

## RINGKASAN

### **DESAIN PENYEMENAN SUMUR X-2 MENGGUNAKAN METODE *MANAGED PRESSURE CEMENTING* BERDASARKAN DATA SUMUR YANG BERSEBELAHAN**

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Sumur X-2 merupakan sumur infill yang akan dibor hingga kedalaman 5100 ft. Berdasarkan data grafik PPFG dari sumur yang bersebelahan yaitu sumur X-1, terlihat pada kedalaman 2361 - 2366 ft menunjukkan adanya jarak yang sempit antara tekanan pori (10.26 lb/gal) dan tekanan rekah formasi (10.83 lb/gal) sehingga mengakibatkan problem *loss & kick* pada sumur X-1. Maka operasi penyemenan direncanakan menggunakan teknik *Managed Pressure Cementing* (MPC) yang dimana pekerjaan penyemenan direncanakan menggunakan *spacer* & bubuk semen dengan densitas rendah sambil mengaplikasikan SBP melalui pengaturan MPD.

Perencanaan penyemenan diawali dengan mengumpulkan data-data seperti data geologi, potensi *drilling hazard*, data tekanan dan *trajectory* sumur yang diambil dari data sumur yang bersebelahan yaitu sumur X-2. Desain penyemenan yang dibahas meliputi perencanaan penyemenan casing 9-5/8" dan menguraikan rencana operasi MPC pada sumur X-2 khususnya pada casing 9-5/8".

Proses penyemenan casing 9-5/8" pada sumur X-2 dilakukan pada kedalaman 2241,2-5100 ft. Densitas bubuk semen adalah 10 lb/gal dengan ECD maksimal sebesar 10,45 lb/gal. Komposisi bubuk semen untuk operasi penyemenan di sumur X adalah 212.5 sak semen kelas A, 501.47 sak *sodium silicate*, 501.47 sak *nut plug*, 22.58 bbl *anti-foam*, dan 210.37 bbl air. Operasi MPC pada sumur X-2 dilakukan dengan *landing casing* 9-5/8", sirkulasi, kemudian penyemenan casing 9-5/8" yang diawali dengan memompa 40 bbl *spacer* 9.5 ppg, kemudian 250,2 bbl bubuk semen 10 ppg dan *displace* semen dengan 10.5 ppg *displacement fluid* sebanyak 371,53 bbl menggunakan kecepatan pompa 4 bpm. Terakhir, aplikasikan *surface back pressure* sebesar 100 psi saat pompa mati atau saat WOC. Berdasarkan desain yang dibuat, dapat diambil kesimpulan bahwa operasi penyemenan dapat dilakukan dengan aman menggunakan metode *managed pressure cementing*.

Kata kunci: *managed pressure cementing*, margin PPFG yang sempit

## **ABSTRACT**

### ***CEMENTING DESIGN OF WELL X-2 USING MANAGED PRESSURE CEMENTING METHOD BASED ON ADJACENT WELL DATA***

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*Well X-2 is an infill well which will be drilled to a depth of 5100 ft. Based on PPFG graph data from the adjacent well, namely Well X-1, it can be seen that at a depth of 2361 - 2366 ft shows a narrow margin PPFG between pore pressure (10.26 lb/gal) and formation fracture pressure (10.83 lb/gal) resulting in loss & kick problems in Well X-1. The cementing operation is planned using a managed pressure cementing technique which the cementing works are designed with lower density spacers & cement slurry while applying SBP through MPD settings.*

*Cementing planning begins by collecting data such as geological data, potential drilling hazard, pressure data and well trajectory taken from adjacent wells, namely Well X-1. The cementing designs discussed include 9-5/8" casing cementing planning and describe the MPC operation plan for Well X-2, especially for the 9-5/8" casing cementing operation.*

*The cementing process for the 9-5/8" casing in Well X-2 will be carried out from 2241.2 - 5100 ft. The cement slurry density is 10 lb/gal with a maximum ECD of 10.45 lb/gal. The cement slurry composition for managed pressure cementing operations in Well X-2 are 212.5 sack cement class A, 501.47 sack sodium silicate, 501.47 sack nut plug, 22.58 bbl anti-foam, and 210.37 bbl water. Managed pressure cementing operations on Well X-2 are carried out by landing 9-5/8", circulation, then cementing the 9-5/8" casing starting with pumping 40 bbl 9.5 ppg spacer, then 250.2 bbl 10 ppg cement slurry and displace cement using 371.53 bbl 10.5 ppg displacement fluid using a pump rate of 4 bpm. Finally, apply 100 psi surface back pressure when the pump is off or during WOC. Based on the design made, it can be concluded that cementing operations can be carried out safely using the managed pressure cementing method.*

*Keywords: managed pressure cementing, narrow margin PPFG*