

ABSTRACT

EVALUATION MUD PLANNING AND DRILLING HYDRAULICS IN 8½" "MD-27" WELL "MUDI" FIELD

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Well MD-27, located in the North East Java Basin with a target final depth of 9524 ftMD, traverses limestone lithology with non-reactive shale interbeds. This well encounters potential drilling hazards such as kick, necessitating an evaluation of drilling mud and hydraulic analysis for *cutting* cleaning in the 8½" interval.

The evaluation of drilling mud and hydraulics for well "MD-27" requires data from the well itself. The evaluation begins with assessing the type of mud used in the 8½" interval of well MD-27 and calculating the physical properties of the drilling mud. Subsequently, the Bit Hydraulic Horse Power (BHHP) method is used to determine optimal bit hydraulics, followed by planning effective *cutting* removal hydraulics with parameters of *cutting* transport ratio (Ft) $\geq 90\%$, *cutting* concentration (Ca) $< 5\%$, and *Particle Bed index* (PBI) ≥ 1 .

The evaluation results for drilling mud and hydraulics in the 8½" interval indicate that using water-based mud (WBM) with a density of 11.2 ppg is more optimal, economical, and environmentally friendly compared to oil-based mud (OBM) with a density of 10.9 ppg, which is less optimal as it fails to withstand formation pressure, potentially causing kick. The actual bit hydraulics with Hpb/HPs of 60.73% and annular hydraulics with a transport ratio (Ft) of 87.66%, *cutting* concentration (Ca) of 1.4%, and PBI of 0.6 indicate the presence of settled *cuttings*. Optimization was achieved by increasing pump pressure to 2614.9 psi and flow rate to 450 gpm, resulting in enhanced pump power and an HPb/HPs value of 65.22%. The transport ratio increased to 91.96%, *cutting* concentration to 2%, and PBI to 1, demonstrating more effective *cutting* removal and better borehole cleaning.

Keywords: drilling, mud, drilling hydraulics, cuttings