

RINGKASAN

HASIL ANALISA *PRESSURE BUILD-UP TEST* UNTUK PENENTUAN PRODUKTIVITAS SUMUR “RW” LAPANGAN “WHD”

Oleh
Rokhimatul Wakhidah
NIM : 113160117
(Program Studi Sarjana Teknik Perminyakan)

Sumur “RW” pada lapangan “WHD” terletak di Cekungan Sumatera Tengah dimana zona perforasinya ada pada formasi *Upper Red Bed* yang batuan formasinya didominasi oleh *sandstone* merupakan sumur minyak yang mengalami penurunan produksi sehingga perlu dilakukan *well testing*.

Pada penulisan tugas akhir ini dilakukan analisa data uji tekanan dengan *pressure build up test* secara manual menggunakan metode *Horner*. Pelaksanaan *Pressure Build – Up* dilakukan dengan memproduksi sumur dengan laju alir konstan selama suatu selang waktu tertentu, kemudian menutup sumur tersebut. Penutupan sumur ini menyebabkan naiknya tekanan yang dicatat sebagai fungsi waktu. Selain itu, diperoleh karakteristik batuan reservoir dari data *logging* dan *coring*, karakteristik fluida reservoir dari data PVT dan data penunjang seperti litologi formasi sumur tersebut.

Dari data yang diperoleh dilakukan analisa menggunakan metode *horner* secara manual dengan cara membuat grafik log-log plot yaitu plot antara log dt dengan log Pws yang akan menghasilkan EOWBS. Selanjutnya membuat grafik semi log plot yaitu plot antara Pws dengan log (tp+dt)/dt yang akan menghasilkan tekanan reservoir (P*), P 1 jam dan *slope* (m). Selanjutnya dilakukan perhitungan yang akan memperoleh besar permeabilitas efektif minyak, skin, penurunan tekanan akibat skin, *productivity index* (PI) dan *flow efficiency*.

Berdasarkan analisa *pressure build-up test* pada sumur “RW” dengan menggunakan metode *horner plot* didapatkan hasil tekanan reservoir sebesar 1085 Psia, permeabilitas efektif sebesar 9,45 mD, skin 3,038, perbedaan tekanan akibat skin sebesar 145,37 Psia, *productivity index* sebesar 0,294 STB/d/psia, serta *flow efficiency* sebesar 0,645.

Harga skin positif menunjukkan bahwa sumur “RW” mengalami kerusakan formasi. Penurunan tekanan yang terjadi akibat skin juga besar dan didukung oleh harga FE yang besarnya kurang dari 1 sehingga dapat menjadi identifikasi bahwa sumur tersebut mengalami kerusakan formasi. Akibat dari kerusakan formasi tersebut permeabilitas batuan juga menjadi rendah sehingga produksi dari sumur “RW” menurun. Maka direkomendasikan untuk dilakukan Tindakan stimulasi untuk memperbesar permeabilitas.

Kata kunci : *Pressure Build-Up, Horner*

ABSTRACT

RESULTS OF PRESSURE BUILD-UP TEST ANALYSIS FOR DETERMINING THE PRODUCTIVITY OF THE "RW" WELL IN THE "WHD" FIELD

By

Rokhimatul Wakhidah

NIM : 113160117

(Petroleum Engineering Undergraduated Program)

The "RW" well in the "WHD" field located in the Central Sumatra Basin where the perforation zone is in the Upper Red Bed formation whose formation rock is dominated by sandstone is an oil well that has decreased production so it is necessary to do well testing.

In the writing of this final project, the pressure test data is analyzed with a pressure build up test manually using the Horner method. The implementation of Pressure Build - Up is done by producing a well with a constant flow rate for a certain time interval, then closing the well. Closure of the well causes a rise in pressure which is recorded as a function of time. In addition, reservoir rock characteristics are obtained from logging and coring data, reservoir fluid characteristics from PVT data and supporting data such as the lithology of the well formation.

From the data obtained, an analysis is carried out using the horner method manually by making a log-log plot graph, namely a plot between $\log dt$ and $\log P_{ws}$ which will produce EOWBS. Next, make a semi-log plot graph, that is, a plot between P_{ws} and $\log (tp+dt)/dt$ which will produce reservoir pressure (P^), P 1 hour and slope (m). Then, the calculation will obtain the effective permeability of oil, skin, pressure drop due to skin, productivity index (PI) and flow efficiency. Based on the analysis of the pressure build-up test at the "RW" well using the horner plot method, the reservoir pressure of 1085 Psia, effective permeability of 9.45 mD, skin of 3.038, pressure difference due to skin of 145.37 Psia, productivity index of 0.294 STB/d/psia, and flow efficiency of 0.645 were obtained.*

The positive skin price indicates that the "RW" well is experiencing formation damage. The pressure drop that occurs due to skin is also large and is supported by the FE price which is less than 1 so that it can be an identification that the well is experiencing formation damage. As a result of the formation damage, the permeability of the rock also becomes low so that the production from the "RW" well decreases. Therefore, it is recommended to perform stimulation action to increase permeability.

Keywords: Pressure Build-Up, Horner