



DEEP WATER



MATURE FIELDS



UNCONVENTIONALS

Swellpacker® System Enables Complete Zonal Isolation During Well Construction

ISOLATION SOLUTION REDUCES TIME AND RISK FOR OPERATOR

AUSTRALIA

CHALLENGE

- » Provide zonal isolation between production zones and a nearby water zone to avoid potential communication between the zones during the life of the well

SOLUTION

- » Swellpacker® HS isolation system to prevent a mud channel from creating a potential leak path

RESULTS

- » Swellpacker HS system was successfully run in hole without the need for special setting tools, procedures, or personnel
- » Cement job was pumped as per design
- » Circulating pressure stayed below the fracture pressure over the length of the job
- » Complete zonal isolation was achieved

OVERVIEW

A major operator in Australia wanted to ensure complete zonal isolation between production zones and a nearby water zone to avoid potential communication between the zones during the life of the well. An equivalent circulating density (ECD) analysis to determine the maximum allowable outside diameter (OD) of the tool during the cement job was carried out. Lab testing was then conducted to tailor the packer design to the needs of the well. The Swellpacker® hybrid-swelling (HS) isolation system was run as part of the tool string, and the cement job was pumped as per design. The Swellpacker isolation system did not significantly increase ECD during the job, and zonal isolation was achieved.

CHALLENGE

Two different fluid types were present in the well: synthetic-based mud (SBM) when running in hole, and water once the well was producing. To cure a potential mud channel after the cement job, the Swellpacker system needed to be able to swell in either of those fluids. Additionally, the OD of the packer could not exceed certain limitations in order to help ensure that the cement job was not negatively impacted.

SOLUTION

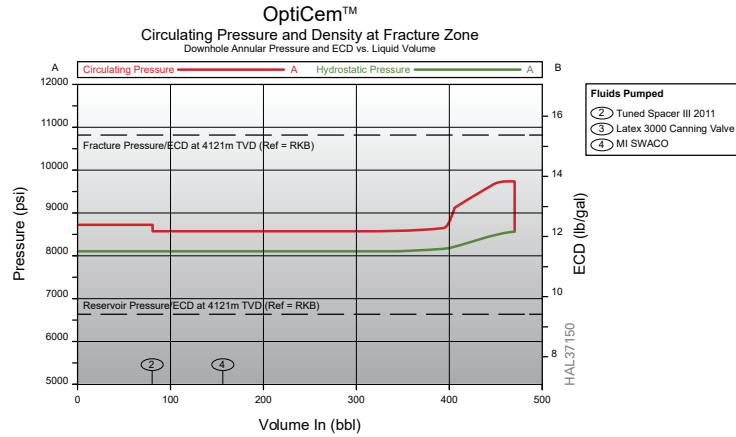
Halliburton recommended cementing a Swellpacker HS isolation system in the well to help prevent a mud channel from creating a potential leak path. The Swellpacker system had the ability to swell in the SBM – and also in produced water, should that fluid enter the annulus during the life of the well.

An ECD analysis was performed to determine the tool’s maximum allowable OD during the cement job. Lab testing was then conducted to tailor the packer design to the operator’s needs.

RESULTS

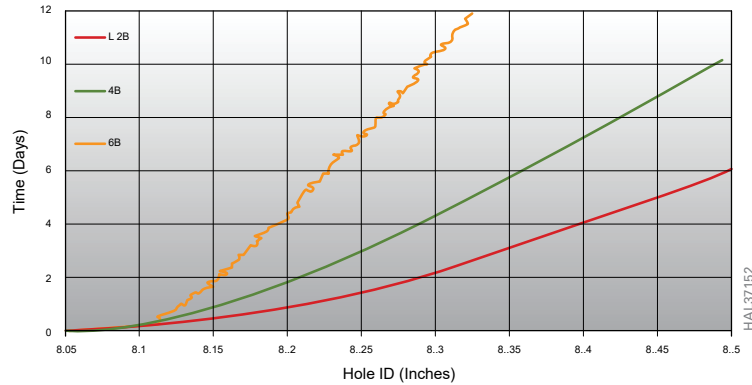
The Swellpacker HS system directly bonded to the 7-inch production liner and was successfully run in hole without the need for special setting tools, procedures, or personnel – thus reducing time and risk for the operator. The cement job was pumped as per design, and the Swellpacker system did not significantly increase ECD rates during the job.

Using OptiCem™ software, the Halliburton Cementing team analyzed the operation’s ECD and established a maximum tool OD at the time of the cement job to avoid inducing losses while pumping the cement. Circulating pressure stayed below the fracture pressure over the length of the job.



This plot shows the ECD of the job with the packer in place, confirming that circulating pressure stayed below the fracture pressure over the length of the job.

Lab testing optimized the packer’s delay system to help ensure that the tool’s OD was within the set limits and would still allow the packer element to swell in the wellbore fluids. Testing in the actual base oil for the SBM was carried out at several temperatures, simulating circulation in the well prior to and during the cement job.



This graph shows the swell curves for the various delay systems at one of the test temperatures.

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