

Lemongrass fiber as lost circulation material in drilling fluid

August 15 2014

Universiti Teknologi MARA researchers are investigating the properties of lemongrass fibers to help prevent fluid circulation problems while drilling for oil and gas.

In the [oil and gas industry](#), drilling mud is used to (1) to suspend cuttings to prevent it sagging at the [drill bit](#) during shutdown, (2) to transport it to the surface, (3) to cool and lubricate the drill bit, (4) to provide enough hydrostatics pressure to prevent fluids from formation enter to the well bore and (5) to form a thin filter cake to seal the damage formation.

One of the biggest problems encountered during drilling is when the smaller particles of the drilling fluid break through into the larger void spaces in the formation, which leads to lost circulation. Lost circulation can result in blow-outs, stuck pipe, lost rig time and the leasing of wells, costing millions of dollars.

Lost circulation materials (LCM) are drilling fluid additives that are designed to make sure that the drilling fluid circulates down the hole and returns to the surface for recirculation rather than being lost to the formation drilled. There is a wide range of LCM that is currently being applied, depending on the viability of materials and loss rates - ranging from particles, flakes and cement gunk to chemical sealants. LCM selection is usually based on cost, nature of losses, types of [drilling fluid](#) being used and sometimes on the type of formations being drilled

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of lemongrass to be used as LCM.

These days, it is increasingly necessary to drill in ultra-deep waters, which entails working in high temperature and pressure conditions. Here Oil based mud (OBM) is the more preferred medium to use compared to water based mud.

Therefore, a laboratory study was carried out to investigate the effect of temperature on the performance of lemongrass with different sizes of LCM in oil based mud.

It was found that different temperatures and sizes have great effects on the lemongrass LCM in the oil based mud. The optimum temperature for lemongrass LCM is 275 degrees Fahrenheit with the sizes of 250 microns.

Based on the result, it shows that lemongrass is able to perform a good LCM in OBM based on filtrate volume and filter cake thickness. The thickness of the filter cake obtained was in the range of 2 to 25 mm which satisfies the requirement from industry.

The findings also discovered that the lemongrass with the size of 150 microns is the suitable material to be used as LCM to replace conventional LCM.

Provided by Universiti Teknologi MARA (UiTM)

Citation: Lemongrass fiber as lost circulation material in drilling fluid (2014, August 15) retrieved 25 April 2024 from

<https://phys.org/news/2014-08-lemongrass-fiber-lost-circulation-material.html>

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