

RINGKASAN

ANALISIS PENGGUNAAN *POLYAMINE MUD* PADA PEMBORAN SUMUR “ED-24” LAPANGAN “ES” DALAM MENGATASI *SHALE* DAN OPTIMASI BIAYA LUMPUR

Oleh
Ega Dimas Saputra
NIM: 113200077
(Program Studi Sarjana Teknik Perminyakan)

Lapangan “ES” merupakan struktur yang terletak di stratigrafi tersier Cekungan Sumatera Selatan dengan pengeboran sumur pengembangan yaitu sumur “ED-24” yang menggunakan *polyamine mud* untuk pertama kalinya. *Polyamine mud* dipilih karena lumpur KCl-Polymer yang sebelumnya digunakan pada pemboran *shale* Formasi Gumai di lapangan tersebut masih sering ditemukan permasalahan *sloughing shale*. Penelitian dilakukan dengan menganalisis keefektifan *polyamine mud* yang dipertimbangkan untuk diaplikasikan pada pemboran selanjutnya.

Analisis dilakukan berdasarkan *shale study* untuk melihat kecocokan *polyamine mud* dengan kondisi formasi. Kemudian, dilakukan analisis performa terhadap penggunaan *polyamine mud* berdasarkan *key performance indicator* pemboran trayek 17,5-inch dan 12,25-inch. Terakhir, ditarik kesimpulan.

Hasil *shale study* dari *cutting* sumur “GNK-97” Formasi Gumai menunjukkan tipe *shale kaolinite* dan bersifat dispersif sehingga dibutuhkan jenis aditif yang memiliki fungsi *encapsulator* seperti *polyamine*. Pada pemboran trayek 17,5-inch ditemukan *tight hole* akibat *swelling clay* pada kedalaman 561 mMD. Hal serupa tidak pernah terjadi pada pemboran sebelumnya menggunakan 10% KCl-Polymer sehingga lumpur tersebut dapat dipertimbangkan untuk digunakan kembali pada formasi yang sama, sedangkan penyebab utama terjadinya rontokan *shale* pada trayek 12,25-inch adalah kurangnya *mud weight*. Secara keseluruhan, *polyamine mud* efektif dalam menekan terdispersinya *solid* ke dalam lumpur, tidak adanya *balling*, dan permasalahan *hole cleaning* selama pemboran. Pertimbangan penggunaan 10% KCl-Polymer untuk pemboran selanjutnya pada formasi yang sama seperti trayek 17,5-inch dapat mengoptimasi biaya lumpur pemboran karena perkiraan biaya lumpur tersebut sekitar \$37,41/barrel, di mana biaya lumpur *polyamine* sekitar \$51,37/barrel. *Polyamine mud* tetap digunakan pada *lower formation* yang mengandung *shale* dispersif untuk menekan *solid dispersion*.

Kata kunci: *Polyamine Mud, Shale Study, Rontokan Shale, Biaya Lumpur.*

ABSTRACT

ANALYSIS OF POLYAMINE MUD UTILIZATION IN DRILLING WELL "ED-24" AT FIELD "ES" TO ADDRESS SHALE CHALLENGES AND OPTIMIZE MUD COSTS

By

Ega Dimas Saputra

NIM: 113200077

(Petroleum Engineering Undergraduated Program)

The "ES" field is a structure located within the Tertiary stratigraphy of the South Sumatra Basin, with the development well "ED-24" being drilled using polyamine mud for the first time. Polyamine mud was selected because the previously used KCl-Polymer mud in drilling the shale of the Gumai Formation in this field frequently encountered sloughing shale issues. This study was conducted to analyze the effectiveness of polyamine mud for potential application in future drilling operations.

The analysis was based on a shale study to assess the compatibility of polyamine mud with the formation conditions. Polyamine mud usage performance analysis was then conducted based on key performance indicators for the 17.5-inch and 12.25-inch drilling sections. Finally, conclusions were drawn.

The shale study results from the cuttings of the "GNK-97" well in the Gumai Formation indicated the presence of kaolinite-type shale, which is dispersive, necessitating an encapsulator such as polyamine. During the drilling of the 17.5-inch section, a tight hole due to swelling clay was encountered at a depth of 561 mMD, an issue that had never occurred with the use of 10% KCl-Polymer mud. Therefore, the latter can be considered for reuse in the same formation. Meanwhile, insufficient mud weight was the primary cause of sloughing shale in the 12.25-inch section. Overall, polyamine mud effectively reduced the dispersion of solids into the mud, prevented balling, and resolved hole cleaning issues during drilling. Considering the use of 10% KCl-Polymer mud for subsequent drilling in the same formation, such as the 17.5-inch section, could optimize drilling mud costs, with an estimated cost of \$37.41 per barrel, compared to polyamine mud at approximately \$51.37 per barrel. Polyamine mud should still be used in lower formations containing dispersive shale to control solid dispersion.

Keywords: Polyamine Mud, Shale Study, Sloughing Shale, Mud Cost.