



ORCA™ Breaker Fluid successfully removes filter cake generated by WBM RDF in new water injector wells offshore Australia

Well Injectivity tests confirmed that the engineered solution far exceeded the operator's expectations for removing filter cake.

CHALLENGE	SOLUTION	RESULT
<ul style="list-style-type: none"> Remove filter cake damage generated by WBM RDF in new water injector wells without backflowing wells before water injection 	<ul style="list-style-type: none"> ORCA™ for WBM Breaker Fluid technology based on organic acid precursors and polymer breaking enzymes 	<ul style="list-style-type: none"> Injection rate being reported as >350% of what was required

OVERVIEW

A major operator in Australia successfully drilled and completed a campaign of 12 offshore wells in water depths of +/- 850 to 1,000 m including six water injector wells.

The horizontal water injectors were drilled with WBM RDF, base brine with 46 ppb CaCO₃ for density control, as 8 ½" open hole intervals ranging from +/- 400 m to 2,000m long. The shallower reservoir had a BHST of 57°C and the deeper reservoir a BHST of 88°C.

The operator required a technology to efficiently remove the filter cake generated by RDF.

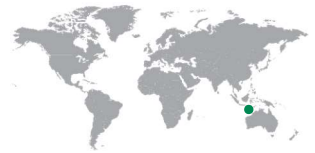
CHALLENGE

The reference case sand-face completion installation in the water injectors consisted of:

- Condition the wellbore and displace to solid-free fluid
- Run stand-alone screens with internal wash pipe
- Set the packer and release service tool
- Displace open hole to a delayed filter cake breaker
- POOH and close the fluid loss device, allowing a soak time
- When ready, start water injection without backflowing wells

A key risk identified by the operator was the loss of the primary well control while pulling the internal wash pipe after displacing a delayed filter cake breaker into the open hole.

To ameliorate this risk, the ORCA for WBM filter cake breaker formulation had to be designed to delay the dissolution of the filter cake for 5 to 15 hours depending on the length of interval drilled, and the anticipated bottom hole temperature.



Other considerations on the Filter Cake Breaker were:

- No flow-back facility was available on the rig; no well clean-up was possible before water-injection tests were completed, therefore.
- There was no rig-based injection equipment, so a break had to occur with less than 50 psi.
- Matrix injection across the entire interval was critical to ensure the reservoir was swept efficiently toward the producer wells.

SOLUTION

The operator's completions team specified ORCA for WBM breaker treatments to remove WBM drilling damage in the new water injection wells.

After extensive laboratory testing, the final ORCA for WBM breaker design by Newpark was based on the following formulation:

- Base brine for density
- Liquid organic acid precursor
- GBC-1- liquid catalyst to accelerate the rate of acid production and buffer initial fluid pH
- LyoZan-liquid xanthan breaker enzyme
- LyoStar-liquid starch breaker enzyme

All these products have CEFAS – OCNS Gold band status with no substitution warnings.

RESULTS

After the ORCA breaker treatment on the first injector well, a "Well Injectivity" test was completed, and the results exceeded the operator expectations. The matrix injection rate was calculated as >350% of what the operator required to qualify as a successful treatment.

All six water injectors were displaced to the planned volumes of ORCA for WBM filter cake breaker fluid with equal success, confirmed by two further "Well Injectivity" tests.