ABSTRAK

Pemboran pada Sumur B-001 mengalami kejadian *partial loss* dan *total loss circulation* ketika menembus Formasi Kujung pada trayek 12 ¼ ", tercatat tiga titik *partial loss* pada interval kedalaman 4830–4869 TVD dan tujuh titik interval *total loss* pada interval kedalaman 4941-5194 TVD, yang menyebabkan operasi pemboran tidak dapat dilanjutkan. Oleh sebab itu, dilakukan penanganan untuk mencapai target reservoir karbonat dengan *plug* LCM dan DOB2C pada trayek 12 ¼ ".

Metode penelitian yang digunakan meliputi beberapa tahapan yaitu pengumpulan data, pengolahan dan analisis data. Data pemboran dengan penentuan *pore pressure* dan *fracture gradient* menggunakan metode *D-exponent* dan *Eaton* untuk menentukan pengaruh *mud weight* yang digunakan. Selanjutnya, dilakukan analisa pada aspek formulasi dan konsentrasi, serta *mud properties* pada LCM yang digunakan, hasil analisa tersebut akan dijadikan acuan keberhasilan dan kegagalan dalam menanggulangi *problem loss circulation.* Selanjutnya, dilakukan analisa pada aspek formulasi dan konsentrasi DOB2C yang digunakan untuk alternatif penanggulangan lain setelah terjadi kegagalan penanggulagan *lost circulation* dengan metode *plug* LCM.

Berdasarkan hasil penelitian, kegagalan plug LCM pada penanganan *loss circulation* pada sumur B-001 terjadi karena adanya *vuggy formation* dan *cavernous formation*, bukan dikarenakan oleh pengaruh *mud weight* yang telah divalidasi oleh perhitungan tekanan dengan hasil Pf < Ph < BHCP < Prf serta ukuran partikel *fibrous* maupun *granular* LCM yang digunakan dalam lumpur tidak cukup besar untuk membentuk jembatan awal (*bridging*) pada mulut rekahan atau rongga. Maka dari itu diperlukan analisa alternatif lain penanggulangan lost circulation dengan DOB2C, analisa pada aspek konsentrasi, ratio DOB2C dan lumpur sebesar 2:1 lebih efektif dan efisien dengan rata rata volume pemompaan 2,32% dengan range pumping intensity hanya sebanyak 1-3 kali.

Kata Kunci: *Lost Circulation, Partial Loss, Total loss*, LCM *plug*, DOB2C

ABSTRACT

Drilling operations in Well B-001 experienced both partial loss and total loss circulation While penetrating the Kujung Formation within the 12¼-inch hole section, three partial loss zones were identified at the 4,830–4,869 ft TVD interval and seven total loss zones were encountered within the 4,941–5,194 ft TVD interval. These conditions prevented further drilling operations from proceeding. Therefore, remedial treatments using LCM plugs and DOB2C were implemented in the 12¼-inch hole section to enable drilling to reach the target carbonate reservoir..

This study employed a research methodology consisting of data collection, data processing, and data analysis stages. Drilling data were analyzed by determining pore pressure and fracture gradient using the D-Exponent and Eaton methods to evaluate the effect of the applied mud weight. Further analyses were conducted on the formulation, concentration, and mud properties of the LCM used. The results of these analyses were utilized to evaluate the success and failure factors in mitigating lost circulation problems. In addition, the formulation and concentration of DOB2C were analyzed as an alternative lost circulation treatment following the failure of the LCM plug method.

The results indicate that the failure of the LCM plug treatment in Well B-001 was primarily caused by the presence of vuggy and cavernous formations rather than by the applied mud weight. This conclusion was validated through pressure calculations, which satisfied the condition Pf < Ph < BHCP < Prf. Furthermore, the size of the fibrous and granular LCM particles incorporated into the drilling mud was insufficient to establish an initial bridge across the fracture openings or cavities. Consequently, an alternative lost circulation treatment using DOB2C was evaluated. The analysis showed that a DOB2C-to-mud ratio of 2:1 was more effective and efficient, requiring an average pumping volume of only 2.32% and a pumping intensity range of merely 1–3 pumping cycles.

***Keywords**: Lost Circulation, Partial Loss, Total loss, LCM plug, DOB2C*