

ABSTRAK

OPTIMISASI PEMODELAN *HYDRAULIC FRACTURING* TERHADAP PERMASALAHAN *PROPPANT FLOWBACK* *SUMUR DF-007*

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Sumur DF-007, Lapangan IA, Formasi Talang Akar memiliki permeabilitas rendah yang menghambat produktivitas sumur. Untuk meningkatkan performa produksi, perlu dilakukan operasi *hydraulic fracturing* pada sumur tersebut. Namun, setelah dilakukan operasi *hydraulic fracturing* ditemukan masalah *proppant flowback* saat sumur mulai diproduksi kembali. Masalah ini mengganggu kinerja produksi serta mengakibatkan akumulasi *proppant* di peralatan bawah permukaan dan di permukaan. Permasalahan ini mengindikasikan perlu analisis komprehensif terkait faktor terjadinya masalah *proppant flowback*, sebelum menentukan solusi yang sesuai dengan penyebab utama masalah tersebut.

Alur penelitian ini diawali dengan menganalisis faktor terjadinya masalah *proppant flowback* seperti pengaturan manajemen produksi awal, *mechanical force factor*, dan *hydrodynamic force factor*. Setelah didapatkan isu utama atas permasalahan *proppant flowback* pada Sumur DF-007 yaitu *hydrodynamic force factor*, dilanjutkan tahap pemodelan ulang *hydraulic fracturing* dengan melakukan pemilihan ulang *proppant* dan fluida perekah. Penentuan solusi dilakukan melalui pemilihan fluida perekah YF135.1HTD yang memiliki viskositas tinggi untuk mengoptimalkan transportasi *proppant*, serta pemilihan kombinasi *proppant* konvensional dan penambahan *resin-coated proppant* ataupun *rod-shape proppant* pada stage akhir untuk memperkuat kestabilan lapisan *proppant*.

Hasil evaluasi menunjukkan bahwa penggunaan kombinasi fluida perekah YF135.1HTD dan *proppant* BorProp 16/20 (*Ceramic*) + 16/20 XRT Ceramax I (*Resin Coated Ceramic*) dapat meningkatkan permeabilitas formasi rata-rata dari 5,33 mD menjadi 181 mD, *skin factor* dari +11,65 (*damaged*) menjadi -6,03 (telah terstimulasi), *fold of increase* (FOI) sebesar 8,21 kali, serta peningkatan *rate gross* pada *inflow performance relationship* (IPR) dari yang sebelumnya 88 BFPD menjadi 880 BFPD. Skema optimasi ini juga berpotensi menekan risiko terjadinya *proppant flowback* pada masa produksi.

Kata kunci: *Hydraulic Fracturing*, *Proppant Flowback*, Fluida Perekah, *Proppant*.

ABSTRACT

OPTIMIZATION MODELING HYDRAULIC FRACTURING ON THE PROPPANT FLOWBACK ISSUE WELL DF-007

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Well DF-007, Field IA, Talang Akar Formation has low permeability that hinders the well's productivity. To improve production performance, hydraulic fracturing operations need to be conducted on the well. However, after the hydraulic fracturing operation, a proppant flowback issue was discovered when the well was put back into production. This issue disrupts production performance and causes the accumulation of proppant in downhole and surface equipment. This issue indicates the need for a comprehensive analysis of the factors causing the proppant flowback problem before determining a solution that addresses the root cause of the issue.

The research process begins with analyzing the factors causing proppant flowback issues, such as initial production management settings, mechanical force factor, and hydrodynamic force factor. After identifying the main issue of proppant flowback in Well DF-007, which is the hydrodynamic force factor, the next stage involves re-modeling the hydraulic fracturing by re-selecting the proppant and fracturing fluid. The determination of the solution was carried out by selecting the YF135.1HTD fracturing fluid, which has high viscosity to optimize proppant transport, as well as choosing a combination of conventional proppant and adding resin-coated proppant or rod-shape proppant in the final stage to strengthen the stability of the proppant layer.

The evaluation results show that the use of the YF135.1HTD fracturing fluid and the combination of BorProp 16/20 (Ceramic) + 16/20 XRT Ceramax I (Resin Coated Ceramic) proppant can increase the average formation permeability from 5.33 mD to 181 mD, the skin factor from +11.65 (damaged) to -6.03 (stimulated), the fold of increase (FOI) by 8.21 times, and the gross rate increase on the inflow performance relationship (IPR) from 88 BFPD to 880 BFPD. This optimization scheme also has the potential to reduce the risk of proppant flowback during the production period.

Keywords: Hydraulic Fracturing, Proppant Flowback, Fracturing Fluid, Proppant.