

RINGKASAN

Channeling pada semen di interval perforasi yang terjadi pada Sumur ANB-04 Lapangan NABEL pada formasi CD *Carbonate B* dan CD *Carbonate C* dengan litologi dominan *limestone* dan *claystone* serta kandungan gas CO₂ sebesar 3.035%. Beberapa faktor yang menyebabkan *channeling* yaitu diantaranya perencanaan penyemenan yang buruk, laju pemompaan (*pump rate*) yang tidak tepat, dan waktu *pumping* yang tidak tepat (*thickening time*).

Pada evaluasi *channeling* semen di interval perforasi dilakukan dengan melakukan perencanaan volume penyemenan, kemudian dihitung laju pemompaan (*pump rate*) dan *thickening time*, dan dilakukan analisa dan evaluasi data *primery cementing* dan kualitas semen berdasarkan USIT Log.

USIT log dapat secara efektif dan akurat mengidentifikasi keberadaan serta karakterisasi *channeling* pada semen di belakang *casing*. Dari gambar 2D terjadi *horizontal channeling* dari kedalaman 10350-10575 ftMD pada *casing joint* nomor 10-16 menunjukkan kualitas *bonding cement* yang buruk (*poor bonding*) dan *vertical channeling* 3D mulai dari kedalaman 10590-10605 ftMD pada *casing joint* nomor 10 dan 10790-10800 ftMD pada *casing joint* nomor 5 menunjukkan kualitas *bonding cement* yang buruk (*poor bonding*). Pada penyemenan 4-1/2" *liner* ini berdasarkan gambar 3D terlihat hubungan antara *vertical channeling* dan *horizontal channeling*, sehingga penyemenan dari bawah (*water zone*) terkoneksi *channeling* dengan bagian atas penyemenan (*water zone*), yang berpotensi terjadinya aliran air dari zona air ke perforasi minyak, yang berpotensi menjadikan *water cut* yang tinggi saat awal produksi.

Kata Kunci: *Channeling, USIT Log, Bonding Cement*

ABSTRACT

Channeling in the cement at the perforation interval in Well ANB-04, located in the NABEL Field, occurred in the CD Carbonate B and CD Carbonate C formations, which are predominantly composed of limestone and claystone, with a CO₂ gas content of 3.035%. Several factors contributed to the channeling, including poor cementing design, inappropriate pump rate, and incorrect pumping time (thickening time).

The evaluation of cement channeling in the perforation interval involved planning the cement volume, calculating the pump rate and thickening time, followed by analysis and evaluation of primary cementing data and cement quality based on the USIT log.

The USIT log can effectively and accurately identify the presence and characterize the nature of channeling in the cement behind the casing. From the 2D image, horizontal channeling is observed from a depth of 10350-10575 ftMD at casing joints number 10-16, indicating poor cement bonding quality. Additionally, 3D vertical channeling is observed from a depth of 10590-10605 ftMD at casing joint number 10, and from 10790-10800 ftMD at casing joint number 5, both indicating poor cement bonding quality. In the cementing of the 4-1/2" liner, the 3D image shows a connection between the vertical and horizontal channeling, revealing that the cement from the lower section (water zone) is connected to the upper part of the cement (water zone) through channeling. This condition has the potential to cause water flow from the water zone to the oil perforation zone, which may result in a high water cut during early production.

Keywords: Channeling, USIT Log, Bonding Cement