

Abstract

Evaluation and Optimization of Aerated Drilling Well-Z, Geothermal Field-M (case: trajectory -17 ½ inch, and 12 ¼ inch)

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The success of drilling is a key factor in the development of the geothermal field. Aerated drilling, the drilling technique "underbalanced", aims to improve the production wells, and in some cases, to overcome cleansing during drilling operations.

Aerated drilling technique can be applied using air (pure) or in combination with other drilling fluid, such as mist or foam stable or stiff foam, or mud, resulting in a circulating medium with a low density, which could eventually bring down the bottom hole pressure of the well during drilling operations into lower than the formation pressure.

In this study aerated drilling has been applied using a combination of air with water.

Article entitled "Evaluation and Optimization of Aerated Drilling Well-Z, Geothermal Field-M (case: trajectory-17 ½ inch, and 12 ¼ inch)", aims to evaluate the aerated drilling has been carried out in the geothermal field located in South Sumatra-Indonesia. Drilling is planned to be completed within 56 days.

The data used are pressure and temperature wells, basic mud-rheology, density and diameter of the cutting, mud and air flow rate, Rate Of Penetration (ROP), and Rotate Per Minute (RPM) on the bit.

Calculation steps include: gas injection volume, density and volumetric rate of air, liquid fraction in aerated, aerated viscosity, velocity and aerated flow pattern, cutting concentration (Cc) in the annular drill holes, cutting transport ratio (Ft), and cutting lifting rate.

The evaluation of five parameters during the drilling operation (aerated density (ρ), cutting transport ratio (Ft), the volume of gas injection (QGS), aerated flow pattern (NRE), and the concentration of cutting (Ca) at the borehole annulus) has been conducted, and then optimized.

Evaluation of these parameters indicate that the performance of aerated drilling operation on the trajectory has reached optimum conditions.

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