang terlalu besar berdasarkan analisa *hall plot*. Pada analisa *performance* injeksi terhadap saturasi air bahwa adanya kenaikan saturasi air akibat *problem* produksi yakni *channeling* dan *bottom coning* berdasarkan analisa *chan's diagnostic* sehingga air lebih awal terproduksi dan peningkatan air menjadi lebih cepat. Pada analisa *energy plot*, bahwa *energy* yang bekerja berupa kombinasi antara *fluid expansion*, *water influx*, dan injeksi air yang berpengaruh pada tekanan.

Kata kunci: injeksi air, IPM-MBAL, *hall Plot*, *chan's plot*,

ABSTRACT

ANALYSIS OF WATER INJECTION IN N-73 LAYER USING IPM-MBAL SIMULATOR AT “AK” FIELD

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Layer N-73 Field "AK" began production in 1998. Based on PVP data, the layer is undersaturated and has a very high water cut value of 99.4% in April 2019. Along with production activities, several production wells have been shut in and there are 2 injection wells that experience problems out of zone injection, namely K-8 and K-10. Based on this, an injection performance analysis is carried out to determine the cause of the problem.

The methods used in this study are quantitative and qualitative using the IPM-MBAL simulator. In quantitative analysis, analysis of injection wells using the hall plot method and production well analysis using chan's plot was carried out. Qualitative analysis begins with PVP match. After PVT match and tank model data input is complete. Furthermore, pressure data alignment with simulators (analytical method) is carried out. Regression was carried out on the water influx model so that the pressure history and simulator match. After that, analysis was carried out in the form of simulation results and energy plots.

The results of the simulation results in the form of injection performance analysis of pressure concluded that the injection carried out in the N-73 layer had an effect on increasing pressure and was less efficient for the increase in oil rate due to some water coming out of the injection zone because the rate was too large based on hall plot analysis. In the analysis of injection performance on water saturation that there is an increase in water saturation due to production problems, namely channeling and bottom coning based on chan's diagnostic analysis so that water is produced earlier and the increase in water becomes faster. In the energy plot analysis, that the energy that works is a combination of fluid expansion, water influx, and water injection which affects pressure.

Keywords: water injection, IPM-MBAL, hall Plot, chan's diagnostic