

BaraBlend®-657 and BARAFLAKE® C LCM Combo Reduces Static Loss Rate to Zero

PRUDHOE BAY, ALASKA

CHALLENGE

An operator needed to control an unexpected loss zone that was recording static losses of up to 600 bph. This condition put the well on a strong vacuum, and required all downhole operations to be halted until a solution could be implemented.

SOLUTION

Pumping two consecutive BaraBlend®-657/BARAFLAKE® C LCM pills reduced static losses to zero.

RESULT

The operator was able to perform a cement squeeze and to sidetrack the well with no further disruptions.

OVERVIEW

An operator in Prudhoe Bay, Alaska, encountered severe downhole losses while drilling an 8-1/2-inch intermediate interval. Although no faults or fractures were mapped in the seismic profile, it was evident that the wellbore was following the plane of a loss zone. The high loss rate was also indicative that the fractures were significantly larger than what is normally encountered in this field.

Losses recurred after every attempt to drill ahead, and static losses of 600 bph were recorded.

The well was on a strong vacuum. This condition had to be controlled before a remedial plan could be put in place.

Pumping a conventional lost circulation material (LCM) pill (Pill 1) in a successive fashion into the loss zone through a circulating sub delivered only temporary loss abatement (see formulations and outcomes in the tables below).

LCM COMBO TARGETS LARGE FRACTURES, BRINGS LOSS RATE TO ZERO

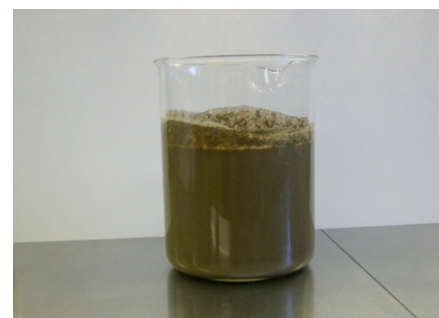
Baroid personnel proposed a combination of BaraBlend®-657 premium, coarse-sized acid-soluble multi-modal LCM supplemented with BARAFLAKE® C (coarse) LCM. Laboratory analysis was performed to test the proposed formulation and its pumpability in a 10.5-ppg low-solids non-dispersed (LSND) drilling fluid.

A BaraBlend-657/BARAFLAKE C pill (Pill 2) containing 120-ppb LCM was pumped, which reduced the static loss rate to 72 bph.

This treatment was followed by a second BaraBlend-657/BARAFLAKE C pill, which reduced static losses to zero and allowed essential operations to take place with no further disruptions.

BaraBlend-657 LCM is a single-sack combination of particulate sizes and types, designed specifically to help stop lost circulation by quickly sealing fractures up to 3,000 microns in width. When supplemented with BARAFLAKE C LCM, it has proven to seal holes up to 0.5 inch in size.

BARAFLAKE sized calcium carbonate chips, available in medium and coarse particle sizes, offer better resistance to particle size reduction while drilling compared to flake-like calcium carbonate.



LCM pill formulation tested for suspension and pumpability – Pilot testing showed no LCM settling after 45 minutes when mixed in standard 10.5-ppg LSND drilling fluid, and no pumpability issues were expected when using a circulating sub.

It was critical to minimize any further nonproductive time in a timely manner.

LCM Pill 1 vs. Pill 2: Impact on Static Loss Rate

LCM Pill Sequence	Static Loss Rate (bph)	
	Initial	Final
40-ppb/80-ppb conventional pills pumped during attempts to resume drilling	Varied	600
110-bbl LCM Pill 1	600	185, then increased to 550
50-bbl LCM Pill 1	550	175
50-bbl BaraBlend®-657/BARAFLAKE® C Pill 2	175	72
80-bbl BaraBlend-657/BARAFLAKE® C Pill 2	72	0

LCM Pill 1 vs. Pill 2: Type and Concentration of LCM Used in Formulations

Pill 1		Pill 2	
BARACARB® ground marble (particle size)	Concentration (ppb)	BaraBlend®-657 coarse acid-soluble LCM BARAFLAKE® sized calcium carbonate chips	Concentration (ppb)
1,200	15	BaraBlend-657	80
600	15	BARAFLAKE C	40
400	15		
150	15		
50	10		
25	10		
Total	80	Total	120

WELL SUCCESSFULLY CEMENTED AND SIDETRACKED AFTER SPOTTING TWO PILLS

When the BaraBlend-657/BARAFLAKE C pills stopped the static losses, the operator was able to trip and perform a cement squeeze job. The wellbore was successfully abandoned and a sidetrack was then drilled.

Drilling fluid costs were as high as USD 45,000 per hour while the well was on vacuum, and the rig rate was nearly USD 350,000 per day. It was critical to minimize any further nonproductive time in a timely manner.

Final resolution of the issue was only seen after pumping pills containing a combination of BaraBlend-657 and BARAFLAKE C LCM. These customized LCM pills stopped the losses, thus enabling the operator to continue well operations.

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