

## RINGKASAN

Pemboran eksploitasi Sumur "KWG UA" dengan kedalaman akhir 1800 mMD mengalami problem loss circulation pada setiap trayek (26", 17 ½", 12 ¼" dan 8 ½"). Permasalahan utama loss circulation yang terjadi meliputi total loss sampai dengan kedalaman 65 m pada trayek 26" dengan kedalaman akhir 98 m, partial loss 1.4-1.8 bpm sampai dengan kedalaman 486 mMD/472.54 mTVD pada trayek 17 ½" dengan kedalaman akhir 606 mMD / 586.27 mTVD, partial loss pada kedalaman 609 – 890 mMD pada trayek 12 ¼" dengan kedalaman akhir 1402 mMD, dan dinamis loss 3 BPM pada kedalaman 1405 - 1500 mMD / 1477.67 mTVD pada trayek 8 ½" dengan kedalaman 1800 mMD/1777 mTVD (TD) yang mana perlu dilakukan analisa dan identifikasi dari penyebab permasalahan utama loss circulation berdasarkan parameter geomekanika.

Langkah - langkah dalam melaksanakan analisa problem loss circulation berdasarkan parameter geomekanika diantaranya, perhitungan rock mechanics untuk mengetahui permasalahan loss circulation dengan menentukan sifat batuan brittleness berupa nilai brittleness index dengan kriteria high brittle nilai index lebih dari 0.48, medium brittle nilai index 0.32 – 0.47, less ductile nilai index 0.16 – 0.3, ductile nilai index 0 – 0.15 dan menentukan sifat batuan frackability berupa nilai frackability index dengan kriteria frackable nilai index lebih dari 0.55, not frackable nilai index kurang dari 0.55 serta menentukan ratio vertical stress dengan horizontal stress dengan kriteria nilai diatas 1 berpotensi terjadinya loss circulation. Sedangkan dari parameter hidrolika dengan menentukan perbandingan tekanan hidrodinamik dengan tekanan rekah, jika tekanan hidrodinamik lebih besar daripada tekanan rekah akan menambah potensi terjadinya loss baik total loss maupun partial loss pada zona yang memiliki nilai parameter rock mechanics dengan kriteria berpotensi terjadinya permasalahan loss circulation

Berdasarkan perhitungan parameter rock mechanics dan perhitungan parameter hidrolik, total loss terjadi pada trayek 12 ¼" interval kedalaman 655 m dengan kombinasi parameter meliputi nilai brittleness index 0.539 (high brittle), fracability index 0.710 (frackable), Q (laju alir) pompa sebesar 815 gpm, tekanan pompa sebesar 2000 psi, verticalstress Vs Horizontal Stress 1.21, tekanan hydrostatic sebesar 996.04 psi, tekanan hidrodinamik 1658.73 psi, dan tekanan rekah sebesar 1646.90 psi. pada trayek 8 ½" interval kedalaman 1776 m dengan kombinasi parameter meliputi nilai brittleness index 0.506 (high brittle), fracability index 0.633 (frackable), Q (laju alir) pompa sebesar 550 gpm, tekanan pompa sebesar 2400 psi, verticalstress Vs Horizontal Stress 1.24, tekanan hydrostatic sebesar 4164.67 psi, tekanan hidrodinamik 4970 psi, dan tekanan rekah sebesar 4559.43 psi. Total loss tersebut dilakukan penanggulangan dengan cara cement plug. Sedangkan partial loss terjadi pada trayek 8 ½" interval kedalaman 1415 m, dengan kombinasi parameter meliputi nilai brittleness index 0.587 (high brittle), fracability index 0.821 (frackable), Q (laju alir) pompa sebesar 550 psi, tekanan pompa sebesar 2400 psi, verticalstress Vs Horizontal Stress 1.21, tekanan hydrostatic sebesar 2400 psi, tekanan hidrodinamik 4317.28 psi, dan tekanan rekah sebesar 3704.86 psi. Total loss tersebut dilakukan penanggulangan dengan cara penggunaan LCM berupa Fibroseal, Diaseal, Kwikseal, fracseal, CaCO<sub>3</sub> dan menurunkan SG / berat jenis lumpur pemboran

## ABSTRACT

*Exploitation drilling of the “KWG UA” well with a final depth of 1800 mMD experienced loss circulation problems on each route (26”, 17”, 12” and 8”). The main problems of circulation loss that occur include total loss up to a depth of 65 m on the 26” route with a final depth of 98 m, partial loss of 1.4-1.8 bpm to a depth of 486 mMD/472.54 mTVD on the 17” route with a final depth of 606 mMD/586.27 mTVD, partial loss at a depth of 609 – 890 mMD on the 12” route with a final depth of 1402 mMD, and dynamic loss of 3 BPM at a depth of 1405 - 1500 mMD / 1477.67 mTVD on the 8” route with a depth of 1800 mMD/1777 mTVD (TD) which needs to be analyzed and identified the main causes of loss circulation problems based on geomechanical parameters.*

*The steps in carrying out analysis of loss circulation problems based on geomechanical parameters include rock mechanics calculations to determine loss circulation problems by determining brittleness rock properties in the form of brittleness index value with criteria for high brittle index value more than 0.48, medium brittle index value 0.32 – 0.47, less ductile index value 0.16 – 0.3, ductile index value 0 – 0.15 and determine the nature of the rock frackability in the form of a frackability index value with the criteria for frackable index value more than 0.55, not frackable index value less than 0.55 and determine the ratio of vertical stress to horizontal stress with the above value criteria 1 has the potential for loss circulation. Meanwhile, from the hydraulics parameters, by determining the ratio of hydrodynamic pressure to fracture pressure, if the hydrodynamic pressure is greater than the fracture pressure, it will increase the potential for loss, both total loss and partial loss, in zones that have rock mechanics parameter values with criteria for potential loss circulation problems.*

*Based on the calculation of rock mechanics parameters and the calculation of hydraulic parameters, the total loss occurs on the 12” route with a depth of 655 m with a combination of parameters including the brittleness index value of 0.539 (high brittle), fracability index 0.710 (frackable), Q (flow rate) pump of 815 gpm, pump pressure is 2000 psi, vertical stress vs horizontal stress is 1.21, hydrostatic pressure is 996.04 psi, hydrodynamic pressure is 1658.73 psi, and fracture pressure is 1646.90 psi. on the 8” route with a depth of 1776 m with a combination of parameters including brittleness index of 0.506 (high brittle), fracability index of 0.633 (frackable), pump Q (flow rate) of 550 gpm, pump pressure of 2400 psi, vertical stress Vs Horizontal Stress 1.24, hydrostatic pressure is 4164.67 psi, hydrodynamic pressure is 4970 psi, and fracture pressure is 4559.43 psi. The total loss is handled by means of a cement plug. While partial loss occurs on the 8” route with a depth of 1415 m, with a combination of parameters including the brittleness index value of 0.587 (high brittle), fracability index 0.821 (frackable), pump Q (flow rate) of 550 psi, pump pressure of 2400 psi, vertical stress Vs Horizontal Stress 1.21, hydrostatic pressure of 2400 psi, hydrodynamic pressure of 4317.28 psi, and fracture pressure of 3704.86 psi. The total loss is overcome by using LCM in the form of Fibroseal, Diaseal, Kwikseal, fracseal, CaCO<sub>3</sub> and reducing SG / specific gravity of mud drilling*