

ABSTRACT

Field development of Batang Field through infill drilling was an effort by PHE Siak to contribute to national oil production. Target formation of the drilling campaign was Bekasap Formation which is part of Central Sumatera Basin. During the drilling execution of these infill wells, loss circulation occurred on some of the wells especially when the drilling reaches 8.5 in hole section. The severity of loss circulation ranging from small partial loss to total loss. To optimize future drilling operation in Batang, analysis will be conducted to determine the cause, prevention, and mitigation of loss circulation event based on drilling history. The object of study in this resort will be based on drilling history of BTG-P1, BTG-P3R, BTG-P4R as sample wells.

Evaluation on loss circulation event in this research was done by analysing geological, lithological, and drilling engineering aspects. Method used in this research begins with analysing the cause of loss circulation on 8.5 in hole section that commonly occurs. Analysis then proceeded to analyse historical drilling parameter, such as: pump (MW, ECD, Pump Rate, Yp, RPM, SPM, dan ROP) recorded when loss circulation events occurred. The result from this analysis is used to determine the effect of loss circulation rate in form of statistical study, then finally, the effectiveness of methods applied to mitigate loss circulation in subsequent drillings will also studied.

Based on the analysis, it is known that the possible cause of loss circulation on infill well drilling in Batang is the reservoir properties and condition which having depleted or sub-normal average reservoir pressure (0.2 psi/ft). Depleted zone condition in Bekasap Formation caused the increase of rock effective stress and thus result in the more uncompacted rock matrix (unconsolidated sand). Loss circulation mitigation method on subsequent drilling by pumping LCM also proven to be not effective to combat loss in Batang Field drilling and it is recommended to apply other methods which are based on underbalance drilling concepts that have proven to mitigate loss circulation in future Batang Field drilling execution.

Keywords: loss circulation, Bekasap Formation, Batang Field, infill drilling